Lake Lou Yaeger
Aquatic Ecosystem Restoration Project
Continuing Authorities Program, Section 206

City of Litchfield
Montgomery County, Illinois

Final Feasibility Report
with
Integrated Environmental Assessment and FONSI

St. Louis District
February 2017

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(*Sections required by NEPA)

EXECUTIVE SUMMARY

The Lake Lou Yaeger, Litchfield, IL study was conducted under the authority of Section 206 of the Water Resources Development Act of 1996 (Public Law 104-303), as amended, which authorizes the Secretary of the Army to carry out a program of aquatic ecosystem restoration for projects of relatively smaller scope, cost and complexity. Lake Lou Yaeger is located just northeast of the City of Litchfield in Montgomery County, Illinois. The lake provides public access for fishing, boating, swimming and camping.

The lake is experiencing degradation of its aquatic ecosystem habitat due to sediment contributions from the surrounding watersheds, as well as wind and ice-induced bank erosion. To potentially address these problems, the study developed an array of measures with the objectives of restoring herbaceous emergent wetlands and improving habitat for aquatic organisms. While developing and evaluating these measures, the study sought to avoid impacts to the dam and water supply intake, as well as avoiding or minimizing impacts to private landowners and recreation activities. The study examined sediment control measures (retention basins and strategic lake drawdowns), shoreline protection measures (revetment and breakwaters), and in-lake structure measures (plantings and fish habitat).

After careful consideration of all of the potential measures, the study screened out measures that had high long-term maintenance costs, were inefficient (high cost with low benefits), were ineffective, or had potential for induced flooding, recreation impacts or environmental impacts. This screening reduced the measures down to one: In-lake sediment retention basins. Four locations were considered initially but only two were found to be effective enough to be examined in detail. Both alternatives consisted of an in-lake rock structure (berm) which would retain sediment entering the northern part of the lake, thereby restoring wetlands upstream of the structure and improving aquatic habitat downstream of the structure. The primary physical differences between the two alternatives were the specific locations and the amount of material required to build the rock berm.

Both alternatives are located at relatively narrow parts of the lake, downstream of the confluence of the Shop Creek and Shoal Creek. In both alternatives, a rock berm would be constructed between the east and west banks of the lake. The initial design calls for the top of the berm to be 6 inches below the height of the spillway crest. Preliminary hydraulic analysis indicates that this does not significantly increase lake water surface elevations for flows up through 20,000 cubic feet per second (approximately a 1% chance recurrence 48-hour rainfall event). Any potential rise in the water surface elevation is projected to be very small and to occur within the boundary of the land owned by the City. After construction, in order to avoid destruction of the restored wetland vegetation, motorized boats would not be permitted upstream of the berm.

Habitat models were used to calculate the benefits of each alternative. These benefits were compared to the costs of each alternative and the most cost-effective alternative was identified as the recommended plan. Alternative 1a is the recommended plan and includes restoration of 32 acres of emergent wetland upstream of the berm while also restoring habitat for aquatic species downstream of the berm. This plan also includes a Monitoring and Adaptive Management Plan,

which includes monitoring of the project for five years after construction and possible corrective actions if the projected outputs are not being achieved. The estimated total first cost of the recommended plan is $1,032,000 and it is anticipated to yield 127 net average annual Habitat Units (HU). Using the Fiscal Year 2017 Federal discount rate of 2.875%, this results in an average annual cost of $322 per HU over the 50-year period of analysis.

The required cost sharing for implementation of a Section 206 project is 65% Federal and 35% non-Federal. The sponsor is the City of Litchfield, IL. With a total project first cost of $1,032,000, repayment of pre-FCSA costs in the Federal amount of $44,600, and monitoring and adaptive management costs of $21,700, the City's share of the implementation cost is $413,400 and the Federal 65% share is $640,300. A portion of the City's share would be credit for acquisition of permanent easements, currently estimated to be $106,000. The remainder of the City's share ($307,400) will be contributed in cash or in-kind services.

Lake Lou Yaeger, Litchfield, IL
Section 206 – Aquatic Ecosystem Restoration
Final Feasibility Report with Integrated Environmental Assessment

1. INTRODUCTION*

1.1. Purpose

The Lake Lou Yaeger, Litchfield, IL Project (Project) is currently completing a Feasibility-level study in the Continuing Authorities Program (CAP) for the purpose of aquatic ecosystem restoration. The non-Federal Sponsor (NFS) is the City of Litchfield which owns and operates Lake Lou Yaeger. The purpose of the report is to present the results of an evaluation of alternatives for aquatic ecosystem restoration within the lake. Following approval of the Report, the next steps include updating the Project Management Plan for the design and construction phase and signing of a Project Partnership Agreement for the cost sharing of the design and construction.

1.2. Authority and Scope

Section 206 of the Water Resources Development Act of 1996 (Public Law 104-303), as amended, authorizes the Secretary of the Army to carry out a program of aquatic ecosystem restoration for projects of relatively smaller scope, cost and complexity. Unlike the traditional Corps of Engineers (Corps) civil works projects that are of wider scope and complexity, the Continuing Authorities Program is a delegated authority to plan, design, and construct certain types of water resource and environmental restoration projects without project-specific Congressional authorization.

The study will consider opportunities to address aquatic ecosystem degradation in the lake and evaluate potential actions that would restore degraded ecosystem structure, function, and dynamic processes in ways that are in the public interest and are cost effective.

1.3. Location

Lake Lou Yaeger (approximately 1,300-acres) is located just northeast of the City of Litchfield in Montgomery County, Illinois. It is 48 miles northeast of St. Louis, Missouri and 37 miles south of Springfield, Illinois (See Figure 1.1).

The lake was built in 1966 under the Watershed Protection and Flood Prevention Act (Public Law 83-566, 1954, as amended) program for water supply, flood control, and recreation. The lake provides public access for fishing, boating, swimming and camping.

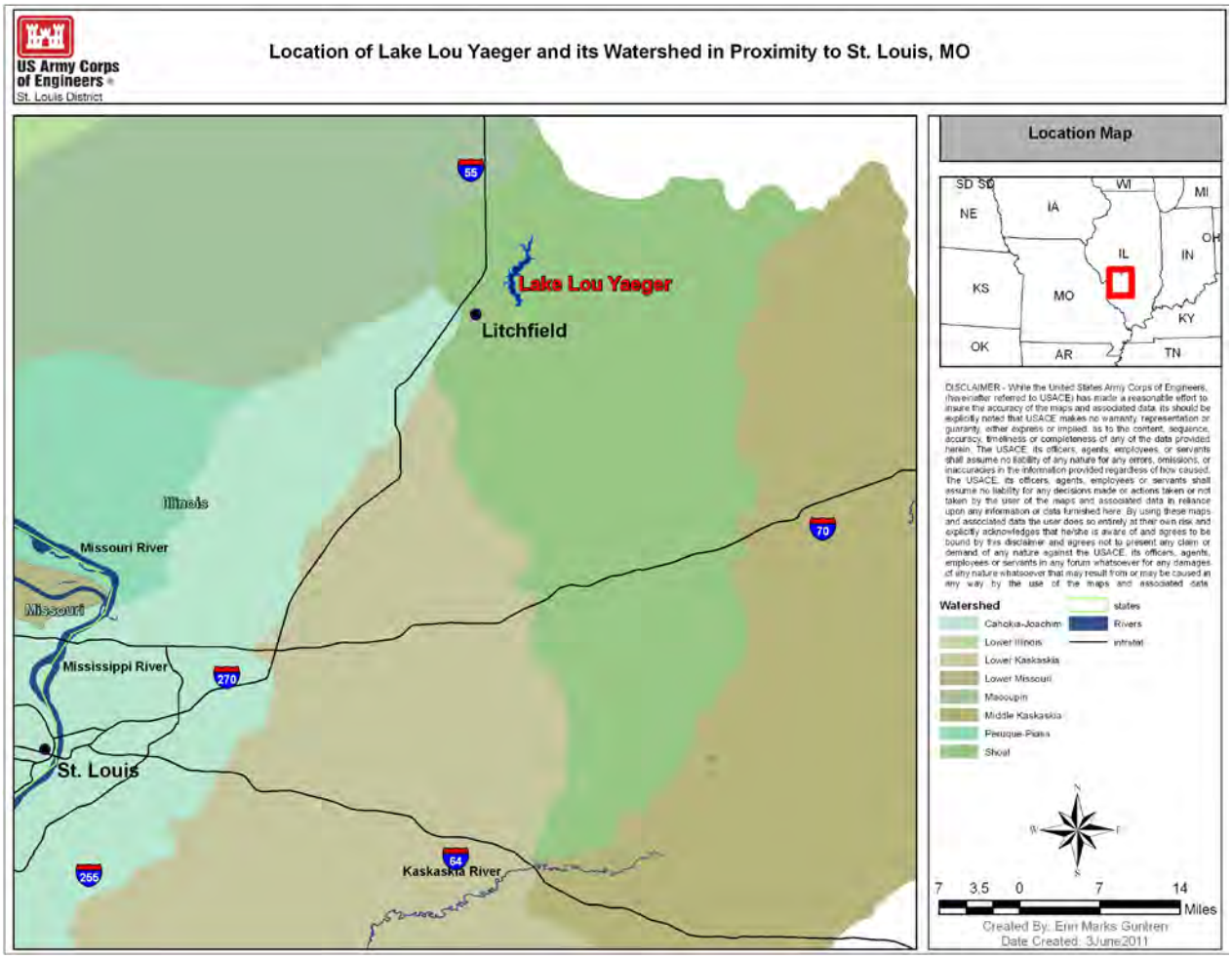

Figure 1.1 Study Location

1.4. Study Process and Report Format

Development of the feasibility study followed the Corps of Engineers' six-step planning process specified in Engineer Regulation (ER) 1105-2-100. The process identifies and responds to problems and opportunities associated with the Federal objective and specified non-Federal concerns. The process provides a flexible, systematic, and rational framework to make determinations and decisions at each step. This allows the interested public and decision makers to be fully aware of the basic assumptions employed; the data and information analyzed; the areas of risk and uncertainty; and the significant implications of each alternative plan.

As part of identifying the Recommended Plan, a number of alternative plans are developed and compared with the "No Action" alternative, allowing for the ultimate identification of the National Ecosystem Restoration (NER) Plan. The NER plan reasonably maximizes ecosystem restoration benefits compared to costs, consistent with the Federal objective, considering the cost effectiveness and incremental cost of implementing other restoration options. In addition to considering the system benefits and costs, the process leading to the identification of the recommended plan considered information that cannot be quantified, such as environmental significance and scarcity, socioeconomic impacts, and historic properties information.

The steps used in the plan formulation process are outlined as follows:

1. Identify Problems and Opportunities. The specific problems and opportunities are identified, and the causes of the problems discussed and documented. Specific goals and objectives to solve the identified problems are outlined.

2. Inventory and Forecast Resource Conditions. This step characterizes and assesses existing conditions in the Project area and forecasts the most probable *without-project condition*, also known as the *No Action Alternative*, over the period of analysis. The without-project condition describes the area and its uses as anticipated over a 50-year period of analysis without any restoration implemented as a result of this study, taking into account reasonable foreseeable actions of others. The with-project condition describes the area and its uses as anticipated if restoration measures are implemented by the Corps. This assessment gives the basis by which to compare various alternative plans and their impacts.

3. Formulate Alternative Plans. Potential features are proposed to meet the identified objectives. Specific design measures are developed for these features. These measures are combined into alternative plans in a systematic manner to ensure that reasonable alternatives are evaluated.

4. Evaluate Alternative Plans. The evaluation of each alternative consists of measuring or estimating the environmental benefits, costs, technical considerations, and social and economic effects of each plan, and determining the difference between the without- and with-project conditions. A key measure for evaluation of alternative plans is a cost-effectiveness incremental cost analysis and evaluation of significance.

5. Compare Alternative Plans. Alternative plans are compared, focusing on the differences among the plans identified in the evaluation phase and public comment. As part of the evaluations, the *Best Buy* plans—those plans that provide the greatest increase in benefits for the least increase in cost—are identified.

6. Select Recommended Plan. A Recommended Plan, or NER Plan, is selected. If a viable plan is not identified, the recommended plan will be the No Action Alternative. In most cases, the NER Plan will be selected from among the Best Buy plans based on an evaluation of acceptability, completeness, effectiveness, efficiency and reasonableness of costs. The recommended plan will be selected after considering public comments received during a public review period.

The Report is organized to follow the planning process and therefore does not follow exactly the planning steps as they occurred. The planning process is iterative. As such, as additional information was learned in subsequent steps, it was necessary to revisit and repeat portions of the previous step(s).

1.5. Related Studies and Reports

Lake Lou Yaeger, IL, Wetland Restoration Projects, Federal Interest Determination (USACE, 2012).
This report is the first product in a Section 206 study. It presents an initial analysis of the ecosystem restoration problems and opportunities and recommended further study.

Lake Lou Yaeger Resource Plan (Natural Resources Conservation Service, 2001)
The Lake Lou Yaeger Watershed Committee, in cooperation with the Montgomery County Soil and Water Conservation District and the USDA Natural Resources Conservation Service, prepared a watershed plan for the City of Litchfield, Illinois. The purpose of the plan was to define the existing and future needs of the watershed and lake, to identify a set of alternatives to address those needs, and to encourage joint public and private action to implement the alternatives.

Kaskaskia River Basin, IL, Ecosystem Restoration Project, General Investigations Study (USACE, ongoing).
This study is currently evaluating the ecosystem restoration problems and opportunities of the Kaskaskia Watershed. The study area encompasses the Lake Lou Yaeger project area.

2. ASSESSMENT OF EXISTING RESOURCES*

Chapter 2 assesses the existing conditions of resources within the project area and is organized by resource topic. This is not a comprehensive discussion of every resource within the project area, but rather focuses on those aspects of the environment that were identified as relevant issues during scoping or may be affected by the alternatives. The environmental consequences on these resources are described in Chapter 9.

2.1. Existing Features.

Lake Lou Yaeger was created by damming the West Fork of Shoal Creek, creating an impoundment approximately 8 miles long. The lake was constructed in 1964, and reached normal impoundment water levels during May of 1966. The predominant uses of this lake are public water supply, boating recreation, sport fishing, and flood control. Buffer lands surrounding the lake are primarily upland forest habitat. In general, marginal lands bordering the lower portion of the lake, and the western shoreline, are more developed and have more permanent recreational facilities, than marginal lands in the upper portions of the lake or along the eastern shoreline.

2.2. Hydraulic and Hydrologic Conditions

Lake Lou Yaeger collects drainage from approximately 74,550 total acres. The upper end of Lake Lou Yaeger is fed by three main tributaries: Blue Grass Creek, Shoal Creek, and Shop Creek (formally Shoal Creek No 2 and consisting of 3 parts, Shop Creek, Five Mile Lake and Three Mile Creek), which together total approximately 59,392 acres. Shop Creek flows into Five Mile Lake, an existing retention feature located approximately 1.4 miles upstream from Lake

Lou Yaeger. Three Mile Creek flows into the lower end of Five Mile Lake and is the name of the portion of the waterway between Five Mile Lake and Lake Lou Yaeger. However, for this study's purposes, calculations were based on Shop Creek, Five Mile Lake and Three Mile Creek as one waterway and referred to as Shop Creek. Five Mile Lake was constructed in 1966, the same year as Lake Lou Yaeger, but is considered effectively full of sediment at this time and is no longer functioning as a sediment retention basin. The relationships of these three watersheds, as well as their sizes can be seen in Figure 2.1 and Table 2.1, respectively.

Table 2.1: The areas of the respective watersheds that were analyzed.

Watershed name	Area (acres)
Shoal Creek	19,756
Blue Grass Creek	15,188
Shop Creek	24,448

Past sediment deposition in the lake (location and magnitude) was estimated using the 2011 hydrosurvey, 1966 topographic survey, Natural Resources Conservation Service (NRCS) average annual sediment yield values for both Blue Grass Creek and the Upper West Fork of Shoal Creek watersheds, and average annual sediment yield value for Shop Creek from the "Restoration Plan for Lake Lou Yaeger" (January 1995). Additionally, based upon historical aerial photography from Google Earth, the upper (northern) section of Lake Lou Yeager has been relatively shallow over the last decade.

An Isopach analysis, which is the comparison of 2 surveys, was done to generate a sedimentation volume between the 2011 hydrosurvey and the old pre-1964 topographic map (which was digitized in Arc-GIS). The input data and results are seen in Figures 2.2 (the pre-1964 topography), 2.3 (the 2011 hydrosurvey) and 2.4 (the Isopach). The pre-1964 topographic map was a survey from before Lake Lou Yaeger was created. A positive number (yellow to brown) indicates an increase in bed elevation, a negative number (blue to purple) indicates a decrease in bed elevation.

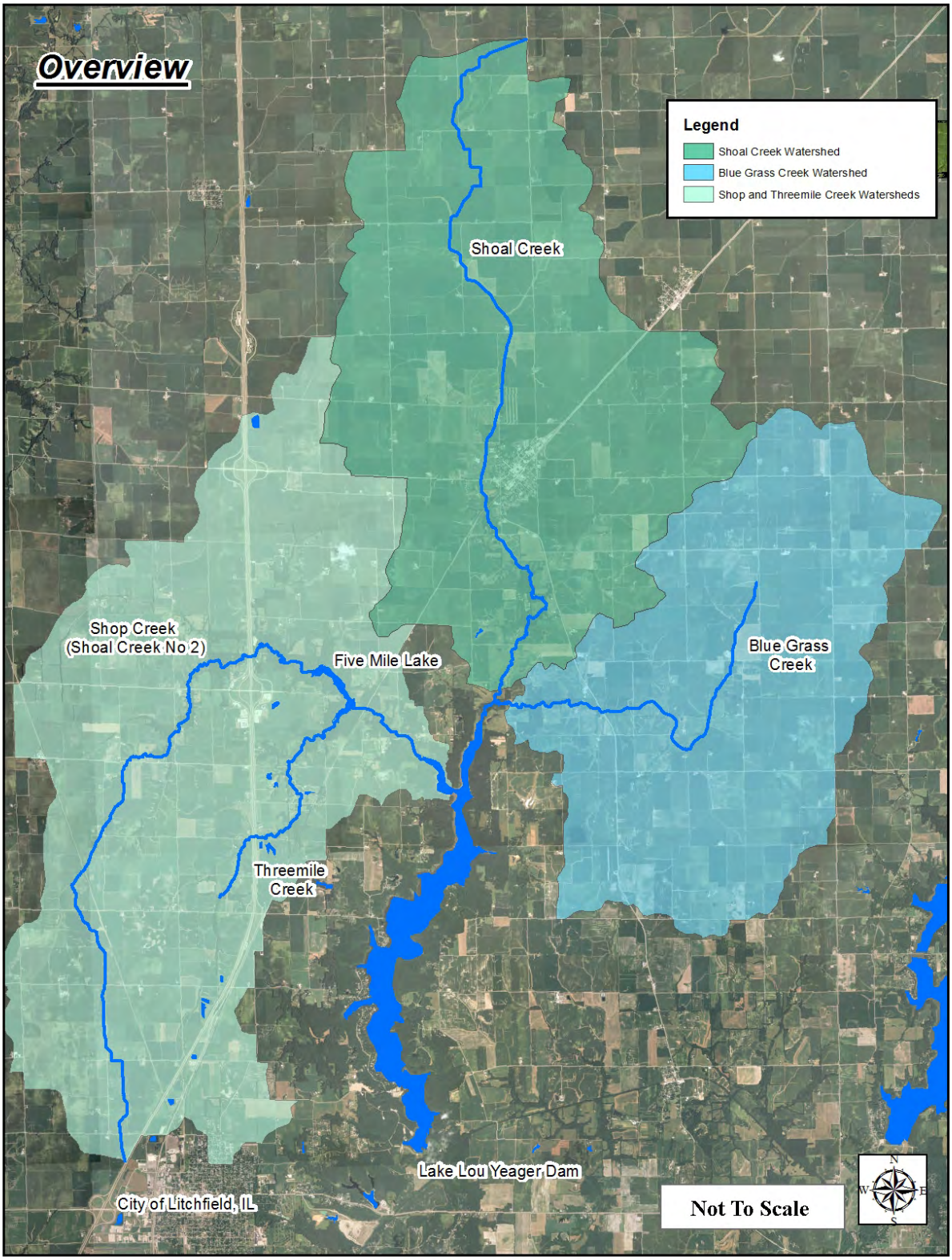

Figure 2.1. The three primary watersheds analyzed for the study.

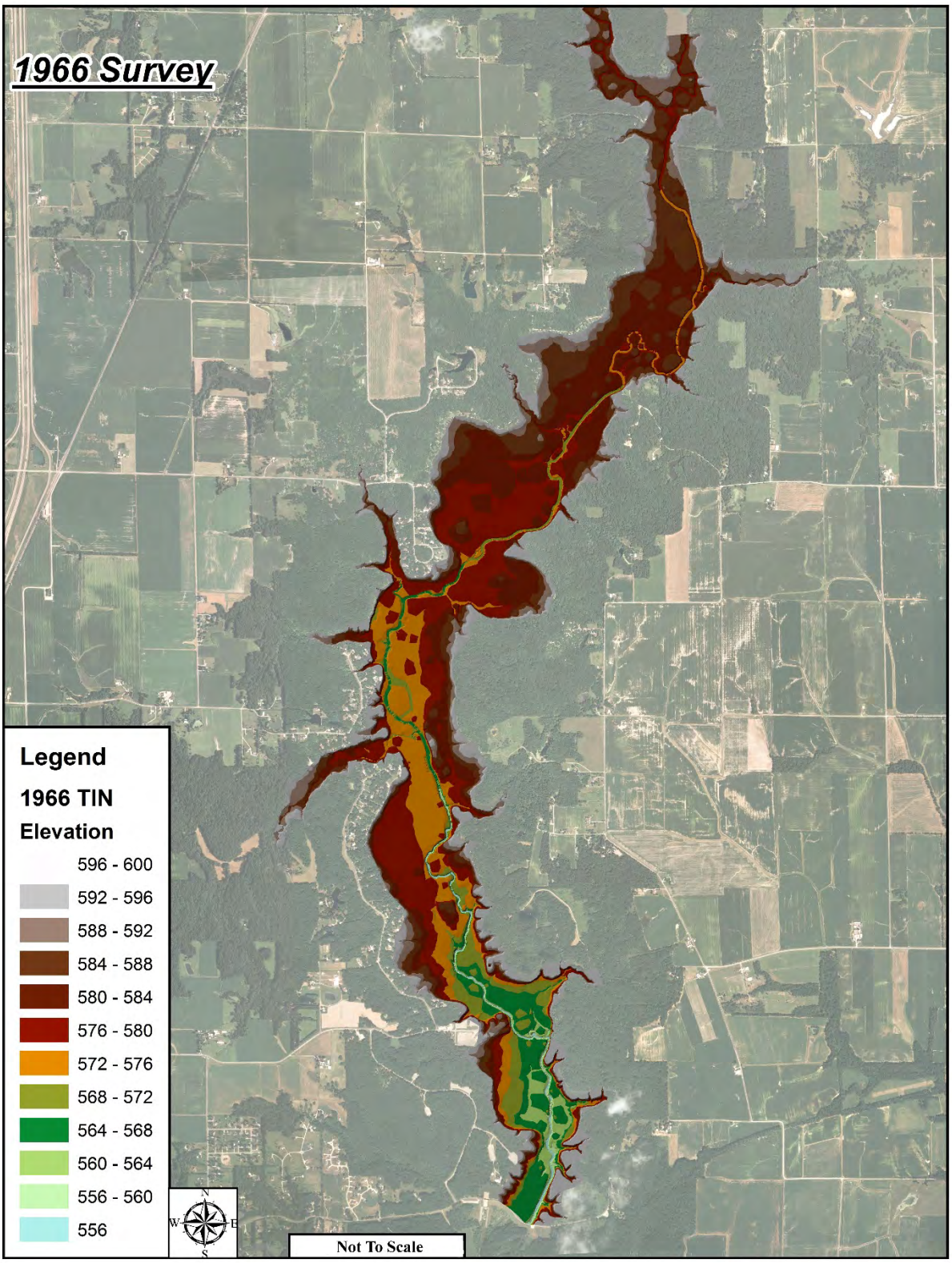

Figure 2.2: 1966 Survey of the Lake Lou Yaeger basin before the reservoir was filled

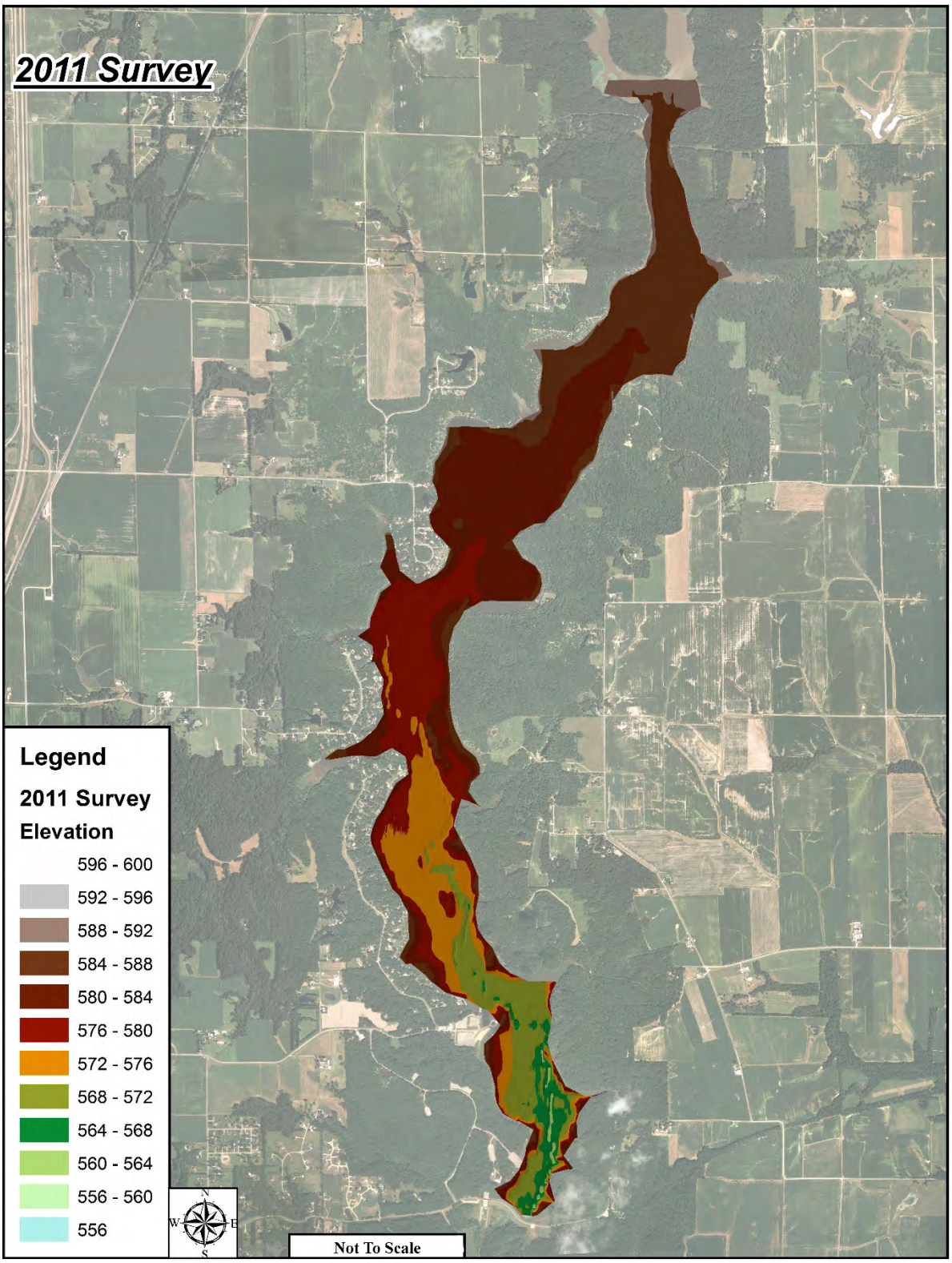

Figure 2.3: 2011 Bathymetric survey

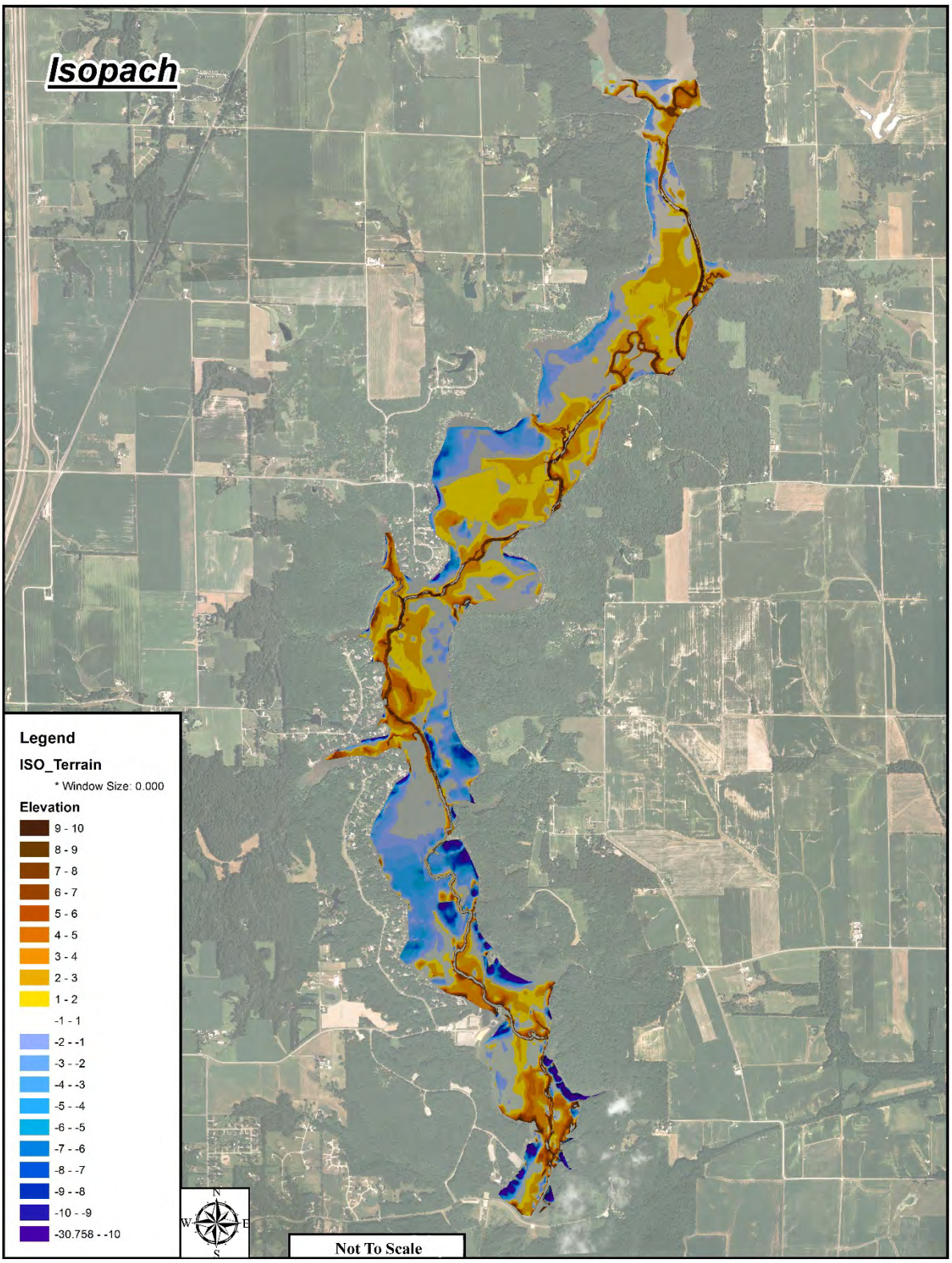

Figure 2.4: Isopach analysis comparing the 1966 and 2011 surveys

In Figure 2.4, the analysis shows areas of shallowing (positive numbers) and deepening (negative numbers) with the legend indicating the amount of change, in feet. From this figure, we can ascertain where the most sediment deposition has occurred, creating shallower and deeper areas in the lake.

2.3. **Historic and Cultural Resources**

The project area is situated within the Prairie Peninsula environment of central Illinois. The Prairie Peninsula consisted of extensive prairies on flat upland landforms and narrow strips of woodland along stream valleys. Most prehistoric settlement in the eastern Prairie Peninsula focused on the forested river valleys. The largest and most complex settlements were located in and along major valleys, and site densities appear to be highest there as well.

From 1974 to 1977 the panhandle of Montgomery County, directly north of the project area, was systematically sample-surveyed for archaeological sites by a team from Northwestern University (Asch 1978). The survey was a stratified probabilistic sample that covered 13.7 km^2 or 4% of the study area. This data was later incorporated with GIS to create a high resolution predictive model of prehistoric archaeological site location in a poorly drained upland prairie region of central Illinois (Warren and Asch 2000). The findings of this study were that prehistoric inhabitants most likely had a bimodal settlement pattern in which prehistoric hunter-gathers focused their activities on both valleys and upland knolls. It would appear that prehistoric land-use strategies in this area were geared toward two sets of resources: (1) aquatic-riparian resources that were concentrated along upland stream courses, and (2) prairie or forest resources that were broadly dispersed across the glaciated uplands. The different modes of settlement could have a seasonal dimension in which valley resources were exploited at one time of year and upland resources at another. This would indicate that the location of Lake Lou Yaeger project area falls within a high probability area for prehistoric settlements.

In 1964, in anticipation of the construction of the Litchfield Reservoir (Lake Lou Yaeger) an archeological survey was undertaken by Don Henson of Southern Illinois University. Based on Illinois Archaeological Survey site forms this survey identified six prehistoric archaeological sites (11MY41–11MY46) that have since been inundated by the creation of the lake. Five of these sites have been identified as Archaic village sites, one of which also has a possible Mississippian component. The sixth site is a mound site that has not been assigned to a cultural period. None of these properties were evaluated for National Register eligibility. Six additional sites (11MY16, 11MY24, 11MY25, 11MY160, 11MY161, 11MY162) have been identified in the vicinity of Lake Lou Yaeger - two prehistoric and four historic. Four of the sites have been determined not eligible for the National Register while no determination has been made for the remaining two.

The Illinois Historic Preservation Agency has identified four archaeological surveys in the immediate vicinity of Lake Lou Yaeger. In 1997 and in 2005, archaeological surveys for the construction of waterlines on either side of Lake Lou Yaeger were undertaken (Burns 1997 and Burrows 2005). In 1994, an archaeological survey for a proposed golf club was completed at the southern end of the lake adjacent to the dam and spillway (Halpin 1994). Most recently in 2012,

a Phase I archaeological survey was completed for a proposed horse campground at Lake Lou Yaeger.

2.4. **Natural Resources.**

Principal natural resources in the immediate study area are the forested lands and open waters of Lake Lou Yaeger. While much of the land buffering the reservoir is forested, the remainder of the watershed drainage is largely agricultural. The oak-hickory forests surrounding the lake are typical of the native cover found within the Southern Till Plain Natural Division of central and southern Illinois. Pre-settlement vegetation was a mixture of 60 percent forest to 40 percent prairie and wetlands. A variety of trees, woodland and prairie plants cover the slopes of the stream valley.

In 1990, the City of Litchfield Council dedicated 266 acres of the buffer zone on the less developed eastern side of the lake as a conservation area. This tract of open woodlands, prairie barrens (flat land with sparse vegetation), deep ravines, ridges, and cliffs was dedicated to preserve the existing remnants of oak-hickory forest, barrens, and prairie on lake property. Shoal Creek Volunteers, a nongovernmental organization formed in 1990 has primary management responsibility for the Shoal Creek Conservation Area. This site has been designated as being of statewide significance for the high quality of its barrens community. It is home to nearly 750 species of plants. The 714 current taxa include 10 orchid species, 13 fern species, 80 grasses, and 43 sedge. The plant species range from the very common to the rare and endangered. Savanna Blazing Star (*Liatris scariosa* var. *nieuwlandii*) and Buffalo Clover (*Trifolium reflexum*) are state threatened.

Additionally, a survey of mushrooms conducted in the area during the 1993-1994 period identified 65 different species. Complete lists of vascular plants and mushrooms collected at the Shoal Creek Conservation Area are included in Appendix G.

2.4.1. Geology and Soils.

Information in this section was largely drawn from the 2009 Soil Survey for Montgomery County, IL, published by the U.S. Department of Agriculture, Natural Resources Conservation Service. The project study area is located in Montgomery County in southwestern Illinois. This county is in the Springfield Plain, which is in the Till Plains section of the Central Lowland Province of the Interior Plains Physiographic Division. Most of Montgomery County is on a nearly level to gently sloping ground moraine. As a result of geologic erosion, areas adjacent to the stream valleys and drainageways are gently sloping to very steep. Soils are of loess and till, rather light and a characteristic "claypan" can be found

Glacial deposits from the Illinois Episode of the Pleistocene Epoch exerted the most influence on the current landscape. The glacial till is commonly 25 to 50 feet thick but is likely much thicker in some of the deep valleys. The till is covered predominantly by loess, typically ranging from 40 to 60 inches in thickness in nearly level to gently sloping areas (Fehrenbacher and others, 1986). The till is exposed in the more sloping areas throughout the county.

Soils in the project area are primarily Hickory silt loam with slopes ranging from 10 to 35 percent. Other soil types present in the vicinity are Homen silt loam with 5 to 10 percent slopes, and small areas of Shoals and Terril loams, rarely flooded with 1 to 4 percent slopes. None of the soils in the vicinity of the proposed rock berm feature are classified as hydric, and the Hickory soil types are more likely to erode than the other soil types found in the project area. The predominate Hickory and Homen soil types are not classified as prime farmland, while Shoals and Terril loams are classified prime if drained.

2.4.2. Aquatic Resources.

Lake Lou Yaeger, a constructed reservoir formed by the impoundment of the West Branch of Shoal Creek, is the principal aquatic resource in the study area. The lake comprises approximately 1,300 acres of open water, with a shoreline length of 24.9 miles. Maximum depth of the lake is 31 feet, and it has an average depth of 10 feet.

2.4.3. Wetlands.

No targeted survey of existing wetlands in the project area has been conducted. However, examination of the U.S. Fish and Wildlife Service's National Wetlands Inventory maps indicate that existing forested and non-forested wetlands in the Lake Lou Yaeger watershed are limited to small tracts along the main channels of the upper reaches of Shoal Creek, Bluegrass Creek, and Shop Creek. Additionally, a number of farm impoundments are located in the upper reaches of the small tributaries that feed directly into the main portion of Lake Lou Yaeger.

2.4.4. Fisheries.

At least 15 fish species swim in the shallow, fertile waters of Lake Lou Yaeger. At this time, no species are being stocked by the Illinois Department of Natural Resources (IDNR) on an annual basis. Principal sport fish in the lake include bluegill, white crappie, channel catfish, and largemouth bass. Other species noted or collected by IDNR during general population surveys conducted in 2003, 2006, and 2009 include yellow bullhead, black bullhead, black crappie, flathead catfish, freshwater drum, gizzard shad, golden shiner, green sunfish, longear sunfish, orangespotted sunfish, and common carp.

Recent years' sampling results by IDNR have caused the agency to rate the status of bluegill, white crappie, and channel catfish populations from good to very good. Largemouth bass populations in the lake are rated as "developing." A rearing pond for largemouth bass is functional on City property. The City does stock 5" to 8" largemouth bass annually in an effort to maintain the predator base. IDNR has indicated they will stock the lake with 4 inch largemouth bass, if available, in 2016. At the present time, there are no zebra mussels in this lake. In 2012, a single pacu, a fish native to the Amazon River basin, was caught by a fisherman in the lake. It is likely this specimen was a discarded aquarium pet.

2.4.5. Wildlife.

The project area provides habitat for an array of game and nongame wildlife species. Many of these are listed as trust species by the U.S. Fish and Wildlife Service. Trust species include resident and migratory birds, as well as Federally listed endangered and threatened species. While there have been no surveys specifically targeting the immediate project site, surveys of butterflies and breeding birds conducted by volunteers at the nearby Shoal Creek Conservation Area identified 71 species of butterflies (one of these, the swamp metalmark, is a State listed endangered species) and 75 bird species as confirmed or potentially breeding in the survey area.

2.4.6. Endangered, Threatened, and Protected Species

Examination of a Trust Resources Report generated in May 2016 for the project area from the U.S. Fish and Wildlife's IPaC website revealed that three Federally listed species may potentially occur in this area: the Indiana bat (*Myotis sodalis*), currently listed as endangered; the northern long-eared bat (*Myotis septentrionalis*), currently listed as threatened; and the eastern prairie fringed orchid (*Platanthera leucophaea*), listed threatened. No designated critical habitat for these or any other species is known to be present in the project area and vicinity.

2.5. **Environmental Quality.**

2.5.1. Air Quality.

Air quality in the project area is generally good. No source of emissions currently exists within any of the alternative sites. The USEPA *Green Book Nonattainment Areas for Criteria Pollutants* (Green Book) maintains a list of all areas within the United States that are currently designated nonattainment areas with respect to one or more criteria air pollutants. Nonattainment areas are discussed by county or metropolitan statistical area (MSA). MSAs are geographic locations, characterized by a large population nucleus, that are comprised of adjacent communities with a high degree of social and economic integration. MSAs are generally composed of multiple counties. Review of the Green Book in 2016 indicates that Montgomery County, IL is in attainment for all federal NAAQS pollutants (http://www.epa.gov/oar/oaqps/greenbk/multipol.html).

2.5.2. Water Quality.

The watershed of Shoal Creek that drains to the Lake Lou Yaeger impoundment is approximately 74,550 acres, making a watershed to lake surface ratio of 58.7:1. Lakes with a high watershed/lake surface ratios (>25:1) have a greater potential for large sediment and nutrient loads into the lake.

Funding under the Federal and State clean lakes programs has been used by the Illinois EPA through its Section 319 program to support lake owners' interest and commitment to long-term comprehensive lake management. Nonpoint source pollution control recommendations contained in diagnostic/feasibility studies and watershed-based plans serve to supplement program initiatives and goals. Diagnostic/feasibility studies were completed for Lake Lou

Yaeger in 1995 and implementation has since begun. Causes of impairment addressed in these studies were total particulates (TP), dissolved oxygen (DO) and total suspended solids.

2.5.3 Hazardous, Toxic and Radioactive Waste.

A Phase I Site Assessment was completed on June 27, 2016. This assessment revealed no recognized environmental conditions in connection with the potential project. The Phase I Site Assessment is included as Appendix G.

2.5.4 Noise

The project study area is a relatively rural location where ambient noise levels are relatively low. There are many different noise sources throughout the area including commercial and recreational boats and other recreational vehicles; automobiles and trucks, and all-terrain vehicles; aircraft; machinery and motors; and industry-related noise. However, these sources are somewhat widely distributed, and there are no sensitive human receptors located in proximity to the rock berm construction site or any of the feasible proposed restoration sites.

2.6. **Socioeconomic Resources and Human Use.**

2.6.1 Demographics

The town of Litchfield and other communities that utilize Lake Lou Yaeger as a water supply are located in Montgomery County, Illinois, in the south central portion of the state. Litchfield is the largest community in the county with a population of 6,939 as recorded in the 2010 census (2015 population is estimated at 7,015). Total population of the county was estimated at 28,898 from 2015 census data. More than half of the county's population resides in the four largest cities: Litchfield, Hillsboro (the county seat), Coffeen, and Raymond.

Estimates of Litchfield demographics from 2010 data indicate there were 2,772 households, and 1,785 families residing in the city. The population density was 1,338.5 people per square mile (517.0/km²). There were 3,011 housing units at an average density of 591.4 per square mile (228.4/km²). The racial makeup of the city was 98.31% White, 0.37% African American, 0.18% Native American, 0.26% Asian, 0.01% Pacific Islander, 0.22% from other races, and 0.65% from two or more races. Hispanic or Latino of any race were 0.95% of the population.
There were 2,772 households out of which 31.3% had children under the age of 18 living with them, 48.7% were married couples living together, 11.9% had a female householder with no husband present, and 35.6% were non-families. 32.5% of all households were made up of individuals and 17.0% had someone living alone who was 65 years of age or older. The average household size was 2.37 and the average family size was 2.97.

In the city the population was spread out with 25.6% under the age of 18, 7.5% from 18 to 24, 26.6% from 25 to 44, 20.0% from 45 to 64, and 20.3% who were 65 years of age or older. The median age was 38 years. For every 100 females there were 86.1 males. For every 100 females age 18 and over, there were 80.3 males.

The median income for a household in the city was $28,717, and the median income for a family was $34,139. Males had a median income of $26,238 versus $19,545 for females. The per capita income for the city was $14,612. About 15.7% of families and 16.6% of the population were below the poverty line, including 22.9% of those under age 18 and 11.2% of those age 65 or over.

Low-income populations as of 2000 cover those whose income is $23,850 for a family of four and are identified using the Census Bureau's statistical poverty threshold. The Census Bureau defines a "poverty area" as a Census tract with 20 percent or more of its residents below the poverty threshold and an "extreme poverty area" as one with 40 percent or more below the poverty level. This is updated annually at http://aspe.hhs.gov/poverty/14poverty.cfm

Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, and Pacific Islander. A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. No minority populations were found to exist in the Lake Lou Yaeger study area.

2.6.2. Recreation and Aesthetics.

In addition to serving as the primary water supply for Litchfield and providing flood protection to areas in the watershed downstream of the dam, Lake Lou Yaeger is an important recreational resource to the city and surrounding region. The lake is publicly accessible and existing facilities offer a wide range of recreation opportunities to users, these include, but are not limited to, boating, fishing, swimming, camping (both primitive and developed), hiking and equestrian trails, picnic pavilions and the Shoal Creek Nature Preserve. The Lake offers more than 350 unimproved camping/picnicking sites which may be leased on a seasonal basis, as well as more than 400 lake accessible only annual lease sites, many with boat docks (Lake Lou Yaeger Master Plan, 2015).

3. PROBLEMS AND OBJECTIVES*

3.1. Problem Identification

In general, the aquatic ecosystem degradation problem at the lake is loss of habitat due to sediment deposition and shoreline erosion. This is resulting in loss of lake depth and surface area, and loss of aquatic habitat and wetlands.

Lake Lou Yaeger has seen a reduction in surface area and depth due to sediment contribution from the surrounding watershed and the northern tributaries, as well as wind and ice-induced bank erosion. The Lake Lou Yaeger Resource Plan (2001) says that between 1966 and 1990 the volume of the lake was estimated to be only approximately 73% of the original lake's volume and 14% of the lake's surface area had been lost (approximately 9.13 surface area acres per year). This analysis shows that sediment entering the lake from the watershed and northern tributaries is contributing to fish habitat problems at Lake Lou Yaeger by reducing the amount of available deep water habitat and raising temperatures resulting in reduced dissolved oxygen

levels. Furthermore, increased turbidity caused by excess sedimentation often smothers fish eggs, larvae, and benthic invertebrates, clogs the gills of delicate fry, and prohibits visual predation, mate location, and parental care. Lastly, wind and ice-induced bank erosion has degraded the eastern shoreline, resulting in high vertical banks which provide minimal cover and foraging habitat for fish and other wildlife. (See photo 1, which also displays use of revetment to arrest bank erosion.)

In addition to reduction in fish habitat, the bank erosion is causing a loss of shallow water habitat and shoreline wetlands. From the 1780's to the 1980's, the State of Illinois lost 85-90% of its wetlands (Dahl, T.E. 1990). In that same time frame the United States saw a decline of 30%. When compared with other states, the scope of wetland loss in Illinois is clear. Illinois ranks sixth in overall percentage of wetland loss, behind California, Indiana, Iowa, Missouri, and Ohio. In terms of acres of wetland loss, Illinois ranks fifth. Only Florida, Texas, Louisiana, and Arizona have lost more acres. Due to the large percentage and acreage of wetlands that have been lost, Illinois is in the top 10 percent of states with the greatest overall wetland loss over the past 200 years.

Photo 1: Portions of lake with no revetment (left side) and off-shore revetment (right side).

In summary, the aquatic ecosystem problems identified at Lake Lou Yaeger for evaluation during this study include:

- Loss of lake surface area due to sedimentation
- Reduction in lake depth due to sedimentation

- Loss of shoreline wetlands due to bank erosion
- Loss of shallow water habitat due to bank erosion and sedimentation
- Low levels of dissolved oxygen due to sedimentation

3.2. Opportunities

Opportunities exist to restore wetland habitat, function, and process; restore shallow water fisheries habitat, and maintain deep water habitat. Any restoration of wetlands in Illinois is significant both regionally and nationally because of the massive extent to which they have been lost.

Based upon historical accounts of early Illinois, it is likely that this area contained wetlands prior to modern settlement and agricultural practices. This proposed project is located in a still fairly flat part of the watershed, just upstream of the major topographic relief. Although higher in the watershed, it would have been subject to dependable hydrologic inputs. Beaver were very common in this setting and it would have been an ideal location for dam construction because of its hydrologic and topographical advantages. The type of wetland they maintained would have been historically common and functionally identical to the type we have the opportunity to restore.

Wetlands are recognized as a nationally significant resource because of their regulation and protection by the Clean Water Act and Executive Order 11990: Protection of Wetlands. In addition, wetlands are beneficial to waterfowl which are a nationally significant resource recognized by the Migratory Bird Treaty Act of 1918.

The following opportunities were identified for this study:
- Restore wetland habitat, function and process
- Allow for shallow water fisheries habitat
- Maintain deep water habitat

Although not the primary focus of the study, there are incidental opportunities to:
- Increase recreation opportunities
- Sustain water supply capability

3.3. Goals and Objectives

Initial discussions explored potential objectives to restore habitat for migratory and shorebirds, increase overwintering habitat, reduce invasive plant species, and improve water quality (dissolved oxygen, nutrients, etc). As the study progressed, it became apparent that habitats for birds and overwintering habitat for fish was plentiful in the lake and any potential restoration actions would not result in a meaningful increase to those habitats. Additionally, invasive plant species are already substantially addressed by the City's annual winter lake drawdown (by exposing the sediment to both freezing and loss of water, aquatic plants that have no overwintering structures are destroyed). Additional action regarding invasive plant species was determined to be unwarranted. Finally, water quality improvements fall outside the scope of the project's authority and therefore could not be considered for potential actions.

Therefore, the project goal is to restore, to the extent practical, quality, functional wetlands and habitat for aquatic organisms in Lake Lou Yaeger.

An objective is a statement of what an alternative should try to achieve. It should be related to the problems and/or opportunities already identified. The following objectives have been identified for this study:

Over the 50-year period of analysis,

- Restore herbaceous emergent wetlands
- Improve habitat for fish and other aquatic organisms

The study will evaluate each alternative's ability to meet these objectives by utilizing a habitat evaluation model.

3.4. Planning Constraints

A constraint is a restriction that limits the extent of the planning process for a particular study. It should focus on things that alternative plans should try to avoid. All studies have common constraints regarding complying with existing laws and policies, and avoid and minimized impact to cultural resources and threatened and endangered species. In addition to those standard constraints, for this study the team identified the following study-specific constraints:

- Avoid impacts to the dam and water supply intake
- Avoid or minimize impacts to private landowners
- Avoid or minimize impacts to recreation

3.5. Future Without Project

The without-project condition describes the area and its uses as anticipated over a 50-year period of analysis without any restoration implemented as a result of this study. This is the baseline conditions against which each of the various alternative plans and their impacts are compared.

3.5.1 Continued Sponsor Operation and Maintenance Responsibilities

For the future without project condition, it is assumed that the City will continue to operate and maintain the lake in accordance with the requirements of the program under which the lake was constructed (Watershed Protection and Flood Prevent Act, Public Law 83-566, 1954, as amended). For each structure/dam built under this PL 83-566, the Sponsor assumes responsibility for O&M of the dam. There is a signed Operation and Maintenance (O&M) Agreement and O&M Plan which identify the responsibilities. The City has two agreements with NRCS for dam inspection and maintenance of the two dams affiliated with the lake - the Five Mile Bridge dam, which is the dam at the silt basin to the northwest of the lake; and the Lake Lou Yaeger dam, the main dam at the south end of the lake. These agreements were established in 1981 with the former United States Department of Agriculture, Soil Conservation Service (now Natural Resources Conservation Service - NRCS). The City of Litchfield is responsible for funding the

inspection of the dams and writing and filing the dam reports. The City does this through a private engineering firm. Additional responsibilities for the dams include maintaining desirable vegetation, removing brush and woody vegetation, removing debris, and repairing damage to the earthworks, conduits, or other structural components.

PL 83-566 has a rehabilitation component which is administered by the NRCS. If funds are available in this program, they can be used for the following purposes:

(1) Protecting the integrity of the dam or extending the useful life of the dam beyond the original evaluated life expectancy.

(2) Correcting damage to the dam from a catastrophic event (100-year frequency rainfall event or a storm event that produces a flow in the auxiliary spillway of at least two feet or more in depth).

(3) Correcting the deterioration of structural components that are deteriorating at an abnormal rate.

(4) Upgrading the dam to meet changed land use conditions in a watershed served by the dam or changed safety criteria applicable to the dam.

(5) Decommissioning (removal) of the structure and stabilizing the site.

The rehabilitation program does not cover activities that are defined as operation and maintenance. Operation is defined as "administration, management, and performance of non-maintenance activities needed to keep a practice safe and functioning as planned." This includes being cognizant of changes in watershed conditions, both upstream and downstream from completed practices, that may alter the overall function of the project, so appropriate actions can be taken promptly. Maintenance is defined as "recurring activities necessary to retain or restore a practice in a safe and functioning condition, including the management of vegetation, the repair or replacement of failed components, the prevention or treatment of deterioration, and the repair of damages caused by flooding and vandalism."

3.5.2 Climate Change

Potential climate change issues, such as growing season lengths and changes in precipitation patterns, are significant scientific uncertainties for all environmental projects. For the future without action condition, it was determined that potential changes in runoff timing, volume, and sediment loads would affect all of the problems, opportunities, and potential actions equally and would not likely impact decision making. Therefore, the team made no effort to quantify potential climate change impacts.

The project area is a regulated reservoir. Consequently the potential impacts of regional climate change, whether the effect is to increase or decrease the amount of precipitation/runoff, would be expected to be lessened due to the ability to regulate outflows from the reservoir. For this

reason, the team assumed that no drastic alteration of aquatic habitat conditions would occur as a result of future changes in climate during the planning period.

3.5.3 Future Hydrologic and Hydraulic Conditions

The study assumed that the hydrologic and hydraulic conditions in the lake and watershed would not change significantly over the period of analysis. The upstream watershed is largely agricultural and there are no known major developments planned. The hydraulic conditions in the upper lake and tributaries would likely change gradually over time as additional sediment is delivered to the lake. This future condition is considered in the study's analysis. See Table 4.2 for calculated lake depths over time.

3.5.4 Future Aquatic Habitat Conditions

The aquatic habitat is not expected to change significantly over time for most of the lake. The exception is the northern end of the lake which will see measurable changes over time due to continued sediment deposition. This is considered in the analysis and can be seen in the calculations of lake depths over time (Table 4.1) and in the benefits analysis is Appendix C. The team projected that without the project, sediment would continue to accumulate at the northern end of the lake, with escalating encroachment farther downstream. Additionally, the team projected that deeper areas of the lake would eventually be lost, thus reducing essential deepwater and overwintering habitat.

Corps procedures for ecosystem restoration studies call for consideration of the significance of the resources to be restored. For this study, the primary focus is on restoration of wetlands and habitat for aquatic species. Wetlands have acknowledged institutional significance, as documented in Executive Order 11990, the Clean Water Act Sections 401 and 404; and the Migratory Bird Treaty Act of 1918. There is public significance demonstrated by both private and public land acquisition and the popularity of activities such as duck hunting which depend on wetlands. For technical significance, migratory waterfowl utilize the lake and surrounding wetlands during migration as resting, rearing, and feeding areas. Additionally, emergent and littoral wetlands act as buffers reducing watershed inputs into the lake.

With regard to aquatic habitat outside of wetlands, institutional significance is demonstrated by the attention and monetary support from Congressional representatives in the Illinois Capital Improvement Bill. The public recognizes the significance of the aquatic habitat by supporting the Henry Eilers Shoal Creek Conservation Area and the participation in the EPA Lake Monitoring Program. For technical significance, Lake Lou Yaeger provides a valuable habitat (large lake habitat) in central Illinois and in turn provides needed habitat for a variety of native fish species.

4. POTENTIAL PROJECT FEATURES

In order to accomplish the proposed objectives, potential features were proposed for consideration in this feasibility study. The potential measures are described in the following sections.

4.1. Potential Measures

Potential measures are actions that could contribute to achieving the Project objectives. Measures are considered the building blocks of alternatives. Alternatives often consist of multiple measures.

Table 4.1 identifies the types of measures that could potentially address each of the identified objectives.

OBJECTIVES	POTENTIAL MEASURES
1. Restore herbaceous emergent wetlands	Sediment Retention Lake Drawdown Revetment Plantings
2. Improve habitat for aquatic organisms	Sediment Retention Lake Drawdown Revetment Breakwaters Non-Revetment Bank Stabilization Plantings Fish Habitat Structure

Table 4.1. List of potential measures to address identified objectives.

The measures listed in Table 4.1 have been grouped into three categories for ease of discussion: sediment control, shoreline protection, and in-lake structure measures. To facilitate combining the measures into alternatives, each measure is given an alpha-numerical designation.

4.1.1 Sediment Control Measures

These measures are designated with the letter *S*, indicating *sediment*.

S0 – No Action. The "No Action" measures means that sediment control features would not be implemented.

S1 – In-Lake Sediment Retention Basin(s). This measure consists of construction of one or more sediment retention basins near the intersection of Raymond Spur (also known as West Fork Shoal Creek) and the Five Mile Bridge Spur (also known as Shop Creek) at the north end of Lake Lou Yaeger. In the Federal Interest Determination, this was conceptualized as a rock berm. The rock berm concept is only one possible design for this measure. The exact number and location of the basins will need to be determined and may result in the creation of additional measures identified as S1a, S1b, etc. (or some similar designation). Preliminarily, three general locations have been identified, all at the northern end of the lake where the two primary watersheds (Shop Creek and Shoal Creek) enter the lake. To construct the sediment basin the lake may need to be drawn down (Measure S4). This measure is combinable with any one of the L or P measures.

S2 – Lake Drawdown. This measure consists of lowering the lake 4 to 5 feet in the Spring and/or Summer to compact the soil for erosion control and would be needed for construction of above mentioned retention basins. The drawdown would also be beneficial for moist soil plants to colonize the exposed land providing food and habitat for wildlife. This measure is combinable with any one of the L or P measures but would have a significant impact on recreation in the lake.

S3 – New Tributary Sediment Retention Basin(s). This measure would construct sediment retention structures in one or more of the tributaries at the north end of the lake. The exact number and location of the basins will need to be determined and may result in the creation of additional measures identified as S3a, S3b, etc. (or some similar designation). Preliminarily, four general locations have been identified – one on Shop Creek, two on West Fork Shoal Creek, and one on Blue Grass Creek. Based on experience on other studies, these tributary sediment retention basins may not be policy compliant, as they are not within the floodplain of the lake.

S4 – Restore Existing Sediment Retention Basin. This measure would remove accumulated sediment from "Five Mile Lake", an existing sediment retention basin which has reached (or nearly reached) its sediment storage capacity. Five Mile Lake is located on Shop Creek, which appears to be the largest contributor of sediment to Lake Lou Yaeger. This measure may result in a mitigation requirement if wetlands or other critical habitat has developed as the lake has become more shallow.

4.1.2 Shoreline Protection Measures.

These measures are designated with the letter *P,* indicating *protection.*

P0 – No Action. The "No Action" measure means that shoreline protection measures would not be implemented.

P1 – On-shore revetment. Approximately 30,000 lineal feet of the lake shore require protection (exact length can vary). This measure consists of placing riprap on the shore in areas where erosion is most severe and highly erodible soils are present. Extending riprap into the water 8-10 feet provides ideal fish habitat.

P2 – Off-shore revetment. Approximately 30,000 lineal feet of the lake shore require protection (exact length can vary). This measure consists of placing riprap approximately 15 feet from the shoreline providing shoreline protection from wind fetch and allows plant growth. Excavated material from any of the "S" measures could be used to fill in the area between the riprap and the eroded shoreline creating additional littoral wetland habitat.

P3 – Breakwaters. Breakwaters (constructed in sections further from shore) could be constructed in areas with severe wind fetch induced erosion.

P4 – Non-Revetment bank stabilization. This measure would use bank stabilization methods such as lunkers or root wads that also provide fish habitat. Lunkers are open, wooden

box structures designed to eventually be buried under the edge of stream or lake banks to provide undercut bank habitat for fish and other aquatic organisms. Root wads are tree stumps with some roots still attached which are buried in the bank with the root wad extending into the water.

4.1.3. In-Lake Structure Measures

These measures are designated with the letter *L*, indicating *lake.*

L0 – No Action. The "No Action" measure means that in-lake structures would not be implemented.

L1 – Plantings. This measure would consist of planting native plants in suitable areas of the lake. However, the lake does not currently have large areas that would allow implementation of this measure to yield significant benefits as a stand-alone measure. Therefore, this measure must be combined with another measure which restores suitable areas for planting (such as revetment or sediment retention).

L2 – Fish Habitat Structure. This measure consists of constructing artificial reefs with rock or other natural material. Underwater reefs from riprap could be constructed on selected sites and in water deep enough not to be a hazard to lake users. Snags and trees should be left in the water, and more should be added. This is excellent fish habitat. Additional trees from surrounding upland forest management could be used as a source for woody fish habitat.

4.2. Preliminary Screening of Measures

Initial screening was performed using qualitative assessments of the effectiveness and acceptability of the measures. Secondary screening utilized an assessment of existing habitat conditions combined with professional judgment regarding conceptual costs and benefits.

4.2.1 Initial Screening

Each measure was discussed to determine whether any could be screened from further consideration. The team identified the following preliminary screening criteria:

- High Operation, Maintenance, Repair, Rehabilitation and Reconstruction (OMRR&R) cost (qualitative assessment)
- High cost combined with low benefits (qualitative assessment)
- Potential for induced flooding
- Impacts to recreation (unacceptable to the public)
- Environmental mitigation required

Initially, the following measures were screened from further consideration for the indicated reasons:

S2 – Lake Drawdown. This measure was screened out due to the large impact to recreation. The primary purpose of the drawdown is to allow colonization and growth of moist soil plants. This would necessitate the drawdown(s) to occur in Spring and/or Summer, which is

a time when recreational use of the lake is at its peak, and would disrupt recreational use of the lake. This would be unacceptable to the public and the sponsor (impacts to recreation).

S3 – New Tributary Sediment Retention Basin(s). This measure was screened out due to the potentially large cost of construction and land acquisition combined with high OMRR&R costs.

S4 – Restore Existing Sediment Retention Basin. Further examination of Five Mile Lake demonstrated that a substantial amount of mitigation would be required if any significant amount of excavation was performed. The potential restoration benefits for the lake were not likely to offset or exceed the required mitigation. This measure was screened from further consideration (mitigation, high cost with low benefits)

P3 – Breakwaters. Because the shoreline erosion problem is the result of small waves, it was determined that the Off-Shore Revetment measure (P2) would be sufficient to address the problem and these larger (and farther off shore) breakwaters would not be necessary. This measure was screened from further consideration for cost reasons.

P4 – Non-Revetment Bank Stabilization. Further research into this measure revealed many stream-related applications but few lake-based applications. The study team determined that it would not be effective in reducing the wave-wash erosion problem and would likely have high OMRR&R costs. This measure was screened from further consideration (high OMRR&R cost).

4.2.2 Secondary Screening

The study team then performed some initial data gathering and preliminary analyses to better define the extent of the identified problems and potential value of the ecosystem restoration opportunities. These were the team's findings:

1) There are no threatened or endangered species or any species of special significance utilizing the lake's aquatic habitat. Additionally, the observable structural fish habitat near the shoreline appeared to be plentiful. Adding more fish habitat structure (measure L2) would not yield significant benefits.

2) The northern end of the lake (approximately 200 acres or roughly 20% of the lake's surface area) has seen significant sediment deposition, reducing depths to an average of 3 feet and many areas are shallower. This allows the water temperatures to rise and levels of dissolved oxygen to be reduced in this area. It also reduces overwintering habitat in this area and may eventually prevent fish from accessing the tributaries. However, the lake currently has a significant amount of deeper water which remains cool, has sufficient dissolved oxygen, and provides plentiful overwintering habitat (see Table 4.2 which shows that the lake overall has an average depth of 11.7 feet). Additionally, it was found that the fish species in the lake do not require access to the tributary watersheds for their life cycle needs.

3) Available data showing the topography of the "lake bottom" before the lake was constructed was compared to a bathymetric survey conducted in 2011. This allowed the study team to determine the location and depth of sediment deposition over time. Due to the inability to survey very shallow areas, the 2011 bathymetric survey only covered 1,099 of the lake's total acres (approximately 1,300). This was considered sufficient coverage to allow for reliable average depth calculations.

   This information was then extrapolated into the future (assuming deposition patterns and estimates of current sediment transport rates) to determine if there would be any significant habitat loss over the standard 50-year period of analysis. Three overlapping areas near the northern end of the lake (the area of greatest deposition) were evaluated, as well as the lake as a whole.

   These locations and the calculated average depth changes are displayed in the following table:

Table 4.2. Locations and resulting calculations for lake depth changes over time

Location (by station – in feet above the dam)	Surface Area (acres)*	Avg Depth 2011 (feet)*	Avg Depth at Year 50 (feet)*	Years to Zero Avg Depth*
28500 and Upstream	31	3.3	0.9	70
23000 and Upstream	191	4.9	2.8	125
11750 and Upstream	694	8.4	6.8	297
Entire Lake	1099	11.7	10.6	794
*Note: Each reported area and depth includes the entire area upstream of that station (i.e. the numbers in each column are cumulative)				

4) The eastern shoreline erosion, while ongoing in areas not already addressed by the sponsor, does not appear to be making a significant contribution to the problems of lake depth and is not significantly reducing the total amount of wetlands in the lake. Additionally, addressing this erosion would not significantly contribute to the objective of improving aquatic habitat. Therefore, it does not appear that the remaining shoreline protection measures (P1 and P2) would yield sufficient benefits to warrant further consideration.

In conclusion, only measures S1 (In-Lake Sediment Retention) and L1 (Plantings) were carried forward after preliminary screening of measures.

4.3. Formulation of Alternatives

Because the plantings measure is not a stand-alone measure, the two alternatives considered for evaluation are S1 (In-Lake Sediment Retention alone) and S1L1 (In-Lake Sediment Retention with Plantings). For ease of terminology, these two alternatives will simply be called Retention (S1) and Retention with Plantings (S1L1).

Retention (S1)

The purpose of the Retention alternative is to capture suspended sediments coming into the lake from the tributaries and, over time, create shallow areas that support wetland restoration. The most cost-effective berm construction would be achieved via a rock structure placed strategically to balance its size with the acreage of wetlands to be restored.

Given that the vast majority of the sediments entering the lake are coming from Shop Creek (on the west) and Shoal Creek (on the east), the team considered four locations in the northern end of the lake for implementation of this measure. Table 4.3 contains the rationale for site selections and Figure 4.1 shows the location of each site.

Table 4.3. Site Selection Rationale for Retention Alternative (S1)

Site	Rationale for Site Selection
1	The most downstream site considered. This is the narrowest point of the lake downstream of the confluence of the two tributaries. Sites farther downstream would require much larger structures.
1a	Slightly upstream of Site 1 but still downstream of the confluence of the two tributaries. This site has existing road access where Site 1 would require a temporary road to be constructed over private property.
2	Located on Shop Creek just above the confluence with Shoal Creek. This would be a smaller structure than Sites 1 and 1a. This site has existing road access.
3	Located on Shoal Creek just above the confluence with Shop Creek. This would be a smaller structure than Sites 1 and 1a. This site does not have existing road access.

Additional habitat output could possibly be achieved by locating the berm "downstream" in the lake from Site 1. However, sites farther downstream were eliminated from consideration due to concerns with construction access (and associated mitigation for tree clearing) and increased recreation impacts as more of the lake would be eliminated from motorized access.

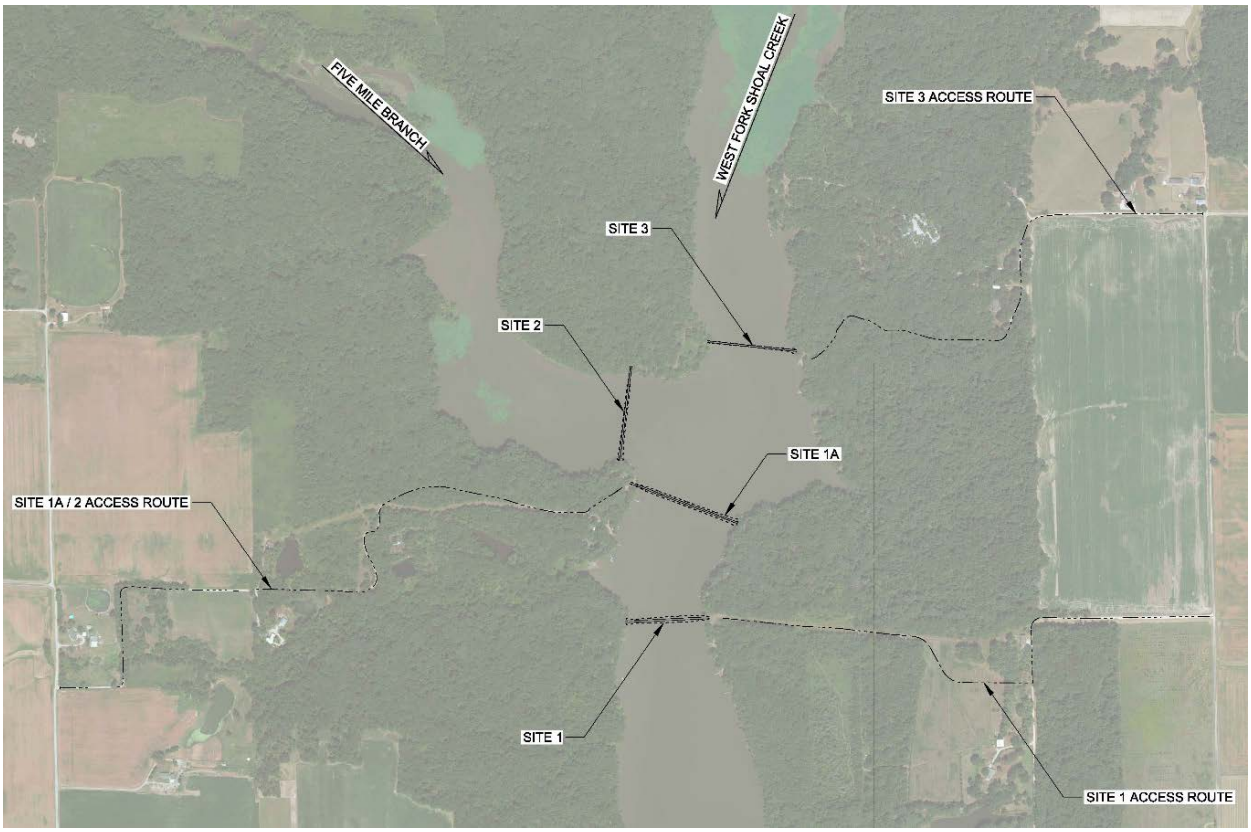

Figure 4.1. Locations considered for Alternative S1.

Retention with Plantings (S1L1)

This alternative would add Plantings to any or all of the Retention sites previously described. Adding plantings would have the effect of increasing the rate of habitat restoration and/or guiding the plant selection (as opposed to letting natural regeneration occur unassisted).

4.4. Screening of Alternatives

The study team utilized the same analysis conducted for the existing and future without project conditions to estimate the effects of the four Retention berm locations on sediment deposition. The changes in lake depths were calculated over time to estimate the timing and quantity of wetland restoration in each area. The results of the analysis for berm sites 2 and 3 revealed that there was no appreciable difference between the future without project and the future with project conditions (i.e., the areas upstream of the proposed sites for berms 2 and 3 are anticipated to convert to wetlands at approximately the same rate in both scenarios). Therefore, there is no real benefit to investing in berms at these locations.

After further consideration, the study team determined that the existing seed bank in the study area should be able to allow for natural regeneration and therefore the added cost of plantings would be unwarranted. Therefore, Alternative S1L1 was eliminated from further consideration. However, if post-project monitoring reveals an undesirable level of invasive species generation,

corrective action could be taken as an adaptive management measure. Additional information about monitoring and adaptive management can be found in Section 6.5.

5. EVALUATION OF FEASIBLE PROJECT ALTERNATIVES*

Only the Retention alternative was carried forward into full evaluation. For reasons previously stated, the alternative was only evaluated as Sites 1 and 1a. For simplicity and for the remainder of the analysis, the Retention alternatives at Sites 1 and 1a are referred to simply as Alternative 1 and Alternative 1a.

Alternative 1 Description

Alternative 1 is located at a relatively narrow part of the lake, downstream of the confluence of the Shop Creek and Shoal Creek. (See Figure 4.1). A rock berm would be constructed from the east bank to the west bank of the lake at this location (approximately 564 feet). The initial design calls for the top of the berm to be 6 inches below the height of the spillway crest. Figures 5.1 and 5.2 show a typical section and a profile of the berm, respectively. All elevations shown are referenced to the North American Vertical Datum of 1988 (NAVD88).

Preliminary hydraulic analysis indicates that this does not increase lake water surface elevations for flows up through 20,000 cubic feet per second (approximately a 1% chance recurrence 48-hour rainfall event) in the future without project condition and only increases water surface elevations by 0.26 feet in the with-project condition. This rise in the water surface elevation in the with-project condition is projected to occur within boundary of the land owned by the City. More detailed analyses are needed to confirm these conclusions and to examine greater rainfall events. After construction, in order to avoid destruction of the restored wetland vegetation, motorized boats would not be permitted upstream of the berm. Additionally, the 6 inches of water flowing over the berm during normal pool conditions would not support the passage of motorized boats.

The berm would be constructed from 1000 lb riprap. This sizing is based on preliminary calculations of flow velocities and anticipated turbulence during winter drawdown flow conditions. Quantities of riprap were calculated assuming 50% of the stone would be lost or settle into the soft sediments of the lake bottom during and following construction. The proposed design for the in-lake berm is to have a 10 foot wide crown and 1V:3H slopes. The 10 foot crown was selected to allow for the construction of the berm in wet conditions. Given the wide crown, future design will consider whether physical barriers are needed to discourage motorized use of the berm crown when it is exposed during winter drawdown. Bankline revetment is also included in the design to prevent lake flows from flanking the berm.

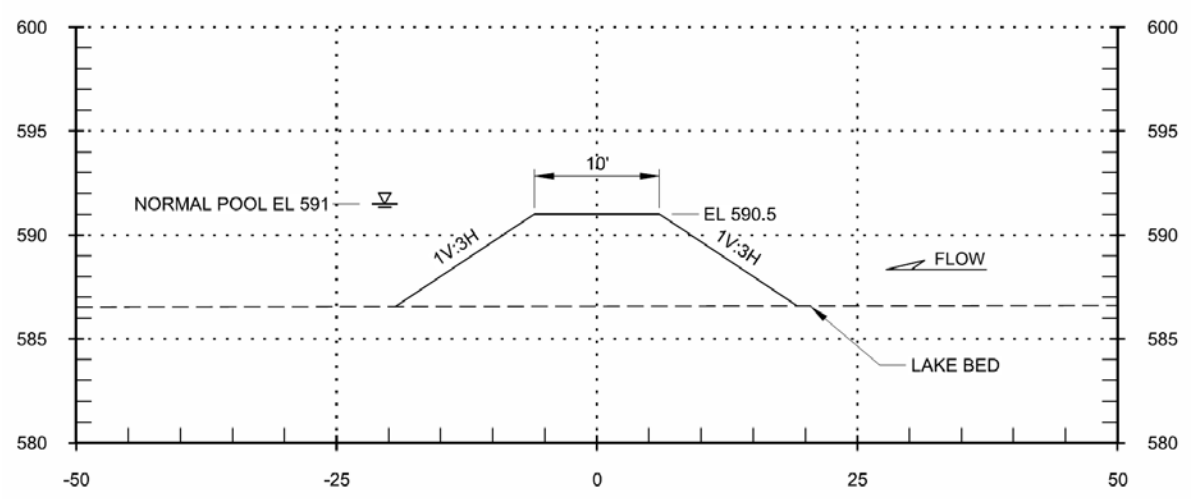

Figure 5.1 Alternative 1 Typical Section

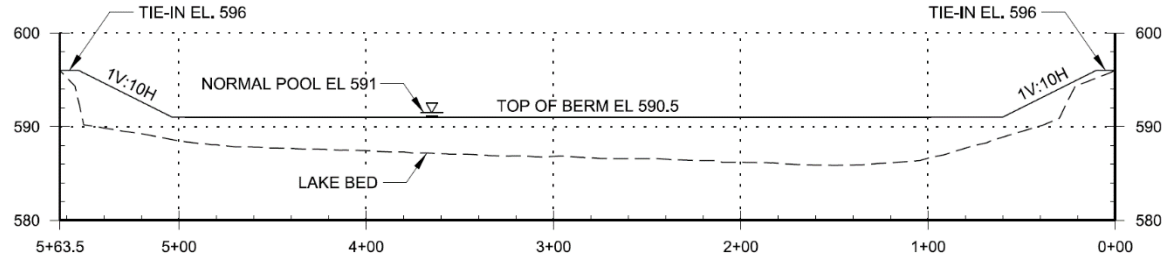

Figure 5.2 Alternative 1 Profile

There is access to this site from the east off of County Road 650 East and a private road called Privacy Lane. It would require construction of a temporary road crossing private land. It is anticipated that only a temporary construction easement is required because there would be no regular OMRR&R requirements. Inspections of the berm can be conducted via boat during winter drawdown. Approximately 1.3 acres of temporary construction and access easements are required for the berm construction.

Additionally, because the berm will impact recreation by eliminating all boat access from the lower lake to the area above the berm and there is no other public vehicular access to the area, this alternative includes improvements to an existing road on the east side of the lake which will facilitate non-motorized recreational access to the lake above the berm. For these road improvements, approximately 1.5 acres of permanent easement will be acquired.

Additional information about the berm design can be found in Appendix B.

<u>Alternative 1a Description</u>
Alternative 1a is also located at a relatively narrow part of the lake, downstream of the confluence of the Shop Creek and Shoal Creek and upstream of Alternative 1 (See Figure 4.1). The design of the berm at this location is essentially the same as Alternative 1, with differing quantities of materials. A rock berm would be constructed from the west bank to the east bank of the lake at this location (approximately 763 feet). The initial design calls for the top of the berm

to be 6 inches below the height of the spillway crest. Preliminary hydraulic analysis indicates that this does not increase lake water surface elevations for flows up through 20,000 cubic feet per second (approximately a 1% chance recurrence 48-hour rainfall event) in the future without project condition and only increases water surface elevations by 0.26 feet in the with-project condition. This rise in the water surface elevation in the with-project condition is projected to occur within boundary of the land owned by the City. More detailed analyses are needed to confirm these conclusions and to examine greater rainfall events. After construction, in order to avoid destruction of the restored wetland vegetation, motorized boats would not be permitted upstream of the berm. Additionally, the 6 inches of water flowing over the berm during normal pool conditions would not support the passage of motorized boats.

Alternative 1a would have a similar section and profile as Alternative 1 (see Figures 5.1 and 5.2, respectively). The exiting lake bed elevations would be the primary difference.

There is access to this site from the west off of Cemetery Lane, which is partially located on private land and partially on Sponsor-owned land. Improvements would be needed for the existing roadway. Because the berm will impact recreation by eliminating all boat access from the lower lake to the area above the berm and there is no other public vehicular access to this area, a permanent easement will be acquired and the road improvements will be left in place following construction in order to facilitate non-motorized recreational access to the lake above the berm. This will also facilitate inspections of the berm, though no regular OMRR&R is anticipated to be needed for the berm. Approximately 1.4 acres of permanent easements are required.

Additional information about the berm design can be found in Appendix B.

5.1. Environmental Outputs

The Habitat Evaluation Procedure (HEP) of the U.S. Fish and Wildlife Service was used to analyze aquatic habitat quality at Lake Lou Yaeger. HEP involves the selection of representative faunal species (indicator or evaluation species) and the subsequent evaluation of habitat quality relative to the species. The method is based on individual “habitat suitability index” (HSI) models (which range from 0.0 to 1.0) for each selected indicator species. The model also requires a structured evaluation of pertinent variables indicative of habitat quality for the indicator species. “Habitat units” (HU’s) are then calculated based on the products of habitat size and HSI's. Impacts are defined by the HEP method as the difference between with-project and without-project HU’s over the same time period. Appendix C contains a detailed description of the calculation of environmental outputs.

Alternative 1 Habitat Restoration

Non-forested (emergent) wetland habitat is proposed to be restored upstream of the berm. Representative wetland species selected to evaluate the benefits of restoring this habitat were the slider turtle and mink. These species models were selected simply as indicators of the quality of the existing and estimated future habitat that would benefit numerous species. In no way were the habitat restoration goals tailored to meet the particular needs of these two species.

HU's were calculated that numerically represent the restored acreage and the habitat quality of those acres. The evaluation estimates that over 40 acres of wetlands can be restored over the 50-year evaluation period.

Habitat improvements downstream of the berm due to reduced sedimentation were estimated using Bluegill and White Crappie models. Again, representative lake species were selected to evaluate the number of habitat units restored.

These restored habitat units are calculated over the 50-year period of analysis and result in "average annual habitat units" (AAHUs). This preliminary analysis resulted in a net total of 139 AAHUs for Alternative 1. The net annual impact reflects the difference between the future with- and future without- aquatic ecosystem conditions. As displayed in Table 5.1, approximately 139 more habitat units (HUs) would be available for indicator species every year during the life of the proposed project than would be available if the proposed project was not implemented.

Table 5.1. Alternative 1 Average Annual Habitat Units for indicator species for both future with- and future without- proposed ecosystem restoration conditions calculated using HEP.

Condition	AAHUs With Proposed Action	AAHU's Without Proposed Action	Net Annual Impact (rounded)
Non-Forest Wetlands	55	28	26
Open Water Habitat	896	783	113
Total	**951**	**811**	**139**

Alternative 1a Habitat Restoration

Construction of a berm at Alternative 1a would yield the same types of benefits but in different quantities due to the reduced area of restoration and different sediment accumulation rates. The same evaluation described above estimated that approximately 32 acres of wetlands could be restored over the 50-year evaluation period. As displayed in Table 5.2, this preliminary analysis resulted in a net total of 127 AAHU's for Alternative 1a.

Table 5.2. Alternative 1a Average Annual Habitat Units for indicator species for both future with- and future without- proposed ecosystem restoration conditions calculated using HEP.

Condition	AAHU's With Proposed Action	AAHU's Without Proposed Action	Net Annual Impact
Non-Forest Wetlands	49	27	22
Open Water Habitat	896	791	105
Total	**945**	**818**	**127**

5.2. Cost Effectiveness Evaluation and Incremental Cost Analysis of Alternatives

Comparison of alternative feature designs and combinations of features is accomplished through cost effectiveness evaluation and incremental cost analysis. Cost-effectiveness evaluation is used to identify the least costly solution to achieve a range of project benefits. Incremental cost analysis is a tool that can assist in making decisions on the scale or size of the project or of individual features by determining changes in costs associated with increasing levels of benefits.

Quantities and costs were estimated for both alternatives. Designs for both alternatives are similar, with the primary differences lying in the quantity of rock and the construction access. Costs for monitoring and adaptive management are anticipated to be the same for both sites.

The preliminary total first cost estimate for Alternative 1 is $1,215,200. This includes $1,026,700 for design and construction, as well as $188,500 in LERRD (Lands, Easements, Rights of Way, Relocations, and Disposal) costs.

The preliminary total first cost estimate for Alternative 1a is $818,800. This includes $707,300 for design and construction, as well as $111,500 in LERRD costs.

The estimated total first costs were annualized at April 2016 (FY16) price level. Costs were annualized over a 50 year period of analysis using the FY16 discount rate of 3.125%. A 50 year period of analysis was selected as ecosystem restoration benefits for each alternative are expected to exceed the 50 year time horizon. Even though benefits are expected to last longer than 50 years, ER 1105-2-100 states that the maximum planning horizon that can be used for non-major multipurpose reservoir projects is 50 years.

Table 5.3 summarizes the construction costs for each alternative. Engineering and design (E&D) costs consist primarily of the development of contracting documents but also include engineering support during construction to inspect progress and the final product. In addition to the actual

construction contract, construction costs also include supervision and administration of the contract, as well as an amount for contingencies.

Table 5.4 summarizes the annualized costs for each alternative. OMRR&R costs are for maintenance of the recreational access road. Activities associated with monitoring and adaptive management (M&AM) costs are described in Section 6.5. The total M&AM cost for both alternatives is $25,000. OMRR&R activities are described in Section 6.3 and are anticipated to cost $10,000 every 10 years. The period of construction is anticipated to last less than 1 year, therefore the annualized costs do not include any interest during construction.

Table 5.3. Summary of Total Project First Costs

	E&D	Construction	LERRD	Total First Cost
Alternative 1	$146,000	$880,700	$188,500	$1,215,200
Alternative 1a	$98,300	$609,000	$111,500	$818,800

Table 5.4. Summary of Annualized Costs

	Total First Cost	Annualized First Cost	Annualized OMRR&R	Annualized M&AM	Total Annualized Cost
Alternative 1	$1,215,200	$48,356	$867	$864	$50,088
Alternative 1a	$818,800	$32,582	$867	$864	$34,314

The previously calculated Average Annual Habitat Units (AAHU's) are summarized in Table 5.5 for both the wetlands and sediment reduction subsets.

Table 5.5. Summary of Lake Lou Yaeger Average Annual Habitat Units

Alternative 1	AAHU
Upper Lake (Wetlands)	26
Lower Lake (Sediment Reduction)	113
Total	139

Alternative 1a	AAHU
Upper Lake (Wetlands)	22
Lower Lake (Sediment Reduction)	105
Total	127

The three alternatives (No Action, Alternative 1 and Alternative 1a) were evaluated using the IWR Planning Suite II tool. The IWR Planning Suite II tool was developed to aide environmental and ecosystem restoration planning studies to perform cost-effectiveness and incremental cost analyses (CE/ICA) on alternatives. CE output determines which alternatives are the least costly for a given level of environmental output. ICA evaluates the efficiency of the cost-effective alternatives, to determine which provide the greatest increase in output for the least increase in

cost. The primary assumption used to conduct the Lake Lou Yaeger CE/ICA was that AAHUs for all analyzed habitats were assumed to have equal value in comparing alternative plans.

Of the three alternatives submitted into IWR Planning Suite II tool, all were determined to be cost effective (meaning there were no other plans that achieved the same benefits for less cost) and all were determined to be best buys. Best buy plans are the cost effective plans which provide the greatest increase in benefits for the least increase in cost. Table 5.6 shows the three alternatives' cost effectiveness. Figure 5.1 and Figure 5.2 show the same results of the output in a graphical format.

Table 5.6. Lake Lou Yaeger Cost Effectiveness

	Net Total AAHU	Annualized Cost	Average Cost per AAHU	Cost Effectiveness
No Action Plan	0	$ 0	0	Best Buy
Alternative 1	139	$50,088	$360	Best Buy
Alternative 1a	127	$34,314	$270	Best Buy

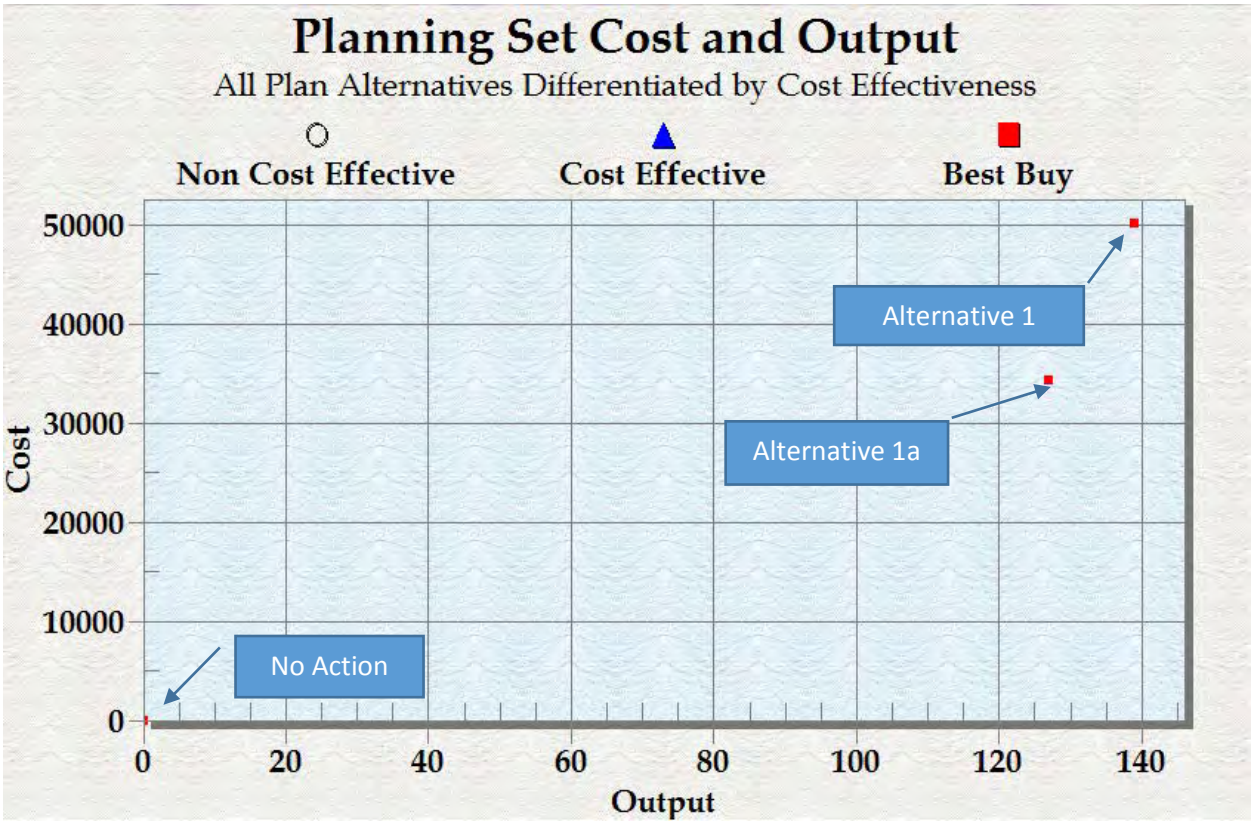

Figure 5-1. Lake Lou Yaeger Cost Effective Plans

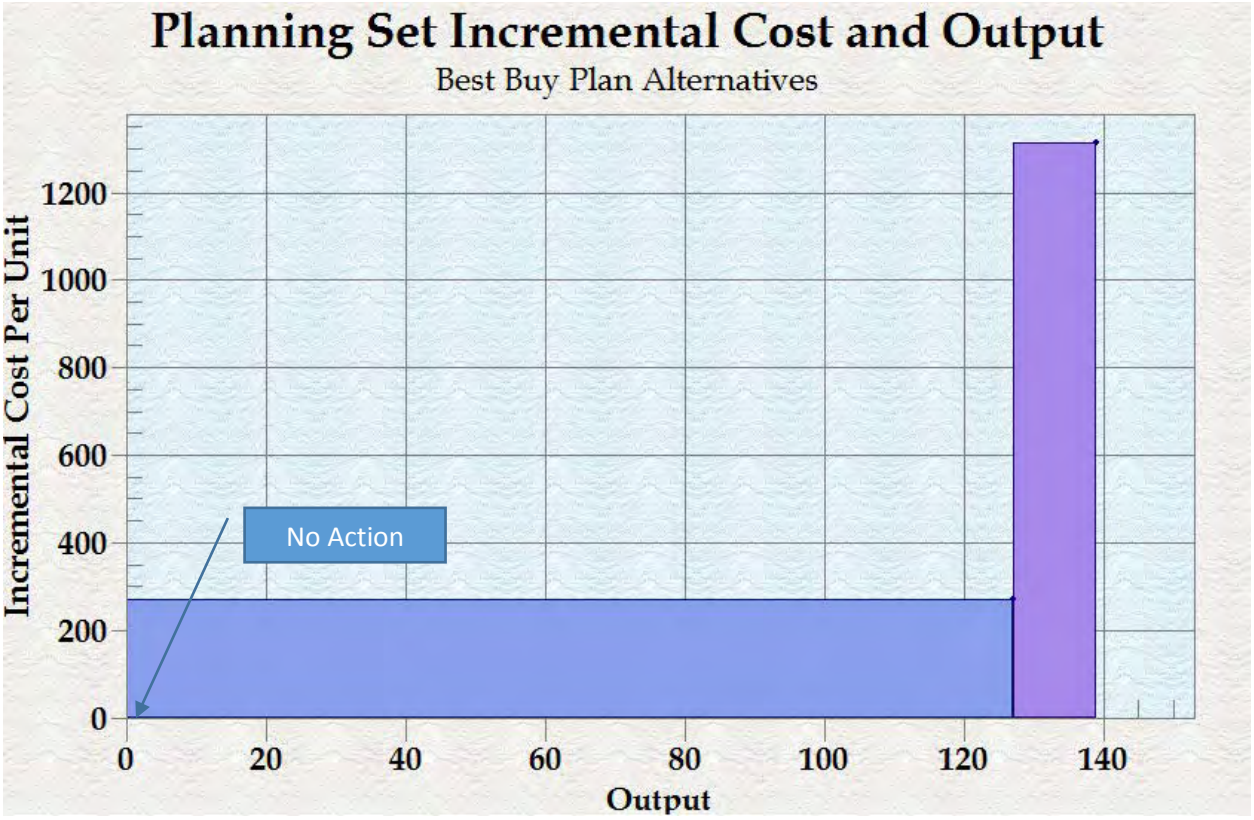

Figure 5-2. Lake Lou Yaeger Best Buy Plans

5.3. Completeness, Effectiveness, Efficiency and Acceptability

The Corps study team evaluated all three alternatives using the four evaluation criteria of the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (P&G paragraph 1.6.2 (c)). The four criteria are as follows:

Completeness. Completeness is the extent to which a given alternative plan provides and accounts for all necessary investments or other actions to ensure the realization of the planned effects. To establish the completeness of a plan, it is helpful to list those factors beyond the control of the planning team that are required to make the plan's effects (benefits) a reality.

The no action plan is not complete because it does not contain any investments that would yield habitat benefits. Both action alternatives are equally complete in that they may be constructed and maintained independent of influences outside the Federal and Sponsor's control. Additionally, the design and costs of both alternatives account for all investments needed to realize the targeted benefits.

Effectiveness. Effectiveness is the extent to which an alternative plan alleviates the specified problems and achieves the specified opportunities. An effective plan is responsive to the identified needs and makes a significant contribution to the solution of some problem or to the realization of some opportunity. It also contributes to the attainment of planning objectives. The most effective alternatives make significant contributions to all the planning objectives.

The no action plan is not effective because it does not address any of the problems or opportunities previously identified. Both action alternatives are effective at addressing the identified problems and opportunities. Alternative 1 is more effective than Alternative 1a because it yields more restoration benefits.

Both action alternatives contribute to the incidental opportunities related to water supply and recreation identified in Section 3.2. By capturing sediment in the northern part of the lake, the remainder of the lake will experience reduced rates of sediment deposition and loss of lake depths. This will extend the lake's ability to support water supply needs and recreation activities. Given the overall size of the lake and the relative proximities of the alternatives to each other, there is not anticipated to be any appreciable difference between the two alternatives related to their contribution to these incidental opportunities.

Efficiency. Efficiency is the extent to which an alternative plan is the most cost-effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the Nation's environment.

Although it is the least costly alternative, the no action plan is not efficient because it is also not effective. Alternative 1a is more efficient than Alternative 1 because it yields more restoration benefits at a lower cost than Alternative 1.

Acceptability. Acceptability is defined as the workability and viability of the alternative plan with respect to acceptance by Federal and non-Federal entities and the public and the compatibility with existing laws, regulations, and public policies.

The no action plan is not acceptable because it does not address any of the problems or opportunities. Both action plans have support from the Sponsor. The lake users and landowners in the vicinity are likely to view both alternatives similarly and have concerns about motorized boat access in the area above the berms. Both alternatives include access for non-motorized vessels above the berm, which may alleviate some of these concerns. The adjacent landowners may also have residual concerns about induced flooding, even after reading the analysis in this report. However, these are not anticipated to be widespread concerns.

5.4. Value Analysis

Per ER 11-1-321, Value Engineering (VE), states that the VE program applies to all procurement acquisitions that are federally funded, managed, and or executed by the Corps of Engineers, including Civil Works construction projects. ER 11-1-321, change 1 dated 01 January 2011 provides that the VE study applicability is for total Project of $1 million or more. The project does cost does not meet this threshold and, therefore, neither a Value Analysis (VA) nor a VE will be required.

5.5. National Ecosystem Restoration Plan

Using the results from the four P&G criteria as well as the incremental cost analysis, the study team determined that Alternative 1a is the NER plan. This determination was based on the following considerations:

- This is the most efficient plan
- There are no significant differences between the two plans with regard to completeness or acceptability.

5.6. Recommended Plan

USACE policy calls for the NER plan to be the recommended plan unless there are other factors to consider which would change that recommendation. Because the project purpose is ecosystem restoration, and there are no opportunities to add recreation features to the final array of alternatives, potential National Economic Development (NED) and Regional Economic Development (RED) benefits were not evaluated. It is possible that the incidental benefits to water supply and recreation could contribute to RED benefits. However, any effects are anticipated to be the same for both of the final alternatives.

The comparison of the Environmental Quality (EQ) for both plans yields very similar environmental benefits (with Alternative 1 being slightly more than the NER plan) and no negative environmental effects. A consideration of Other Social Effects (OSE) such as life and safety factors, energy requirements, and community impacts yields no difference between the two final alternatives.

Therefore, because there are no other factors which would lead to a different recommendation, the NER plan is the recommended plan. The recommended plan involves construction of a rock berm to encourage sediment deposition upstream of the berm. This will result in the restoration of 32 acres of emergent wetland upstream of the berm and also restore habitat for aquatic species downstream of the berm.

The preliminary estimated total first cost of the project was updated after Alternative 1a was identified as the recommended plan. The updated estimated total first cost of the recommended plan is $1,032,000 and it is anticipated to yield 127 net AAHUs. Using the Fiscal Year 2017 Federal discount rate of 2.875%, this results in an average annual cost of $322 per HU.

6. RECOMMENDED PLAN: DESIGN, CONSTRUCTION, OMRR&R CONSIDERATIONS*

6.1. Design Considerations

The Project has been developed to a feasibility level of design, with consideration given to the relative simplicity of the design. Design details are included in the technical appendices. As with all feasibility level studies, these details would be refined in the Plans and Specifications (P&S) Stage.

6.1.1. Hydrologic/Hydraulic Considerations

Simplifying assumptions were made to estimate the sedimentation rates and locations. Due to the relatively simplicity and low project risk, a limited amount of additional detailed design work will be needed to refine the sedimentation estimates.

Storm events up through 20,000 cubic feet per second (approximately a 1% chance recurrence, 48-hour rainfall event) were modeled to determine if the berm would increase upstream water surface elevations. No upstream effects were found for the modeled storm events in the future without project condition and minor increases to water surface elevations of 0.26 feet in the with-project condition. This rise in the water surface elevation in the with-project condition is projected to occur within boundary of the land owned by the City. During the design phase, additional modeling will be performed to confirm that there are no adverse effects for larger storm events.

6.1.2. Geotechnical Considerations

Estimates of riprap loss in the lake bed were based on the general knowledge that the lake bottom is comprised of unconsolidated sediments and organic material.

6.1.3. Civil Design Considerations

Preliminary design was based on LiDar and available bathymetry. The data may need to be updated and/or ground surveys may be needed.

6.2. Construction Considerations

The lake will need to be drawn down a minimum 2-3 feet from normal pool elevation of 591 during construction to allow for exposure of the top of grade of the berm during construction and to allow for dumping or rock and shaping of the structure. This will not de-water the site, therefore construction will be done in the wet. A draw down to expose the entire lake bed would be preferred but dewatering the site will not be required. The proposed design for the in-lake berm is to have a 10 foot wide crown and 1V:3H slopes. The 10 foot crown was selected to allow for the construction of the berm in wet conditions. It is assumed that the contractor will dump the required large stone with a smaller choke stone on top starting on one side of the lake and working across until the in-lake berm is complete. The contractor is anticipated to construct the berm from equipment working from the top of the berm as it is built. Details on specific construction methods, including a discussion of staging areas and their locations, access to the worksite(s), how construction would be undertaken and from where, and the location of the final disposal site of any excavated materials if applicable, as well as best management practices (BMPs) to minimize construction impacts to air quality, water resources, soil, and other regulated resources will be developed during the Plans & Specs phase of the project, and would be included in the contract plans and specification documents.

6.3. OMRR&R Cost Considerations

Once constructed, the berm is anticipated to be self-sustaining and not anticipated to need any regular OMRR&R during the 50-year period of analysis. Most of the time, flow velocities are expected to be low and unlikely to dislodge any stone. During winter drawdown, velocities are expected to increase over the berm and flow will become more turbulent. However, due to the necessary construction method, the berm's robustness is anticipated to be sufficient to handle these conditions. Therefore, needs for repair, replacement or rehabilitation are not anticipated.

There is no need to remove debris from the structure or perform any other routine maintenance. Due to the construction methodology, it is not anticipated that the stone will experience any significant settlement over time. The berm is an entirely passive feature and has no operational requirements.

Additionally, the wetlands, once established, will be self-sustaining and not require any maintenance activities during the 50-year period of analysis. Monitoring and adaptive management needs (which are not considered OMRR&R) are described in Section 6.5.

The recreation access road will require long-term maintenance, as needed. For the purpose of this study, it was estimated to require approximately 3 inches of gravel to be added to one third of the road every 10 years. Preliminary calculations estimate that this will cost approximately $10,000 every 10 years.

6.4. Real Estate Considerations

The proposed access to site 1a uses an existing road. The existing road is named Cemetery Lane which is a gravel road that connects 2 residences and several of the lakes west bank camping sites to East 5th Road. Cemetery Lane is partially located on private land and the sponsor's property. It is assumed that the entire length of Cemetery Lane will require improvement to sustain the transport of construction equipment. At some locations the access road would need to allow for the passage of large construction equipment. The access road will also require a permanent easement for approximately 1.5 acres of land.

6.5. Risk and Uncertainty and Adaptive Management.

Areas of risk and uncertainty have been analyzed and were defined so that decisions could be made with some knowledge of the degree of reliability of the estimated benefits and costs of alternative plans. Risk is defined as the probability or likelihood for an outcome. Uncertainty refers to a lack of knowledge. Uncertainty about the likelihood for an outcome results from a lack of knowledge about critical elements or processes contributing to risk or natural variability in the same elements or processes.

The study team worked to manage risk in developing project measures. It developed measures by expanding on and referencing successful similar work completed by the Corps and other resource agencies. The team used their experience from previous projects to identify possible risks and decrease uncertainty in plan formulation. The study team believes there is no

significant risk or uncertainty that may prohibit eventual success of the proposed habitats measures. The Corps would avoid significant risk by proper design, appropriate site selection, and sound monitoring. A Monitoring and Adaptive Management Plan is included as Appendix H to this report.

The study team predicts the rock berm would have very low risk of failure based on extensive hydraulic experience and modeling. This is a simple structure designed to withstand large flood and ice events and it is not anticipated to require future maintenance. The sponsor will inspect the structure to assure it remains functional and intact – this will be completed as part of the sponsor's operation and maintenance requirements.

The study team determined that uncertainties surrounding the success of the project are primarily linked to the following: 1) successful establishment of desirable aquatic vegetation in the wetland area, and 2) possible higher than estimated sedimentation rates in the wetland area.

The City already has a program for control of invasive species and the recommended plan calls for allowing the vegetation in the wetland area to establish from the available seed bank. The study team identified the success of persistent aquatic vegetation as having the highest degree of uncertainty, especially in the dynamic and complex nature of a flowing water environmental ecosystem. Therefore, the team determined if natural revegetation does not occur within a 5-year post construction period, supplemental planting efforts would ensure wetland success. The supplemental planting would include native wetland plant species found in this region in Illinois. Costs are included for annual post-construction monitoring ($1000 per year for 5 years), as well as the costs for potential plantings at year 5.

Higher than estimated sedimentation rates is another potential source of unsuccessful vegetation establishment in the wetlands. Monitoring of sedimentation rates will be accomplished by observing vegetation establishment (included in the vegetation monitoring previously described). If sedimentation appears to be depositing at rates that are detrimental to wetland vegetation establishment in the wetlands, the berm may be modified to allow additional flow to pass. A preliminary cost for modifying the berm is included at year 5. Table 6.1 lays out the monitoring and adaptive management costs over time, with year 0 being the year construction is completed.

Table 6.1 Monitoring and Adaptive Management Costs

	Years Post-Construction					
Costs for	0	1	2	3	4	5
Monitoring		$1,000	$1,000	$1,000	$1,000	$1,000
Adaptive Management						$20,000
Totals		**$1,000**	**$1,000**	**$1,000**	**$1,000**	**$21,000**
Note: Year 5 adaptive management includes plantings ($5000) and berm modification ($15,000)						

The total estimated cost of monitoring and adaptive management is $25,000. The non-Federal sponsor will collect data and participate in annual monitoring site visits. The Corps will determined if plantings or berm modification is needed and will collaborate with the sponsor regarding implementation. Appendix H contains the detailed monitoring and adaptive management plan.

7. SCHEDULE FOR DESIGN AND IMPLEMENTATION

Completion of the Feasibility Study is scheduled for early 2017. If both Federal and Sponsor funding for Design and Implementation is available, design could begin in 2017 and construction could complete in 2018.

8. COST ESTIMATES

Cost estimates supporting the identification of the recommended plan are located in Appendix E. The estimated total project first cost for Alternative 1a is $1,032,000.

8.1. Cost-Sharing and Implementation Considerations

The sponsor is the City of Litchfield, IL. The sponsor's cost sharing requirements consist of three primary components: 1) 35% of the cost of design and implementation (including land acquisition), 2) 35% of the monitoring and adaptive management costs, and 3) 50% of the study costs incurred after the first $100,000 was expended and before the Feasibility Cost Sharing Agreement (FCSA) was executed (referred to as "pre-FCSA cost").

With an estimated first cost for design and implementation of $1,032,000, the City's 35% share is $361,200. A portion of the City's share of design and implementation would be credit for acquisition of the required permanent easements, currently estimated to be $106,000. The remainder of the City's share ($255,200) can be contributed in cash or in-kind services. The pre-FCSA cost must be contributed in cash ($44,600) but the monitoring and adaptive management costs can be provided in cash or work in kind ($7,600). In total, the City's contribution during the design and construction phase is estimated to be $413,400. Table 8.1 summarizes both the Federal and the non-Federal cost-sharing requirements. Because the monitoring and adaptive management costs occur over time, they are presented in the table as their net present value so that all costs are presented in 2017 dollars.

Table 8.1. Summary of Project Cost-Sharing

	Non-Federal	Federal	Total
Design and Implementation Cost*	$361,200 (35%)	$670,800 (65%)	$1,032,000
Easement acquisition	$106,000	$0	
Cash or In-Kind	$255,200	$670,800	
Pre-FCSA Cost	$44,600	($44,600)	
Monitoring and Adaptive Management	$7,600	$14,100	$21,700
Total	**$413,400**	**$640,300**	**$1,053,700**

*All costs are in 2017 dollars.

9. ENVIRONMENTAL EFFECTS*

9.1. Cultural Resources

No known historic properties have been identified within the project area therefore no adverse impacts are anticipated to cultural resources. The access road has not been previously surveyed in accordance with Section 106 of the National Historic Preservation Act. Prior to acquisition of the permanent easement, a Phase I cultural resources survey will be completed for any areas of the road that will be improved beyond the existing footprint and any potential historic properties will be avoided. Preliminary coordination with the Illinois Historic Preservation Agency can be found in Appendix F.

9.2. Natural Resources.

9.2.1. Geology and Soils (Prime Farmland).

As noted in Section 2.4.1 above, none of the soils in the area proposed for project construction are classified as prime. For this reason, no impacts to lands designated as prime farmland are expected to result from the proposed action or feasible alternatives.

9.2.2. Aquatic Resources.

The primary impact of the proposed action on aquatic resources in the project area will be the establishment of a physical barrier (partially) separating the existing Lake Lou Yaeger into two distinct zones. The main body (lower portion) of the lake will remain deepwater aquatic habitat, while much of the upper reach (upstream of the rock berm) will gradually transition from deep aquatic to wetland habitat.

Construction of the proposed ecosystem restoration project is not expected to affect the existing water supply function of Lake Lou Yaeger, and should not significantly reduce the ability of the lake to meet anticipated future water demand by the city of Litchfield or other communities that currently obtain their water supply from this source.

9.2.3. Wetlands

The proposed action is expected to increase the extent of functional wetland habitat in the project area over what would be anticipated to occur under the No Action alternative, by increasing the rate of sediment deposition in the shallow upper portions of the reservoir. The habitat evaluation conducted for this project indicated that implementation of the preferred alternative will result in a net increase of 32 acres of nonforested wetland, over the No Action alternative. Wetlands created or accelerated through this method would connect to and build on existing wetland habitat along the channels of Shop, Shoal, and Blue Grass Creeks. At this time no mitigation is expected to be required for this project. This determination will be revisited in the PED phase if any design modifications are proposed.

9.2.4. Fishery Resources

The increase in wetland habitat anticipated to result from the proposed action will benefit centrarchids and other fish species in Lake Lou Yaeger by providing additional spawning and nursery habitat, thereby increasing survival and recruitment opportunities for hatchling and young-of-year fish.

9.2.5. Wildlife Resources

No significant adverse effects to wildlife resources are expected to result from the proposed action. Implementation of the tentatively selected plan will result in long-term benefits to wetland wildlife in the project area.

9.2.6. Threatened and Endangered Species Biological Assessment

USACE has coordinated with the U.S. Fish and Wildlife Service (FWS) regarding this project. FWS has indicated that neither a Planning Aid Letter nor a Coordination Act Report is necessary for this report and FWS completed its review and coordination during the public review period. Comments received as a result of coordination are included in Appendix F of this report.

Federally listed endangered and threatened species known to occur or potentially occurring in Montgomery County include the Indiana bat (*Myotis sodalis*), currently listed as endangered; the northern long-eared bat (*Myotis septentrionalis*), currently listed as threatened; and the eastern prairie fringed orchid (*Platanthera leucophaea*), listed threatened.

The Indiana bat utilizes large trees with peeling bark or cavities as summer roosts, forages in upland forests or small stream corridors with well-developed riparian woods, and uses caves or mines as winter hibernacula. The northern long-eared bat roosts and forages in upland woods and forests during summer months, and hibernates in caves and mines during winter months, swarming in surrounding wooded areas in autumn. No hibernacula for either species is present in the vicinity of the proposed project. If clearing of trees in the construction area is necessary, such clearing will be restricted to the period 1 November through 31 March, when bats are unlikely to be present. For this reason, USACE has determined that the proposed action is not likely to adversely affect either the Indiana bat or the northern long-eared bat.

The eastern prairie fringed orchid grows in a wide variety of habitats, from mesic prairie to wetlands such as sedge meadows, marsh edges, even bogs. This orchid is a perennial plant that grows from an underground tuber. Flowering begins from late June to early July, and lasts for 7 to 10 days. This species is not documented as occurring in the immediate project area vicinity, and does not appear on the list of plant species recorded for the nearby Shoal Creek Conservation Area. For these reasons, USACE has determined that the proposed project will not affect the eastern prairie fringed orchid.

No significant adverse impacts to bald eagles, other migratory birds, or state listed threatened and endangered species are expected to result from the proposed action. Increased wetland

habitat should provide benefits to wetland-dependent migratory birds and state-listed plant and animals that utilize the project area.

9.2.7. Air Quality

The proposed action would cause localized, temporary increases in exhaust emissions from equipment and vehicles during construction and placement activities. These impacts would be limited through emissions controls during activities, in compliance with USACE, USEPA, IEPA, and local laws and regulations. The action as proposed will not result in significant or long-term adverse impacts to air quality.

9.2.8. Water Quality

No significant adverse effects to water quality are anticipated to result from the proposed action. Construction of the rock berm will result in an increase in the rate of sedimentation above the berm. At the same time, rates of sedimentation in lake areas downstream of the berm should decrease somewhat. Total suspended solids below the berm are anticipated to decrease. As levels of TSS decrease, a water body begins to gain in its ability to support a diversity of aquatic life. Since suspended solids absorb heat from sunlight, decreases in TSS should result in decreases in water temperature and subsequently increased levels of dissolved oxygen (cooler water holds more oxygen than warmer water). Photosynthesis also increases, since more light penetrates the water. As more oxygen is produced by plants and algae, there is a further increase in dissolved oxygen levels.

High levels of TSS can destroy fish habitat because suspended solids settle to the bottom and can eventually blanket the river bed. Suspended solids can smother the eggs of fish and aquatic insects, and can suffocate newly-hatched insect larvae. Suspended solids can also harm fish directly by clogging gills, reducing growth rates, and lowering resistance to disease. Changes to the aquatic environment may result in a diminished food sources, and increased difficulties in finding food. Natural movements and migrations of aquatic populations may be disrupted. By reducing TSS levels in Lake Lou Yaeger, these detrimental impacts to fish and macroinvertebrate communities are anticipated to be lessened.

9.3. Aesthetics

Aesthetic values will be affected somewhat over the long term by the placement of a partial barrier between the upper and lower portions of the lake. Upper lake viewsheds will develop to a more marsh like state, while the lower lake would be expected to retain its current open water character.

9.4 Noise

The project study area is a relatively rural location where ambient noise levels are relatively low. There are many different noise sources throughout the area including commercial and recreational boats and other recreational vehicles; automobiles and trucks, and all terrain vehicles; aircraft; machinery and motors; and industry-related noise. However, these sources are

somewhat widely distributed, and there are no sensitive human receptors located in proximity to the rock berm construction site or any of the feasible proposed restoration sites.

9.5. Safety

Signage of the proposed structure will be necessary following construction to warn boaters of its location, due to the 6" clearance between the top elevation of the berm and the water surface. Provided this feature is adequately signed as a potential navigation hazard, no significant impacts to public safety are expected to result from project implementation.

9.6. Existing and Potential Water Supplies; Water Conservation; Water Related

Construction of the proposed ecosystem restoration project is not expected to affect the existing water supply function of Lake Lou Yaeger, and should not significantly reduce the ability of the lake to meet anticipated future water demand by the city of Litchfield or other communities that currently obtain their water supply from this source.

9.7. Socioeconomic Resources

As specified by Section 122 of Rivers, Harbors & Flood Control Act of 1970 (P.L. 91-611), seventeen environmental quality categories of impacts were reviewed and considered in arriving at the final determination. The following socioeconomic categories were considered: displacement of people, aesthetic values, community cohesion, desirable community growth, tax revenues, property values, public facilities, public services, desirable regional growth, employment, business and industrial activity, displacement of farms, man-made resources, natural resources, air and water. Long term significant impacts from the tentatively selected plan to these identified points are not expected. Temporary minor impacts from constructions activities would occur on some categories as listed below:

Considered Points of Environmental Quality	**Construction Effects**
Displacement of people	no effects
Aesthetic values	no effects
Community cohesion	no effects
Desirable community growth	no effects
Tax revenues	no effects
Property values	no effects
Public facilities	no significant adverse effects
Public services	no effects
Desirable regional growth	no effects
Employment	no effects
Business and industrial activity	minor beneficial effects
Displacement of farms	no effects
Man-made resources	no effects

9.8. Recreation

Minor adverse effects may result from the closing of upper portions of the lake to motorized boat traffic following project construction. However, non-motorized boat traffic will still be able to utilize the upper lake, accessing it via the included road improvements. Other recreational activities are unlikely to be significantly affected by the proposed action.

9.9. Parks, National and Historic Monuments, National Seashores, Wild and Scenic Rivers, Wilderness Areas, Research Sites, Etc.

No national and historic monuments, national seashores, wild and scenic rivers, wilderness areas, or research sites are located in the project area and as a consequence, no impacts to these resources are anticipated. No significant impacts to existing park facilities or designated natural areas, such as the Shoal Creek Conservation Area or the Roberts Cemetery Savanna Nature Preserve, are expected to result from the proposed action.

9.10. Prime and Unique Farmland

The proposed project will not result in any impacts to prime farmland or conversion of lands currently classified as prime to other uses.

9.11. Environmental Effects of Non-Preferred Alternatives

Under the no action alternative, the processes of sedimentation and loss of lake storage would continue at the present rate. No reduction in turbidity or suspended solids would occur in the lower lake, and the extent of forested and non-forested wetlands in the upper reaches of the lake and major tributaries would remain the same or increase only slightly. Construction of the proposed rock berm at alternate location would have positive and negative impacts similar to the preferred alternative, but lesser in quantity commensurate with the reduced size of the area being affected.

9.12. Hazardous, Toxic and Radioactive Wastes (HTRW)

A Phase I Site Assessment is complete and contained in Appendix G. No HTRW concerns were identified.

9.13. Cumulative Impacts

Consideration of cumulative effects requires a broader perspective than examining just the direct and indirect effects of a proposed action. It requires that reasonably foreseeable future impacts be assessed in the context of past and present effects on important resources. Often it requires consideration of a larger geographic area than just the immediate project area. One of the most important aspects of cumulative effects assessment is that it requires consideration of how actions by others (including those actions completely unrelated to the proposed action) have and will affect the same resources. In assessing cumulative effects, the key determinant of importance or significance is whether the incremental effect of the proposed action will alter the

sustainability of resources when added to other present and reasonably foreseeable future actions.

Cumulative environmental effects for the proposed ecosystem restoration project were assessed in accordance with guidance provided by the Council on Environmental Quality (CEQ) and U.S. Environmental Protection Agency (USEPA 315-R-99-002). This guidance provides an eleven-step process for identifying and evaluating cumulative effects in NEPA analyses.

The overall cumulative impact of the proposed Lake Lou Yaeger ecosystem restoration project is considered to be socially and economically beneficial, and to have no long term adverse environmental impact. Minor environmental impact resulting from berm construction includes adding rock fill to approximately 0.5 acre of shallow aquatic habitat.

Through this environmental assessment, cumulative effects issues and assessment goals are established, spatial and temporal boundaries are determined, and reasonably foreseeable future actions are identified. Cumulative effects are assessed to determine if sustainability of any of resources is significantly affected, with the goal of determining the incremental impact to key resources that would occur should the proposal be permitted. The spatial boundary being considered is the general area of the ecosystem restoration project. Three temporal boundaries were considered:

a. Past –1830s because this is the approximate time that the landscape was in its natural state, a vast prairie/wetland/woodland mosaic.

b. Present – 2016 when the decision was being made on the most beneficial ecosystem restoration project.

c. Future – 2065, the year used for determining project life end.

Projecting the reasonably foreseeable future actions is difficult. The proposed action (ecosystem restoration) is reasonably foreseeable. Actions by others that may affect the same resources are not as clear. Projections of those actions must rely on judgment as to which are reasonable based on existing trends and, where available, projections from qualified sources. Reasonably foreseeable does not include unfounded or speculative projections. In this case, reasonably foreseeable future actions include:

a. Continued growth in both population and water consumption within the watershed.

b. Continued conversion of agricultural and natural land to urban land use.

c. Continued application of environmental requirements such as those under the Clean Water Act.

The past has brought much alteration to the physical resources of the Shoal Creek watershed. Geology, soils, topography, hydrology and fluvial geomorphology have all been modified to suit human needs for purposes of habitation, commerce and recreation. As a result, water and

sediment quality are impacted due to site-specific and watershed-scale alterations, as well as by daily activities such as road salting, industrial and municipal discharge, poor agricultural practices and by contaminants from transportation/vehicles.

It is reasonably foreseeable that agricultural land will be converted to small residential subdivisions or other types of development, or else purchased by conservation organizations for ecological restoration purposes. In some cases this can potentially improve water quality in terms of nutrient loading, but in other instances it may introduce other types of contaminants such as petroleum, surfactants, nutrients (sewage and lawn fertilizers) and other chemicals.

Municipalities have adopted development and stormwater management ordinances, but they are not always applied to the full intent. Best management practices are not sufficient to prevent the influx of nutrients and other chemicals into streams and wetlands from existing domestic, agricultural and industrial land uses. Given the past, current and future condition of the Shoal Creek watershed, the implementation of the proposed project poses only minor impacts relative to the vast array and quantity of adverse effects caused by development, agriculture and industry.

The ecological diversity of the Shoal Creek watershed has suffered as a result of previous significant physical resource alterations. Extreme landscape modification since European settlement has caused nearly 90% of the original land cover to be converted to agricultural, residential, commercial and industrial land uses. Considering past, current and future conditions of the watershed, implementation of the present ecosystem restoration project applies minor cumulative impact in terms of the vast array and magnitude of significant effects caused by development, agriculture and industry. There are no significant losses of resources identified in terms of plant, insect, fish, amphibian, reptile, bird, or mammal taxa or to the habitats they occupy due to implementation of the tentatively selected plan.

9.14. Probable Adverse Impacts Which Cannot Be Avoided

Closing off of the upper portion of Lake Lou Yaeger to motorized boat traffic would be the primary unavoidable adverse effect of project implementation.

9.15. Relevant Laws and Regulations

The selected NER plan will be in compliance with all applicable federal environmental laws. Table 9-1 identifies relevant federal environmental laws and current compliance status.

Table 9-1. Relationship of Recommended Plan to Environmental Protection Statutes and Other Environmental Requirements

Federal Policies	Compliance
Analysis of Impacts on Prime and Unique Farmland (CEQ Memorandum, 11 Aug 80)	Not applicable
Clean Air Act, as amended, 42 U.S.C. 1857h-7, *et seq.*	Full compliance
Clean Water Act, 33 U.S.C. 1857h-7, et seq.	Partial compliance[2]
Coastal Zone Management Act, 16 U.S.C. 1451, *et seq.*	Not applicable
Endangered Species Act, 16 U.S.C. 1531, *et seq.*	Full compliance

Farmland Protection Policy Act, 7 U.S.C., 4201, *et seq*.	Not applicable
Federal Water Project Recreation Act, 16 U.S.C. 460-1(12), *et seq.*	Full compliance
Fish and Wildlife Coordination Act, 16 U.S.C. 601, *et seq.*	Full compliance
Flood Plain Management (Executive Order 11988)	Full compliance
Land and Water Conservation Fund Act, 16 U.S.C. 460/-460/-11, *et seq.*	Not applicable
Marine Protection Research and Sanctuary Act, 33 U.S.C. 1401, *et seq.*	Not applicable
National Environmental Policy Act, 42 U.S.C. 4321, *et seq.*	Partial compliance[3]
National Historic Preservation Act, 16 U.S.C. 470a, *et seq.*	Partial compliance[1]
Protection of Wetlands (Executive Order 11990)	Full compliance
River and Harbor Act, 33 U.S.C. 403, *et seq.*	Full compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, *et seq*.	Full compliance
Wild and Scenic Rivers Act, 16 U.S.C. 1271, *et seq*.	Full compliance

Full compliance. Having met all requirements of the statute for the current stage of planning (either preauthorization or postauthorization)

Partial compliance.

[1]Full compliance will be attained after all required archaeological investigations, reports and coordination have been completed.

[2]Full compliance will be attained upon completion of any permitting requirements or coordination with other agencies.

[3]Full compliance will be attained upon completion and signing of NEPA documents.

Not applicable. No requirements for the statute required; compliance for the current stage of planning

9.15.1. Floodplain Management, Executive Order 11988

The proposed action is located in an existing lake, which puts it in the base floodplain. The berm cannot be located outside of the base floodplain and still perform its function of trapping sediment to restore wetlands. The berm has been designed to have little to no impact on the base flood elevation. Preliminary analysis indicates no change in pre-construction flood heights or level of flood protection is expected to occur as a result of proposed ecosystem restoration measures. This action should not adversely impact floodplains or floodplain values. Additional analysis during the design phase will be needed to confirm this conclusion. If necessary, the berm design will be modified to ensure no impacts to flood heights or flood protection. The public has been involved throughout the study, including during an early scoping meeting and during the public review period for the draft report.

9.15.2. Protection of Wetlands, Executive Order 11990

The proposed action would not involve significant adverse impacts to wetlands. The proposed action is expected to increase the extent of functional wetland habitat in the project area over what would be anticipated to occur under the No Action alternative, by increasing the rate of sediment deposition in the shallow upper portions of the reservoir.

9.15.3 Rivers and Harbors Act

Section 122 of the River and Harbor Act of 1970 (Public Law 91-611, 84 STAT. 1823) requires that consideration be given to possible adverse economic, social and environmental effects. It also requires that final decisions on the project be made in the best overall public interest, taking into consideration the need for flood control, navigation and associated purposes; and the associated costs of eliminating or minimizing the following adverse effects:

Air, water and noise pollution;
Destruction or disruption of man-made and natural resources, esthetic values, community cohesion, and availability of public facilities and services;
Adverse employment effects;
Tax and property value losses;
Injurious displacement of people, businesses and farms;
Disruption of desirable community and regional growth.

Implementation of the proposed action would have no significant impacts on Section 122 identified economic, social or environmental resources.

9.15.4. Clean Water Act, as amended

As currently developed, both proposed alternatives would require a Clean Water Act (Section 404) permit, but both would fall under Nationwide Permit (NWP) 27 - Aquatic Habitat Restoration, Establishment, and Enhancement Activities. Because the proposed action meets the conditions of a Nationwide permit, no 404(b)(1) Evaluation has been prepared and no public notice process will be required. Following development of detailed design, review of regulatory requirements for the proposed action under Sections 404 and 401 of the Clean Water Act will be made in coordination with IEPA and IDNR Office of Water Resources. The proposed action would be in full compliance with these requirements prior to implementation.

9.15.5. Clean Air Act, as amended

The proposed action is expected to be in compliance with the Act. Mobile source emissions (construction vehicle exhaust fumes, fugitive dust) were estimated to be *de minimis* for criteria air pollutants. Based on these findings, the proposed project demonstrates conformity.

9.15.6. Invasive Species, Executive Order 13112

On February 3, 1999, President Clinton issued EO 13112 to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause by establishing the National Invasive Species Council. The proposed action is consistent with EO 13112 as it will use relevant programs and authorities to prevent the introduction of invasive species and not authorize, fund, or carry out actions likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere.

9.15.7. Migratory Bird Habitat Protection, Executive Order 13186, and Bald and Golden Eagle Protection Act of 1940

Executive Order 13186 proclaims the intent to support the conservation of previous migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions. This Executive Order requires environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on

species of concern. In addition, each Federal agency shall restore and enhance the habitat of migratory birds, as practicable. Implementation of the proposed action would result in benefits to migratory birds.

9.15.8. Endangered Species Act

USACE has determined that project is not likely to adversely affect any Federally listed endangered or threatened species currently Federally listed, proposed for Federal listing, or a candidate for Federal listing. No designated Critical Habitat for any Federally listed species will be affected by the proposed action. The U.S. Fish and Wildlife Service (FWS) has indicated that neither a Planning Aid Letter nor a Coordination Act Report is necessary for this report and FWS completed its review and coordination during the public review period. Comments received as a result of coordination are included in Appendix F of this report.

Pending completion of coordination with the IDNR, the proposed action is not expected to have significant or long-term adverse effects to any state-listed threatened or endangered species.

9.15.9. Fish and Wildlife Coordination Act, as amended

Project plans are being coordinated with the USFWS. Coordination responses, when received, will be included in Appendix F. The proposed action will be in full compliance.

9.15.10. Farmland Protection Policy Act, as amended

The proposed project would not result in the conversion of any prime, unique, or state or locally important farmland to nonagricultural uses. The preferred alternative would be in full compliance.

9.15.11. Environmental Justice, Executive Order 12898

Executive Order 12898 of 1994 and the Department of Defense's Strategy on Environmental Justice of 1995, which direct Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of Federal actions to minority and/or low-income populations.

Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, and Pacific Islander. A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population.

Low-income populations as of 2000 cover those whose income is $23,850 for a family of four and are identified using the Census Bureau's statistical poverty threshold. The Census Bureau defines a "poverty area" as a Census tract with 20 percent or more of its residents below the poverty threshold and an "extreme poverty area" as one with 40 percent or more below the poverty level. This is updated annually at http://aspe.hhs.gov/poverty/14poverty.cfm

A potential disproportionate impact may occur when the percent minority (50 percent) and/or percent low-income (20 percent) population in an Environmental Justice study area are greater than those in the reference community. The proposed action will not result in any change in land use or other impacts that would disproportionately affect minority or low-income populations, and is therefore considered to be in compliance with this EO.

9.15.12. National Historic Preservation Act, as amended

Pending completion of the Section 106 process it is anticipated the USACE will find the proposed undertaking will have no adverse effects on any district, site, building, structure, or object that is included or eligible for inclusion in the National Register. Initial coordination with the Illinois Historic Preservation Office is included in Appendix F. The proposed action will be in full compliance.

9.16. Short-Term versus Long-Term Productivity

The temporary increase in noise and the slight, temporary decrease in air and water quality which would occur during construction, are minor, temporary negative environmental impacts associated with a project that would produce positive ecosystem benefits.

9.17. Irreversible Resource Commitments

The fuel which machinery uses and construction materials such as clay and stone would be irretrievable commitments of resources associated with this project. There are no irrecoverable losses of resources identified with respect to geology, soils, topography, hydrology, water quality or fluvial geomorphology due to implementation of the recommended plan.

9.18. Relationship of the Proposed Project to Other Planning Efforts

The proposed action is consistent with known land-use plans for this area.

10. PROJECT PERFORMANCE ASSESSMENT MONITORING

The Monitoring and Adaptive Management (M&AM) plan is included as Appendix H to this report. An outline of the proposed monitoring and adaptive management is included in Section 6.5.

Monitoring needs would likely be limited, as the system is passive once constructed. Monitoring plans focus on the overall project goal (to restore, to the extent practical, quality, functional wetlands and habitat for aquatic organisms in Lake Lou Yaeger) and objectives (Restore herbaceous emergent wetlands; improve habitat for aquatic organisms) and are developed to be consistent with USACE implementation guidance for Section 2039 of the WRDA 2007, *Monitoring Ecosystem Restoration*. Monitoring activities will therefore concentrate on changes in water depths upstream of the rock berm and observations of vegetation (coverage and species composition) above the berm.

Potential adaptive management needs currently identified include concerns with invasive species recruitment in the wetland area and flow-related concerns over the dike leading to design modifications.

11. REAL ESTATE REQUIREMENTS

Approximately 1.5 acres of permanent easements are required. Appendix D contains more detailed information about the real estate requirements.

12. ENVIRONMENTAL OPERATING PRINCIPALS

The recommended plan is consistent with the USACE Environmental Operating Principles by

1. Fostering sustainability as a way of life throughout the organization;
2. Proactively considering environmental consequences of all Corps activities and act accordingly;
3. Creating mutually supporting economic and environmentally sustainable solutions;
4. Continuing to meet our corporate responsibility and accountability under the law for activities undertaken by the Corps which may impact human and natural environments;
5. Considering the environment in employing a risk management and systems approach throughout life cycles of projects and programs;
6. Leveraging scientific, economic, and social knowledge to understand the environmental context and effects of Corps actions in a collaborative manner;
7. Employing an open, transparent process that respects views of individuals and groups interested in Corps activities.

The team consistently used the EOP's in the formulation, evaluation, and selection process by assessing the risks throughout the life of the planning process and incorporating those risks as evaluation criteria. The recommended plan promotes sustainability and economically sound features by incorporating the most natural and least cost methods for restoring wetlands and habitat for aquatic organisms. Alternative formulation involved collaborative interactions with multiple agencies and stakeholders and the general public were engaged via public meetings and other public forums.

13. FEDERAL RESPONSIBILITIES

The Federal Government will provide 65 percent of the first costs of the construction, as well as monitoring and adaptive management costs. Table 8.1 provides a detailed breakdown of the cost-sharing. The total estimated project first cost is $1,032,000 and the Federal portion of this Project is estimated at $640,300. USACE will prepare the plans and specifications; complete all NEPA requirements; execute a Project Partnership Agreement (PPA) with the Sponsor; advertise and award a construction contract; and perform construction contract supervision and administration.

14. NON-FEDERAL RESPONSIBILITIES

The City of Litchfield, IL, is the NFS for this Project. This section describes the responsibilities of the NFS in conjunction with the Federal Government to implement the recommended plan.

A model Section 206 PPA will be reviewed by the NFS and its legal representation. The NFS is aware of the responsibilities. The PPA will be executed prior to implementation. A letter of intent to serve as the NFS will be provided in Appendix F.

In general, and in accordance with Section 206 of Public Law 104-303, the non-Federal Sponsor shall cost share 35 percent of the total project cost, including provision of all lands, easements, rights-of-way, and necessary relocations, as well as monitoring and adaptive management costs. The sponsor will be responsible for operating and maintaining the Project at 100 percent non-Federal expense upon completion of construction.

Specifically, the non-Federal Sponsor shall:

- provide all lands, easements, rights-of-way and relocations determined by the Federal Government to be necessary for construction, operation, and maintenance of the Project.
- provide, during construction, any additional costs as necessary to make the total non-Federal contributions equal to 35 percent of the total Project costs. The non-Federal Project cost share is estimated at $413,400. The sponsor may receive credit towards its share of Project costs for the value of the LERRD provided for Project purposes. The estimated costs of the LERRD required for the Project is approximately $106,000. The sponsor is anticipated to provide monitoring and adaptive management work-in-kind as part of their cost share responsibilities.
- for so long as the Project is authorized, operate, maintain, repair, replace, and rehabilitate the completed Project or functional portion of the completed Project, at no cost to the Federal Government, in accordance with the applicable Federal and state laws and any specific directions prescribed by the Federal Government. The operation, maintenance, repair, replacement, and rehabilitation costs are estimated at $10,000 every ten years.
- hold and save the Federal Government from damages due to the construction and operation and maintenance of the Project, except where such damages are due to the fault or negligence of the Federal Government or its contractors.
- grant the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon land which the sponsor owns or controls for access to the Project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the Project.
- keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the Project to the extent and in such detail as will properly reflect total Project costs for a minimum of three years after completion of the accounting for which such books, records, documents, and other evidence are required.
- perform, or cause to be performed, any investigations for hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way necessary for construction, operation, and maintenance of the Project; except that the non-Federal Sponsor shall not perform such investigations on lands,

easements, or rights-of-way that the Federal Government determines to be subject to the navigation servitude without prior specific written direction by the Federal Government.

- assume complete financial responsibility for all necessary cleanup and response costs of any CERCLA-regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines are necessary for construction, operation, and maintenance of the Project.
- agree that, as between the Federal Government and the NFS, the NFS shall be the operator of the Project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the Project in a manner that will not cause liability to arise under CERCLA
- prevent obstructions of, or encroachments on, the Project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the aquatic ecosystem restoration, hinder its operation and maintenance, or interfere with the proper function such as any new development on Project lands or the addition of facilities that would degrade the benefits of the Project.
- comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601- 4655), and the Uniform Regulations contained in 49 C.F.R. Part 24, in acquiring lands, easements, and rights-of-way required for construction, operation, maintenance, repair, replacement, and rehabilitation of the Project, including those required for relocations, the borrowing of material, or disposal of dredged or excavated material, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.
- comply with all applicable Federal and state laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements, including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq*.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq*.) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)
- provide the non-Federal share of that portion of the costs of data recovery activities associated with historic preservation that are in excess of the 1 percent of the total amount authorized to be appropriated for the Project, in accordance with the cost sharing provisions of the Project Partnership Agreement.
- not use Federal funds to meet the non-Federal Sponsor's share of total Project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized.
- Participate with the District in monitoring and adaptively managing the finished Project to assure the Project meets its environmental restoration goals.

15. COORDINATION, PUBLIC VIEWS, AND COMMENTS*

A public scoping meeting was held in Litchfield in December 2013. The attendees were presented with general information about the study authority, the problems as they were understood at that time, and the study process going forward. They were invited to ask questions and comment on any additional problems or opportunities that they believed should be considered during the study. Comments received during the meeting included concerns about reducing sediment input from upstream, removing sediment from areas around boat ramps, ways to reduced localized sediment inputs, and possible conflicting uses of the lake (flood control, water supply, recreation).

The results of preliminary analysis and measure screening were presented to the Litchfield City Council in July 2015. The Council meeting is open to the public and there were representatives of the public and the press in attendance.

In accordance with USACE regulation, a 30-day public review period of the draft integrated report was conducted from October 28, 2016, to December 2, 2016. During this review period, a public meeting was held to present the report's recommendation(s). The public's comments were collected and incorporated into the report where appropriate. Appendix F includes a listing of who received the notification of public review, comments received, and responses.

Coordination with the U.S. Fish and Wildlife Service (FWS) has occurred throughout the study period. The FWS declined to provide a planning aid letter, citing the small size of the project. They also declined to participate in the habitat evaluation effort, due to resource issues. The FWS will complete its Fish and Wildlife Coordination Act review during the public review of the report.

The local office of the Natural Resources Conservation Service (NRCS) was consulted to confirm the City's lake maintenance requirements, as well as to understand and utilize as practicable past NRCS analyses related to the sedimentation concerns at the lake.

The Corps has provided written notification to the State of Illinois' Historic Preservation Agency that there is a proposed project and requests concurrence with the proposed investigation and monitoring plan. A copy of this letter is provided in Appendix F.

16. CONCLUSIONS AND RECOMMENDATIONS

The recommended plan involves construction of a rock berm to encourage sediment deposition upstream of the berm. This will result in the restoration of 32 acres of emergent wetland upstream of the berm and also restore habitat for aquatic species downstream of the berm. The estimated total first cost of the project is $1,032,000 and it is anticipated to yield 127 net AAHU's. This results in an average annual cost of $322 per HU.

It is proposed that the ecosystem features identified as the recommended plan proceed with implementation in accordance with the cost sharing provisions set forth in this report. This recommendation is made with the provision that, prior to project implementation, the non-

Federal sponsor shall enter into a binding agreement with the Secretary of the Army to perform the identified items of local cooperation.

The recommendations contained herein reflect the information available at this time, and current Department of the Army, and U.S. Army Corps of Engineer policies governing formulation of projects. The recommendations do not reflect the program and budget priorities inherent to the formulation of a national Civil Works construction program, not the perspective of higher review levels within the Executive Branch of the U.S. Government.

17. REFERENCES

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FINDING OF NO SIGNIFICANT IMPACT

SECTION 206 ECOSYSTEM RESTORATION

FEASIBILITY REPORT

WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

LAKE LOU YAEGER

CITY OF LITCHFIELD

MONTGOMERY COUNTY, ILLINOIS

I. I have reviewed and evaluated the documents concerning the proposed Lake Lou Yaeger Aquatic Ecosystem Restoration Project, located in Montgomery County, Illinois. The project involves the construction of a rock berm across the upper end of the lake to encourage sediment deposition and the development of non-forest emergent wetland upstream of the berm. This project is projected to result in the net restoration of 32 acres of non-forest emergent wetland upstream of the berm, and also to reduce sediment deposition downstream of the berm, resulting in improved habitat for aquatic organisms.

II. As part of this evaluation, I have considered:

a). Existing Resources and Future without Project – No Action;

b). Impact to Existing Resources with Alternative 1a – Construction of an in-lake sediment retention berm, approximately 763 feet in length (Recommended Plan).

III. The possible consequences of these alternatives have been studied for physical, environmental, cultural, social and economic effects. Significant factors evaluated as part of my review include:

a. The Project is anticipated to improve the habitat value of Lake Lou Yaeger for wetland-utilizing fish and wildlife, and to decrease the rate of loss of deepwater habitat/lake storage over time.

b. Land use after the project should remain unaltered, and no significant social or economic impacts to the project area are expected.

c. No recreational or commercial fisheries; national and historic monuments, national seashores, wild and scenic rivers, wilderness areas, research sites, etc. would be adversely impacted by the project.

d. Aside from temporary disturbances during construction, no long-term significant adverse impacts to natural or cultural resources are anticipated. No federally protected species would be affected by the proposed action. No hazardous and toxic waste issues are expected. No significant cumulative impacts are anticipated. No disproportionately high and adverse human health or environmental impacts on minority populations and low-income populations would occur (environmental justice).

e. If clearing of trees in the construction area is necessary, such clearing will be restricted to the period 1 November through 31 March, when bats are unlikely to be present.

f. Compliance with Clean Water Act Section 404, and Rivers and Harbors Act Section 10 is achieved under Nationwide Permit 27 for Aquatic Habitat Restoration, Establishment, and Enhancement Activities. Compliance with Section 106 of the National Historic Preservation Act (NHPA) will be achieved by execution of the Programmatic Agreement with the Illinois State Historic Preservation Office to avoid or mitigate all adverse impacts to historic properties eligible for inclusion in the National Register of Historic Places. Compliance with the Archaeological and Historic Preservation Act will be achieved upon completion of coordination. The Fish and Wildlife Service will review the document during public review to ensure compliance with the Endangered Species Act and Fish and Wildlife Coordination Act. Compliance with the National Environmental Policy Act will be achieved with the signing of this document. The project is in compliance with all other applicable laws and regulations as documented in Table 9.1 of the Integrated Environmental Assessment.

g. The "No Action" alternative was evaluated and would be unacceptable to recommend as it does not meet the project purpose of restoring quality, functional wetlands and habitat for aquatic organisms in Lake Lou Yaeger.

IV. Based on the disclosure of the Recommended Plan impacts contained within the Environmental Assessment, no significant impacts to the environment are anticipated. The proposed action has been coordinated with the appropriate resource agencies, and there are no significant unresolved issues. I find that the proposed Lake Lou Yaeger Aquatic Ecosystem Restoration Project, located in Montgomery County, Illinois, would not significantly affect the quality of the human environment. Therefore, I have determined that an Environmental Impact Statement is not required.

MAY 30 2017

Date

Anthony P. Mitchell
Colonel, U.S. Army
District Commander

Appendix A

Hydrology and Hydraulics

Introduction and Location of Site

Lake Lou Yaeger is utilized by the City of Litchfield Water Treatment Facility as a water supply and as a recreation facility for the surrounding communities. The Lake encompasses approximately 1,300-1,400 acres and is approximately 8 miles long and 0.5 miles at its widest. Water elevation is controlled by a concrete spillway with an overtopping elevation of 591.5 ft and a winter drawdown elevation of 587.5 ft.

An annual drawdown of the lake is performed. This drawdown, which typically begins during late fall, provides extra storage volume for late winter and spring runoff. The drawdown is performed with the outlet conduit that is located about 700 feet toward the east of the center of the principal spillway and about 100 feet upstream of the center of the dam. The goal of the drawdown of the lake is to lower its elevation about four feet below the elevation of the principal spillway. Data for the drawdown during late 2014 into early 2015 shows that it commenced on 20 November 2014. The lake reached its lowest level of about four feet below the elevation of the principal spillway by early February 2015. Some fluctuations of the lake elevation occurred during the drawdown as the result of runoff from precipitation.

The main focus of this project was at the upper or northern end of the lake where the effects of sedimentation are most noticeable and where possible measures could be taken to counter sedimentation without impacting other uses of the lake. The upper end of Lake Lou Yaeger is fed by three main tributaries: Blue Grass Creek, Shoal Creek, and Shop Creek (formally Shoal Creek No 2 and consisting of 3 parts, Shop Creek, Five Mile Lake and Threemile Creek). Shop Creek flows into Five Mile Lake, an existing detention feature located approximately 1.4 miles upstream from Lake Lou Yaeger. Threemile Creek flows into the lower end of Five Mile Lake and is the portion of the waterway between Five Mile Lake and Lake Lou Yaeger. However, for this study's purposes, calculations were based on Shop Creek, Five Mile Lake and Threemile Creek as one waterway and listed as Shop Creek. Five Mile Lake was constructed in 1966, the same year as Lake Lou Yaeger, but is considered effectively full at this time and is no longer functioning as a sediment detention basin. The relationships of these three watersheds, as well as their sizes can be seen in Figure 1 and Table 2, respectively.

Four possible measures were analyzed to reduce sedimentation at the lake. These measures involved building a rock berm with a top elevation one half foot below the spillway crest elevation. This would allow water to flow over the berm at the lakes design elevation and encourage sediment to deposit before entering the lower portion of the lake. These measures were all located at the upper end of the lake and are laid out in the below map. Berm #1 is located at the narrowest part of the lake and could possible take advantage of a private roadways and power company right-of-way that is already cleared for construction access from the East side of the lake. Berm #1A is located slightly upstream and across the main lake body but avoids isolating some existing camping locations and takes advantage of easier construction access along the West side of the lake. Berm #2 would cross the western finger of the lake that is fed by Shop Creek and could utilize the same construction access as Berm #1A. Berm #3 is across the eastern finger of the lake and is fed by Shoal and Blue Grass Creeks but does not have easily identifiable construction access.

All four sites were analyzed for projected sedimentation rates and wetland creation acreage. Early calculations showed that Berms #2 and #3 were not practical alternatives due to existing

depths upstream of the Berms being insufficient to support long term sediment detention and short project lives.

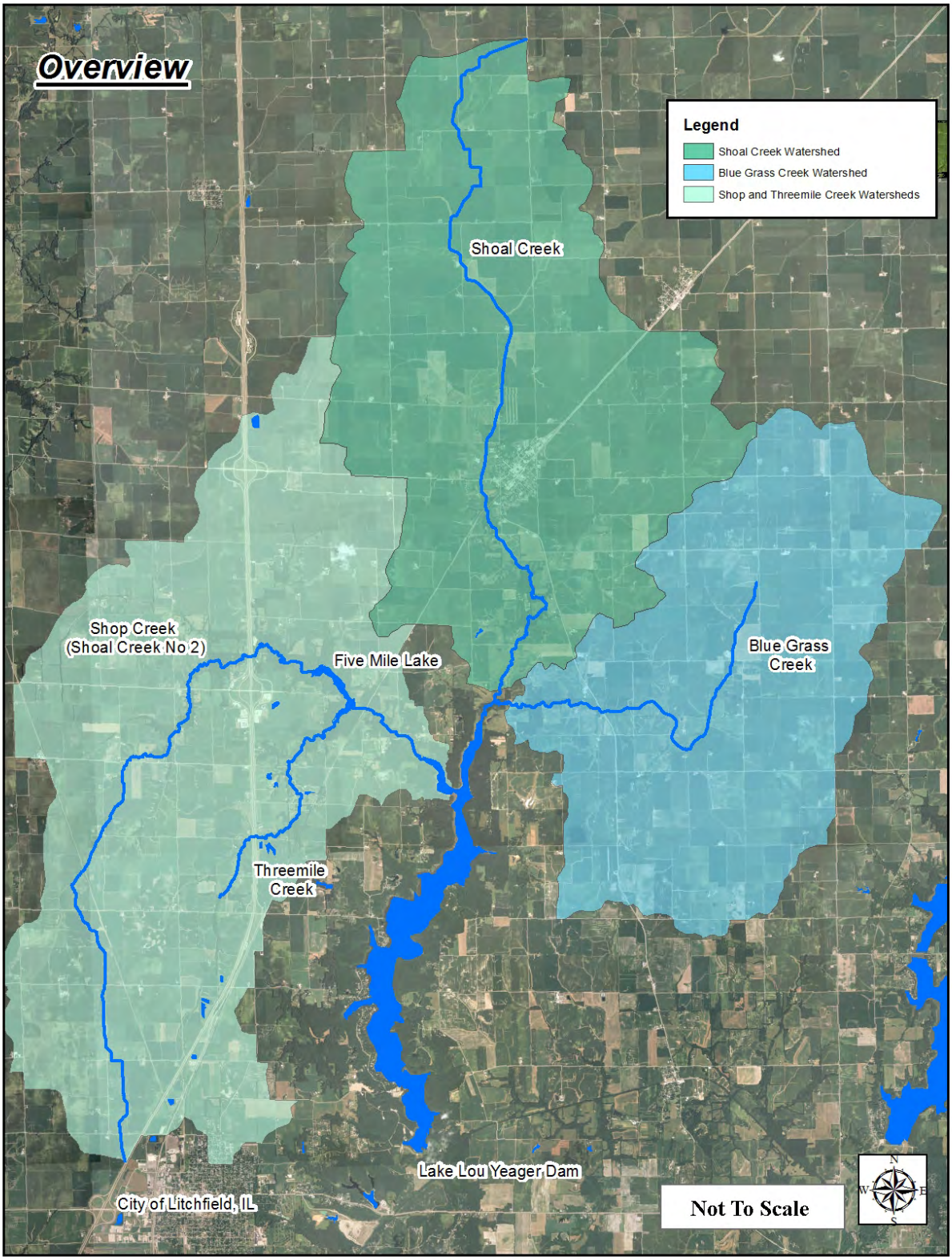


Figure 1: Lake Lou Yaeger and the tributaries and watersheds at the upper end of the lake.

Figure 2: The upper or northern end of Lake Lou Yaeger showing tributaries and locations of Berms #1 - #3

Sediment Inflow to the Lake

Various methods were considered for determining sediment inflow to the lake. Sediment data was not collected on West Fork Shoal Creek, the northern-most major tributary of the lake. This type of data was also not collected on two western major tributaries of the lake, Threemile Branch and Shop Creek. Since field-collected sediment data was not available, the possibility of calculating sediment inflow to the lake was considered. There are several empirical approaches for the estimation of erosion. Empirical approaches are derived from, or are guided by, experience or experiment. They are provable or verifiable by experience or experiment. Two of the commonly used empirical approaches are the Universal Soil Loss Equation and the Revised Universal Soil Loss Equation. The application of these two equations requires vast knowledge of the watersheds of interest. That knowledge was not available within the St. Louis District (MVS), so it was decided to request the assistance of the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS).

Several individuals in the Hillsboro, Illinois, office of the USDA NRCS were contacted and a meeting was held with these individuals at their office by project team members. The USDA NRCS in Hillsboro contacted the USDA NRCS office in Springfield, Illinois, and personnel in the Springfield office were able to provide assistance with the calculation of average annual sediment yield for portions of the lake's watershed. The USDA NRCS requested Geographic Information System information for the watersheds for which average annual sediment yield was needed (namely, shapefiles of the watersheds). Shapefiles for two watersheds was provided. The first of these watersheds was that of Bluegrass Creek, a tributary of the lake on its eastern side. Bluegrass Creek enters West Fork Shoal Creek near the upper end of the lake. The second watershed was that of West Fork Shoal Creek down to near its confluence with Bluegrass Creek. West Fork Shoal Creek enters the lake at its upper end.

A report on average annual sediment yield was produced by USDA NRCS that had separate sections for Bluegrass Creek and West Fork Shoal Creek. The USDA NRCS sediment production report is given below in APPENDIX A-1. Information from this report was used for the sedimentation analysis that was developed for this project.

After information was acquired from the USDA NRCS on average annual sediment yield for the watersheds mentioned previously, assistance was again requested of the USDA NRCS with the calculation of average annual sediment yield for another tributary watershed of the lake. This tributary was Threemile Branch, which enters the western-most arm of the two arms of the lake at its upstream end. The USDA NRCS was not able to provide assistance for Threemile Branch. Therefore, sedimentation data given in a report that was completed previously (Lake Lou Yaeger Restoration Plan - Final Report, January 1995) was used for the sedimentation analysis that was developed for Threemile Branch. This report that was completed in January 1995 was prepared by Crawford, Murphy and Tilly, Inc. (Springfield, Illinois), as a Clean Lakes Program Phase 1 Diagnostic and Feasibility Study.

Steady-Flow Hydraulic Modeling

Steady-flow hydraulic modeling of the lake was developed primarily for the purpose of determining the effects of the proposed in-lake berm upon water-surface elevations upstream of it. Citizens that live near the lake have expressed interest in the potential for the berm to produce induced flooding, which could affect their properties. The steady-flow hydraulic modeling provides a method to determine if induced flooding occurs as the result of the proposed berm, and thus a means to address the concerns of the citizens.

A report obtained from the MVS electronic files was reviewed to determine reasonable flow rates to use for the steady-flow hydraulic modeling. This report was an inspection report from the National Dam Safety Program and is entitled "Kaskaskia River Basin, Lake Lou Yaeger Dam, Montgomery County, Illinois, Inventory Number 00693, Inspection Report, National Dam Safety Program, May 1980 (Department of the Army, Chicago District, Corps of Engineers). This report identified the peak inflow rate for the flood event having a one percent chance of occurring in any given year (i.e., the so-called 100-year flood event) as 10,100 cubic feet per second (cfs). This report also has project information, engineering data, hydrology and hydraulics data, engineering drawings, visual inspection information and pictures.

However, another short report obtained from the MVS electronic files was written in April 1999 following a review of the May 1980 report. The April 1999 report contained data taken from hydrologic modeling performed with the legacy USACE computer program HEC-1. Runoff from the rainfall event having a one percent chance of occurring in any given year was calculated for five different rainfall durations (12, 18, 24, 48 and 72 hours). Peak inflow rates to the lake were given for each of these five simulations in the report, as well as peak outflow rates. The highest peak inflow rate to the lake calculated for these five simulations was about 20,300 cfs.

Based upon the information obtained for the two reports described above, eight flow rates up to and including 20,000 cfs were used in the steady-flow hydraulic modeling of the lake. It was desired to simulate a wide range of flow rates to assess the possibility of induced flooding as the result of the proposed in-lake berm. In developing the hydraulic modeling, it was assumed that each of the eight flow rates that were simulated were occurring throughout the entire lake.

An electronic representation of topography and bathymetry data for the lake and its immediate vicinity was used in the Geographic Information Systems computer program ArcMap 10.0 to develop cross sections of the lake. The cross sections (which are drawn approximately perpendicular to the direction of water flow) depict the varying elevations of the bottom of the lake, the shoreline and adjacent land. These cross sections were then transferred to the USACE Hydrologic Engineering Center River Analysis System (HEC-RAS) computer program for the calculation of steady-flow water-surface profiles for the lake. The cross sections and two proposed locations for in-lake berms are shown in Figure 3. The cross sections are drawn in black and the proposed locations for in-lake berms are dawn in gray.

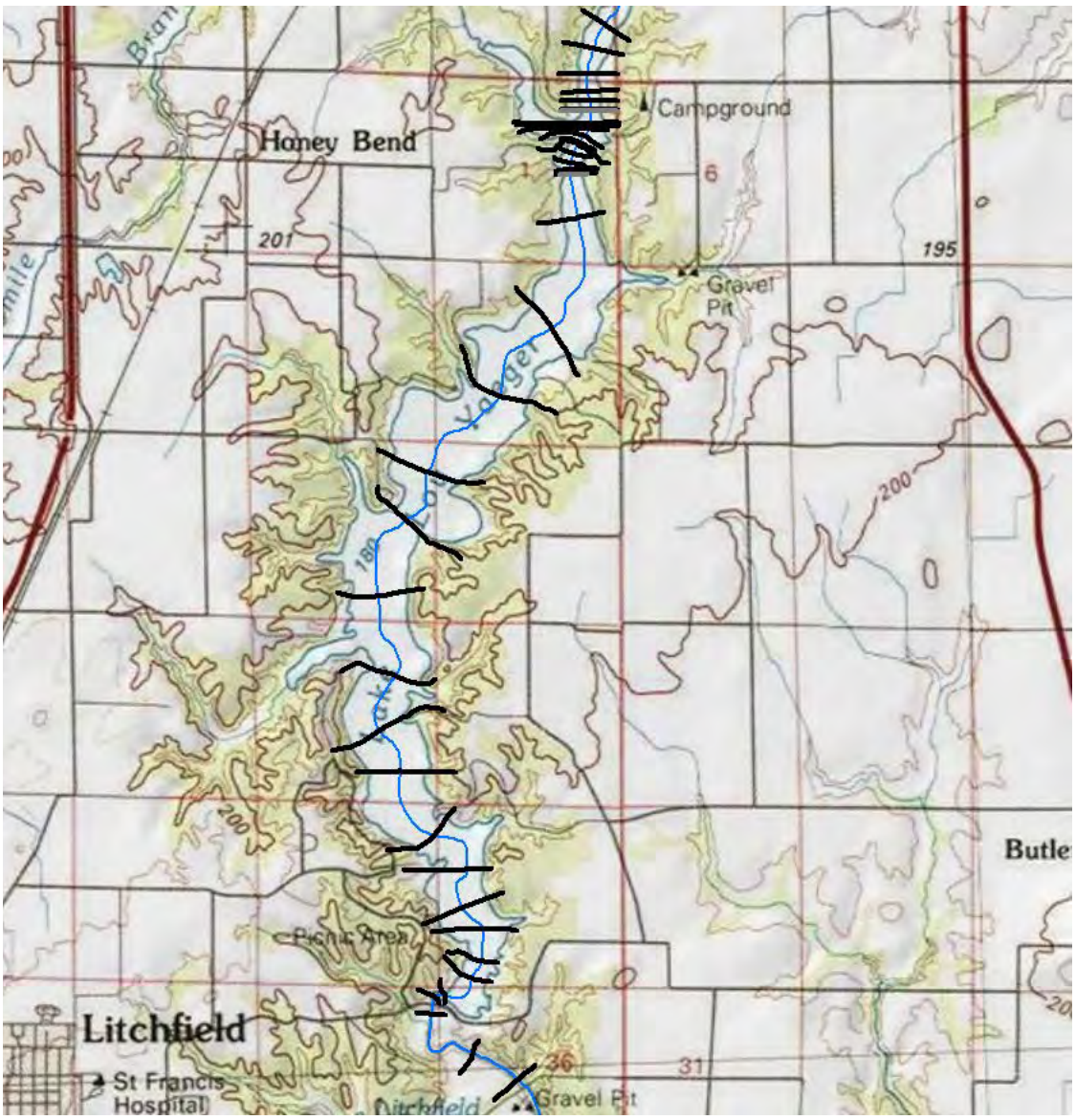


Figure 3. Cross Sections and Two Proposed Locations for In-lake Berms.

Eight flow rates (1,000; 5,000; 7,500; 10,000; 12,500; 15,000; 17,500 and 20,000 cfs) for the lake were simulated with the steady-flow computer model. In addition to the cross sections, the model includes depictions of the lake's dam and the proposed in-lake berm. The depictions of the dam and the berm are similar to that of a cross section in that the varying elevations of the structure (either dam or berm), the shoreline and the adjacent land are depicted at the locations of the dam and berm. The depictions of the dam and the berm are drawn approximately perpendicular to the direction of water flow, as are the cross sections. The depiction of the dam includes the uncontrolled spillway, which has a crest elevation of 591.0 feet (referenced to the North American Vertical Datum of 1988 (NAVD88)). The depiction of the berm has a crest

elevation of 591.0 feet NAVD88, one-half foot below the lake's uncontrolled spillway crest elevation. The geometric data that depicts the lake and its immediate vicinity (cross sections, dam, and proposed in-lake berm) is contained in a set of data known as a plan in the computer program HEC-RAS. In this plan, it was assumed that no sediment had accumulated upstream of the proposed in-lake berm.

A second plan was developed with the computer program HEC-RAS. This plan was a duplication of the first plan that was developed except that the proposed in-lake berm was removed from it. Thus, two plans (one containing the berm and one without it) were available for simulations of the eight flow rates that were described above. The lake water-surface profiles produced in simulations with the two plans were compared to determine if induced flooding was produced by the proposed in-lake berm.

The steady-flow hydraulic modeling for both plans included cross sections of the lake from the dam upstream to the proposed in-lake berm, and cross sections that extended slightly over 1,650 feet upstream of the proposed in-lake berm. There were 10 cross sections of the lake upstream of the proposed berm. The computed water-surface elevation of the lake at each of these 10 cross sections was compared for the two plans for each of the eight flow rates discussed above, yielding 80 comparisons of water-surface elevations. These comparisons showed that the largest increase in the water-surface elevation at any of the 10 cross sections for any of the eight flow rates was 0.02 feet.

Upon completion of the modeling and water-surface elevation comparisons that have been described above, it was decided to take the analysis one step further. A third plan was developed that was based upon the assumption that sediment had accumulated upstream of the proposed in-lake berm up to the crest elevation of the berm. In this plan, modifications were made to all 10 cross sections upstream of the berm to reflect the assumption that sediment had accumulated up to the crest elevation of the berm. For this plan that assumed sediment accumulation had occurred and the plan that assumed no sediment accumulation, the same comparisons of water-surface elevations upstream of the berm were made as described in the previous paragraph. These comparisons showed that the largest increase in the water-surface elevation at any of the 10 cross sections for any of the eight flow rates was 0.26 feet.

Water Flow Velocity at the In-Lake Berm

The velocity of water flow at the in-lake berm is a factor in the selection of the size of rock to use for construction of the berm. The steady-flow hydraulic modeling that was developed for the lake was used to determine average flow velocities at the in-lake berm and at the closest lake cross section upstream of the berm. In the steady-flow hydraulic modeling, it was assumed that one flow rate was occurring throughout the entire lake for each simulation that was performed. The flow rates that were simulated were based upon information in two dam safety reports for the lake. Information taken from the reports showed that the peak inflow rate to the lake for the one-percent-chance flood event in any given year (the so-called "100-year event") is about

20,300 cfs. Flow rates from 20,000 cfs down to 1,000 cfs were modeled. Also, the reports showed that the Probable Maximum Flood (PMF) peak inflow rate to the lake is about 100,050 cfs. The PMF was also modeled, as well as half of the PMF.

Average flow velocity data calculated from steady-flow hydraulic modeling is given in Table 1. The flow areas given in Table 1 represent conditions just after construction of the in-lake berm and prior to any sediment accumulation upstream of the berm. Based upon the flow velocity data in Table 1, it was decided to use a design flow velocity of 10 feet per second.

Table1: Average Flow Velocity Data Calculated from Steady-Flow Hydraulic Modeling.

		River Station 45952.00 feet in Hydraulic Modeling			River Station 45976.18 feet in Hydraulic Modeling	
Flow Rate Through Lake (cubic feet per second)		Weir Flow Area at In-Lake Berm (square feet)	Average Flow Velocity at In-Lake Berm (feet per second)		Flow Area at Cross Section (square feet)	Average Flow Velocity at Cross Section (feet per second)
1,000		983.8	1.0		2929.8	0.3
5,000		2310.2	2.2		4244.6	1.2
7,500		2924.7	2.6		4849.8	1.6
10,000		3475.0	2.9		5390.1	1.9
12,500		3976.3	3.1		5881.5	2.1
15,000		4448.0	3.4		6342.3	2.4
17,500		4890.0	3.6		6773.4	2.6
20,000		5310.6	3.8		7183.7	2.8
50,025 (0.5 PMF)		9760.2	5.1		11491.4	4.4
100,050 (1.0 PMF)		15710.8	6.4		17221.3	5.8

If work on this project is approved to move to the Plans and Specifications phase, it is recommended that unsteady-flow hydraulic modeling be developed to determine the flow

velocities at the in-lake berm. A flood event should be modeled that has an inflow hydrograph with a rapidly rising ascension side, with the initial lake elevation being that of the normal annual winter drawdown. This approach to the modeling would simulate a significant flood event entering the lake while the lake is at its lowest annual elevation, thus resulting in relatively high flow velocities at the in-lake berm.

Sedimentation Conditions of Alternatives of Lake Lou Yaeger

Current sedimentation conditions of Lake Lou Yaeger were determined using the 2011 hydrosurvey, a pre-1964 topographic survey, (NRCS) average annual sediment yield values for both Blue Grass Creek and the Upper West Fork of Shoal Creek watersheds, and average annual sediment yield value for Shop Creek from the "Restoration Plan for Lake Lou Yaeger" (January 1995). Based upon historical aerial photography from Google Earth, the upper (northern) section of Lake Lou Yaeger has been relatively shallow over the last decade. Figure 4 is an aerial photo of the lake in March of 2005. At the time the lake was in winter draw down, exposing the shallow mud bars and creek like channels.

Figure 4: Aerial photo of upper Lake Lou Yaeger during winter drawdown.

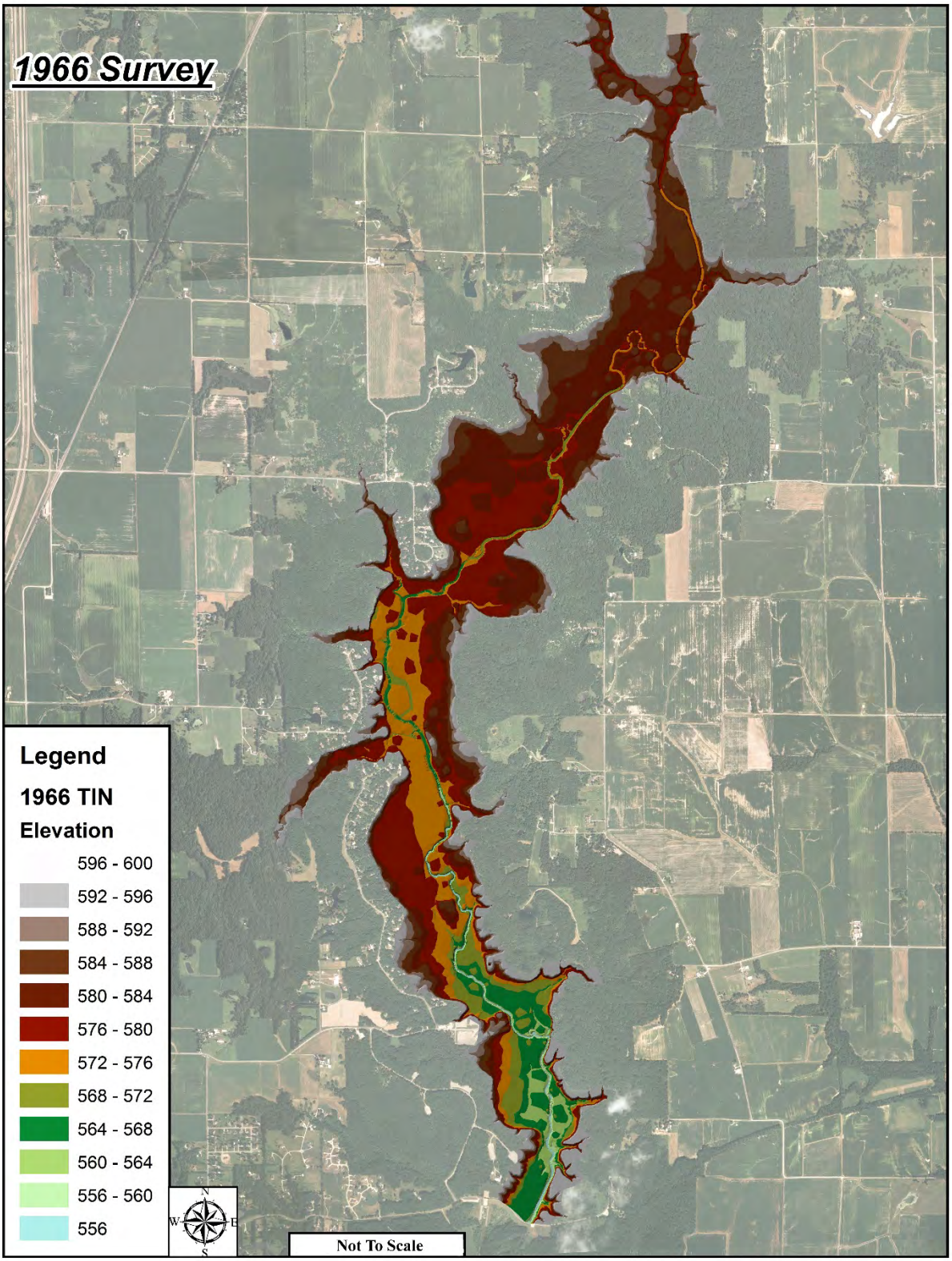

1966 Survey
Legend
1966 TIN
Elevation
596 - 600
592 - 596
588 - 592
584 - 588
580 - 584
576 - 580
572 - 576
568 - 572
564 - 568
560 - 564
556 - 560
556
N
W
E
S
Not To Scale

Figure 5: Pre-1964 Survey of the Lake Lou Yaeger basin before the reservoir was filled

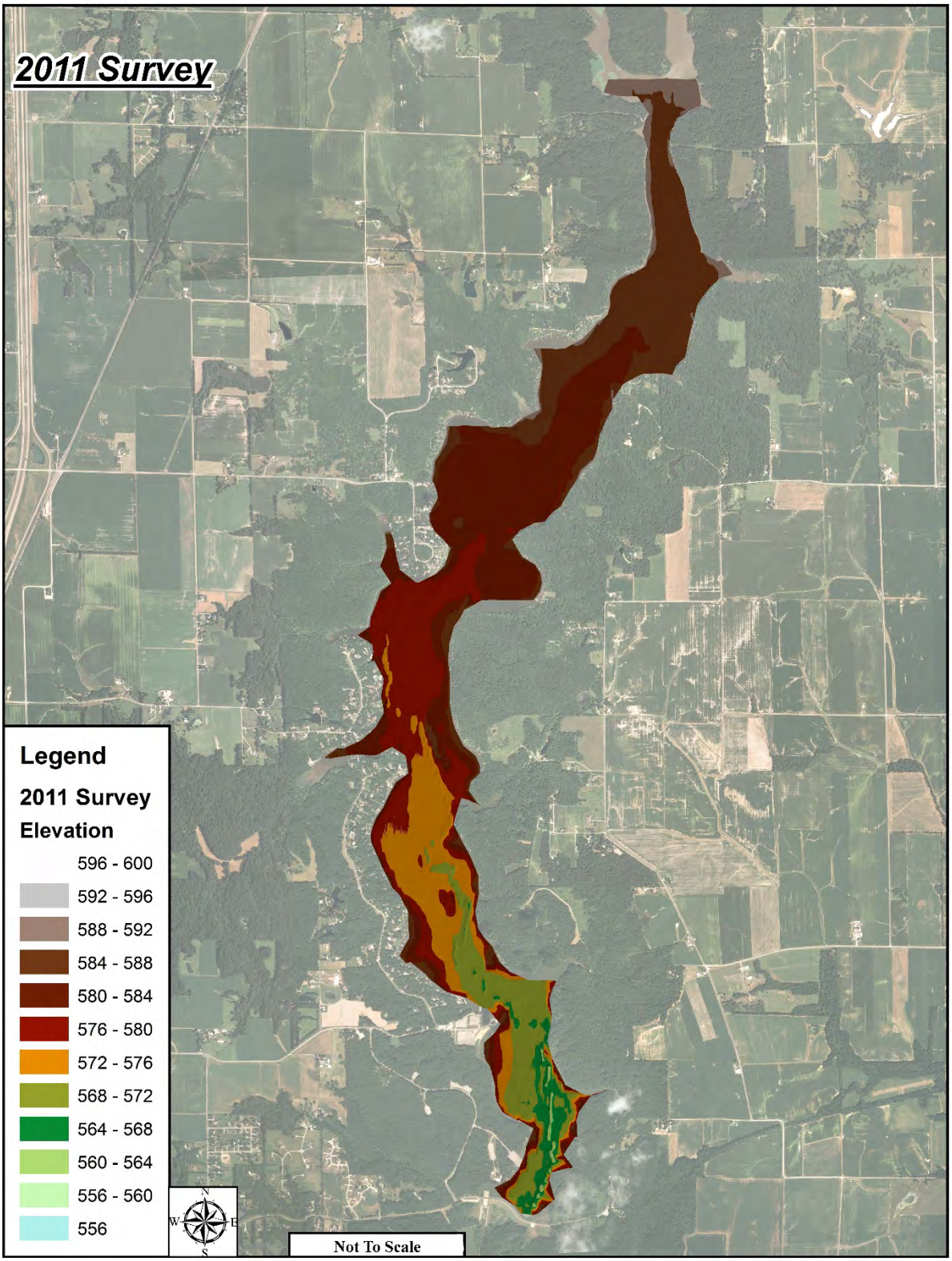


Figure 6: 2011 Bathymetric survey

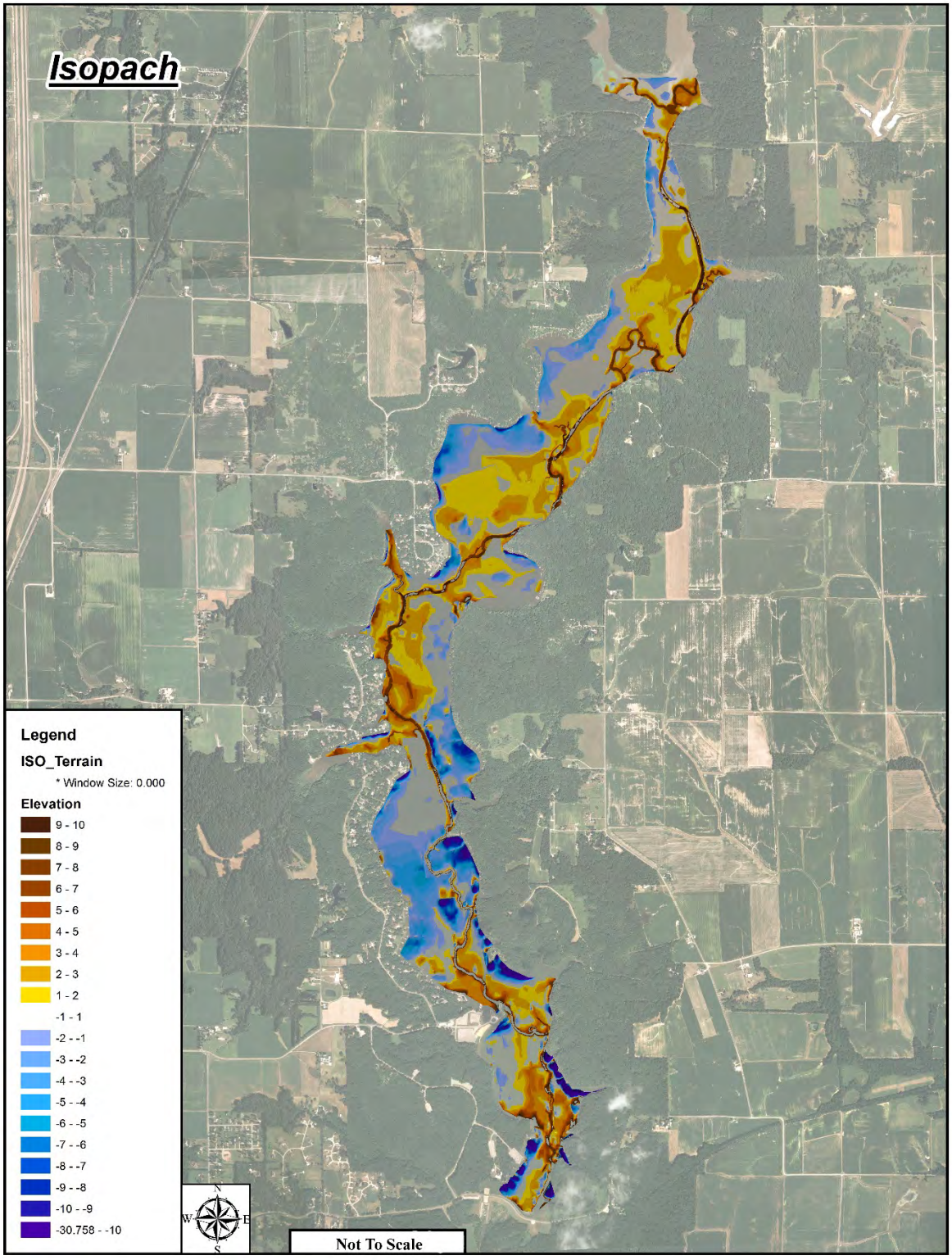


Figure 7: Isopach analysis comparing the pre-1964 and 2011 surveys. A positive number (yellow to brown) indicates an increase in bed elevation, a negative number (blue to purple) indicates a decrease in bed elevation.

The inflow of sediment for Shop Creek, formerly Shoal Creek No. 2, was referenced from the "Restoration Plan for Lake Lou Yaeger" section 1.9.2 under *Eroded Soils*. The value referenced from the report was 3.67 tons/acre/year. The inflows of sediment for Shoal Creek and Blue Grass Creek were referenced from the NRSC via email communication. For Blue Grass Creek, the value was 34,960 tons/year. For Shoal Creek, the value was 51,510 tons/year. These values were communicated to USACE in tons/year.

Table 2: The areas of the respective watersheds that were analyzed.

Watershed name	Area (acres)	Tons of clay
Shoal Creek	19756	51510
Blue grass creek	15188	34960
Shop creek	24448	89724.16

These numbers were generated from the assumption that the sediment was mostly of the clay variety. Clay was assumed as the primary sediment falling out of suspension due to section 1.2.1 in the "Restoration Plan for Lake Lou Yaeger" and visual inspection.

An Isopach analysis, as seen in Figures 5, 6 and7, which is the comparison of 2 surveys, was done to generate a sedimentation volume between Figure 6, the 2011 hydrosurvey and Figure 5, the pre-1964 topographic map (which was digitized in Arc-GIS). The pre-1964 topographic map (Figure 5) was a survey from before Lake Lou Yaeger was created. Through different conversion factors, a range was developed for the yearly sedimentation rate. The values were between 70.9 acre ft/year and 73.5 acre ft/year. The sediment inflow from these three tributaries was also roughly lower then what the "Restoration Plan for Lake Lou Yaeger" has in section 1.10.41 under *Reduction in Volume at Lake Lou Yaeger*. Therefore a ratio adjustment must be made in order to get an accurate sedimentation rate.

Table 3: The Restoration Plan for Lake Lou Yaeger report and Isopach values pertaining to the whole lake.

	Isopach	Report from 1995
Sedimentation Rate (acre ft/yr)	16.2	175.0

Conversion Ratio:

$$\frac{16.2}{175.0} = \frac{X}{70.9\ or\ 73.5}$$

This conversion ratio is used to scale the yearly inflow of sediment to what we have seen in the difference between the survey data. This was needed because the majority of the sediment inflow from these creeks passes through the site without settling out.

This yielded the corrected sedimentation range values of 6.56 to 6.79 (acre ft/yr).

From here sites 1, 1A, 2, and 3 were each run using parameters unique to their own structure placement. Sites 2 and 3 were eliminated early due to sedimentation causing a short project life. All analysis beyond this point were only completed on sites 1 and 1A.

Normal moving water surface for this section of the lake was assumed to be 592.0 ft NGVD. Volumes were found at the Lake's maximum normal water surface (elevation 591.5 ft NGVD) and at the structure height, 1 foot below normal water moving surface (elevation 591.0 ft NGVD)

Table 4: Storage volumes

BERM #1

	Storage volume (acre-ft)	Area (acre)	Storage Volume Parameter - Vs (in)
591.0 [NGVD]	151.4	122.2	14.8

	Storage volume (acre-ft)
591.5 [NGVD]	258.6

BERM #1A

	Storage volume (acre-ft)	Area (acre)	Storage Volume Parameter - Vs (in)
591.0 [NGVD]	114.7	111.1	12.4

	Storage volume (acre-ft)
591.5 [NGVD]	210.4

Between 1961 and 1990 the average annual rainfall for the Litchfield Illinois area was 38.69 inches. With this annual inflow value and the storage volume (Vs) calculated earlier, the sediment trap ratio could be determined for each of these alternatives. A Brune trap-efficiency curve was used in both alternatives to determine the sediment trap efficiency of each structure

individually. This and the equations used above was referenced from Section 15.10 on page 828-829 in Hydrologic Analysis and Design 3rd Edition by Richard H. McCuen.

Table 5: Each alternative and their sediment capture effectiveness.

	Vs/Average Annual Inflow (Yr)	Sediment Trap Efficiency (%) (WS 591.0 NGVD)	Berm #1 sediment trap effectiveness (%) (WS 591.5 NGVD)
Berm #1 and US	0.38	0.88	0.61
Whole Lake (No Berm #1)	3.63		0.946

	Vs/Average Annual Inflow (Yr)	Sediment Trap Efficiency (%) (WS 591.0 NGVD)	Berm #1A sediment trap effectiveness (%) (WS 591.5 NGVD)
Berm #1A and US	0.32	0.875	0.47
Whole Lake (No Berm #1A)	3.63		0.946

Brune trap efficiency relationship curve graphs are located in the Index item number 2 at the end of this appendix. Since the average annual inflows are roughly close, one line will be provided on the attached graph.

Based upon these sediment trap percentages and the corrected sedimentation values mentioned earlier. The calculation is a simple division of volume behind stated alternative over the sedimentation value multiplied by the sediment trap efficiency.

$$Years\ until\ Terrestrial\ creation = \frac{Volume\ behind\ Berm}{(Sediment\ Trap\ Efficency) * (Corrected\ Sedimentation\ Rate)}$$

Table 6: Years until terrestrial for each alternative

Sedimentation rate After Berm (Acre ft/yr)	4.04	4.18
Years to fill in upstream of Berm #1	37.4	36.1

Sedimentation rate After Berm (Acre ft/yr)	3.13	3.24
Years to fill in upstream of Berm #1A	36.6	35.3

For each of these alternatives there was a without structure alternative. Each of these sediment rates were calculated by using the 2011 hydrosurvey and pre-1964 topographic survey. A volume was calculated within the area behind the berm and up to the elevation of the spillway crest of the dam downstream (591.5 ft NGVD). A difference of these two volumes was then calculated and divided by the time between the two surveys. This results in an annual average sedimentation rate currently and with no structures in place. Then, the same calculation is used to calculate the life of the area behind the berms with no structure added.

Table 7: Project life of the area behind the proposed berms with no structure added.

Berm 1 (No Structure)

Pre-1964			
Z (ELV) [NGVD]	Volume (ft^3)	Surface Area (sqft)	Average Depth (ft)
591.5	9183097.3	1689485.7	5.43

2011			
Z (ELV) [NGVD]	Volume (ft^3)	Surface Area (sqft)	Average Depth (ft)
591.5	5843894.8	1711240.3	3.41
2011 (ac-ft)	134.1		
Change (ft^3)	3339202.4		
Change per year (ac-ft)	1.70		

Sedimentation rate no Berm	1.70
Years to fill in NO BERM	151.8
Years to fill in NO BERM @ Berm #1 height	88.9

Berm 1A (No Structure)

Pre-1964			
Z (ELV) [NGVD]	Volume (ft^3)	Surface Area (sqft)	Average Depth (ft)
591.5	14222175.5	2572753.9	5.52

2011			
Z (ELV) [NGVD]	Volume (ft^3)	Surface Area (sqft)	Average Depth (ft)
591.5	6964787.2	2604245.7	2.67
2011 (ac-ft)	159.8		
Change (ft^3)	7257388.3		
Change per year (ac-ft)	3.70		

Sedimentation rate no Berm	3.70
Years to fill in NO BERM	56.8
Years to fill in NO BERM @ Berm #1A height	31.0

Each alternative was then evaluated at key times during the project life: 5 years, 25 years, and 50 years. All evaluation key times were evaluated both with and without structure (berm). All of the depths are average depths and should not reflect a constant depth of the lake.

Table 8: Key point evaluation values

Berm 1		
	With Berm	No Berm
0 year volume (acre ft)	258.66	
0 year average depth (ft)	2.12	
5 year volume (acre ft)	237.72	250.14
5 year average depth (ft)	1.94	2.05
25 year volume (acre ft)	154.00	216.07
25 year average depth (ft)	1.26	1.77
50 year volume (acre ft)	84.10	173.48
50 year average depth (ft)	0.69	1.42
Sedimentation rate (acre ft/yr)	4.19	1.70

Berm 1A		
	With Berm	No Berm
0 year volume (acre ft)	210.37	
0 year average depth (ft)	1.89	
5 year volume (acre ft)	194.15	191.86
5 year average depth (ft)	1.75	1.73
25 year volume (acre ft)	129.26	117.82
25 year average depth (ft)	1.16	1.06
50 year volume (acre ft)	41.28	25.26
50 year average depth (ft)	0.37	0.23
Sedimentation rate (acre ft/yr)	3.24	3.70

The area of the lake downstream of the berm was also evaluated at the same time interval for habitat purposes. The entire lake life is also calculated. These calculations are the same type of mathematical operation as done in the previous tables.

Table 9: The results of the evaluation downstream of the berm for both alternatives.

Whole Lake Sedimentation Analysis of BERM #1

No Berm

Area	Sed Rate	0 Yr Volume	5 Yr Volume	25 Yr Volume	50 Yr Volume
1,193.8	16.18	12,782	12,701	12,378	11,973

Total Life	0 Yr Avg Depth	5 Yr Avg Depth	25 Yr Avg Depth	50 Yr Avg Depth
790.1	10.7	10.6	10.4	10.0

With Berm

Area	Sed Rate	0 Yr Volume	5 Yr Volume	25 Yr Volume	50 Yr Volume
1,193.8	13.69	12,782	12,714	12,440	12,063

Total Life	0 Yr Avg Depth	5 Yr Avg Depth	25 Yr Avg Depth	50 Yr Avg Depth
796.6	10.7	10.6	10.4	10.1

Whole Lake Sedimentation Analysis of BERM #1A

No Berm

Area	Sed Rate	0 Yr Volume	5 Yr Volume	25 Yr Volume	50 Yr Volume
1206.4	16.2	12,826	12,745	12,422	12,017

Total Life	0 Yr Avg Depth	5 Yr Avg Depth	25 Yr Avg Depth	50 Yr Avg Depth
792.8	10.7	10.6	10.3	10.0

With Berm

Area	Sed Rate	0 Yr Volume	5 Yr Volume	25 Yr Volume	50 Yr Volume
1206.4	16.6	12,826	12,743	12,410	12,001

Total Life	0 Yr Avg Depth	5 Yr Avg Depth	25 Yr Avg Depth	50 Yr Avg Depth
791.8	10.7	10.6	10.3	9.9

These results show no significant life increase from either berm in regards to sedimentation of the entire lake however the berms do increase environmental benefits upstream of their construction. In addition, Berm 1A will not be effective on trapping any additional sediment beyond what is naturally occurring upstream of this location.

During this analysis some hydraulic assumptions were made due to lack of funds and data.

1. Due to poor data management, the 2011 hydrosurvey was merged with a recent small bankline LiDAR survey to obtain more coverage of the lake; however the date of the LiDAR is unknown. For simplicity, it was assumed to be 2011.
2. It was assumed that during sediment conveyance the water surface would be 1 foot above the structure in order to adequately assume a sediment trap efficiency percentage. During design phase water surface monitoring in the area would be suggested.
3. All depths are averaged and should not be used as uniform depths.
4. Volumes in this analysis should not reflect an adequate lake volumes. Some sections of the hydrosurvey were missing banklines and back water hallows. A future survey is suggested to obtain real volume measurement.
5. Two vertical datums were used in this report due to the fact that all of the surveys (with the exception of the small bankline LiDAR) are surveyed in NVGD. Spillway crest elevation is also measured in NVGD. Therefore sedimentation analysis was performed in the NVGD datum.
6. Sediment load was assumed to be a variety clay.
7. It was assumed that all sediment that passes into Fivemile lake is transported downstream into Lake Lou Yaeger at the same rate as it arrives (Fivemile Lake is entirely filled and ineffective as a sediment trap)
8. It was assumed sediment loads from any other source besides these three creeks was Not Applicable.

Index:

APPENDIX A-1 – USDA NRCS SEDIMENT PRODUCTION REPORT

Shoal and Bluegrass Creeks Sediment Production
February 2015

This report is a follow-up to a more complete field investigation conducted on the Lake Lou Yaeger watershed in September of 1999 by NRCS (Windhorn). That report used earlier data gathered by the engineering firm of Crawford, Murphy, and Tilly, Inc. (1995) and in report Illinois State Water Survey Sedimentation Survey of Lake Lou Yaeger in November of 1977. An earlier, partial erosion inventory, was completed by SCS (now NRCS) in the late 1970's. These reports were all intended to get a quantitative idea as to how much sediment was entering this lake and from what sources. This *current* report will address estimated sediment production and transport from the Shoal Creek tributary and the Bluegrass Creek tributary. Sediment retarding basins are being considered for both of these sites.

No additional field work was completed for this report. Erosion totals for sheet and rill erosion, ephemeral erosion, gully and stream bank erosion are listed in the reports above. The main emphasis in the current report was to "partition" the erosion and sediment totals to the above mentioned tributaries. *Always important to keep in mind that all of these totals are <u>average annual ESTIMATES</u> based on vegetation, soil, geology, and surface water flow characteristics. Some of these estimates can change dramatically from year to year based on weather conditions and flow patterns.*

Shoal Creek

Shoal Creek is about 19, 756 acres in size. It is the major tributary at the northern or head-waters area of the lake. All the totals on erosion and sedimentation are contained in the documents listed above. The same values were used to compute sediment delivery to the outlet end with some adjustments for individual types of erosion and their Sediment Delivery Rates. (SDR)

Shoal Creek had a total annual erosion rate of 87,075 tons. Of that total, 1% (1,100T) is attributed to stream bank erosion, 4% (3,400T) for gully erosion, 13% (10,800 T) to ephemeral erosion and the rest 82% (71,775 T) to sheet and rill erosion. Applying SDR rates to "convert" erosion into sediment, Shoal Creek produces about **51,510 tons of sediment** delivered to the outlet on an average annual basis. This figures to be **2.6 Tons** of sediment /Acre/Year delivered to the outlet of the creek.

Blue Grass Creek

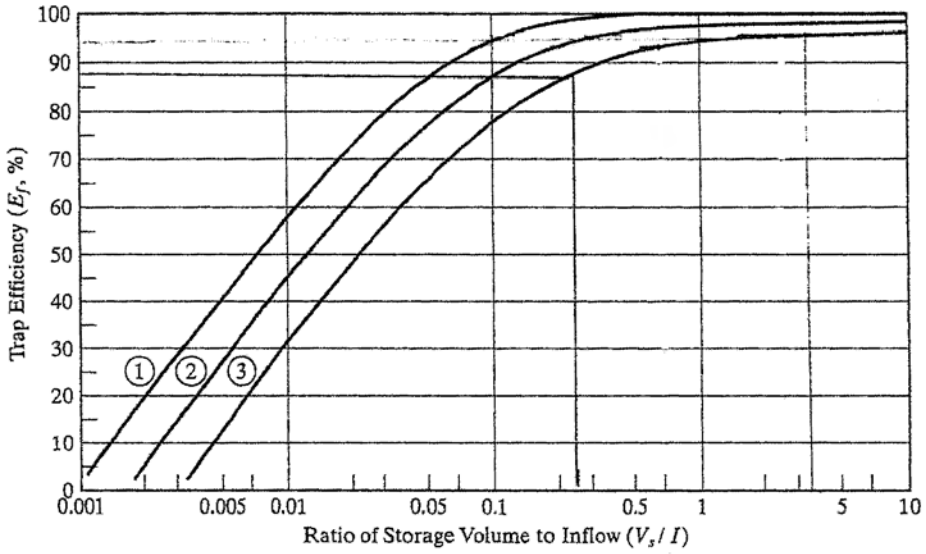
Blue Grass Creek is about 15,188 acres in size and lies to the northeast side of Lake Lou Yaeger. As discussed above, the totals for erosion and sediment in this watershed came directly from the detailed report completed in 1999.

Blue Grass Creek had a total annual erosion rate of 60,000 T. One percent of that (500 T) is from stream bank erosion, 2% (1400 T) came from gully erosion, 11% (6,700 T) from ephemeral erosion, and 86% (51,400 T) from sheet and rill erosion. Applying the SDR rates to Blue Grass Creek produces about **34,960 tons of sediment** delivered to the outlet on an average annual basis. This figures to be about **2.3 Tons** of sediment/ Acre/ Year delivered to the outlet.

Errata: The Sediment Delivery Rates (SDR) in the 1999 report used an SDR of 0.75 for all Sheet and Rill erosion rates. This value originated in the earlier engineering report by Crawford, Murphy and Tilley, Inc. when they applied it to their data. I believe the SDR of 0.75 gives an apparent transport rate and sediment volume that is excessive for the Sheet and Rill erosion on the 0-5% slopes in these watersheds. Therefore, the totals listed above were adjusted to a more appropriate rate of 0.55. Sediment delivery rates for an entire watershed of this size are a good first-order estimate, but never meant to be a highly repeatable quantitative value.

Roger D. Windhorn
Geologist, NRCS

APPENDIX A-2 – BRUNE TRAP EFFICIENCY RELATIONSHIP GRAPH



Brune trap-efficiency relationship for (1) primary highly flocculated and coarse-grained sediments, (2) median-grained sediments, and (3) primarily colloidal and dispersed fine-grained sediments.

Appendix B - General Engineering

1. GENERAL DESIGN CONSIDERATIONS

The proposed project is composed of the design of an in-lake sediment detention basin that will capture silt and increase the amount of aquatic wetlands. Three sites named 1, 2, and 3 were proposed from the initial investigation of aerial imagery and were determine by topography to minimize the length of the structure. A fourth site named 1A was recommended to the project team by the sponsor based on the concern of access and the need for a reduced amount of real estate acquisition.

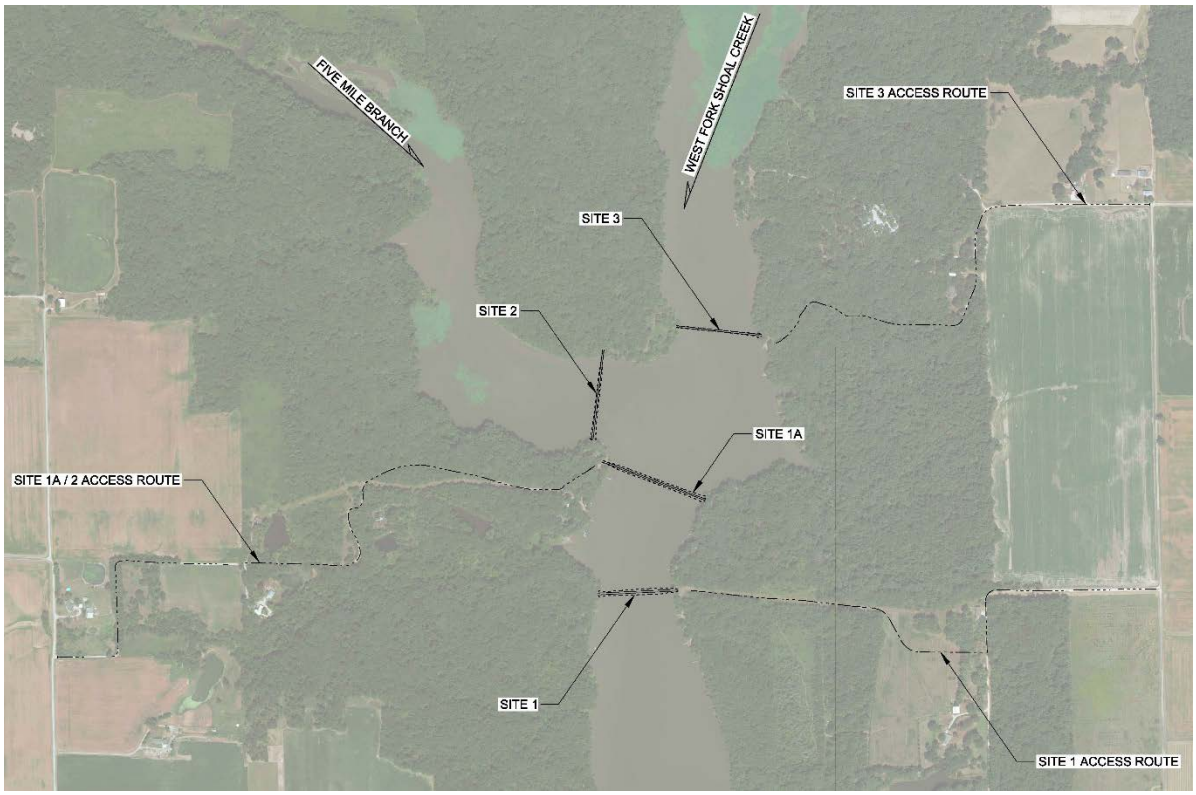


Figure 1: Site Locations

Figure 2: Site 1 Bankline

Figure 3: Site 1A Bankline

2. CONSTRUCTABILITY CONSIDERATIONS

2.1 Construction Access

The shoreline of the upper portion of Lake Lou Yaeger remains undeveloped with the exception of various camp sites with docks that are most only accessible by boat. The area is densely vegetated and the terrain near the lake is uneven. One of the major goals of the project was to minimize the impact to the existing ecosystem and existing cleared areas were explored for site access.

2.1.1 Site 1 Access

The proposed access to site 1 uses an existing road, a pasture, and a clearing in the vegetation for an electric line. The existing road is named Privacy Lane which is a privately owned gravel road that connects 3 residences to County Road 650 East. It is assumed that Privacy Lane will require improvement to sustain the transport of construction equipment and improvement upon completion of construction to restore the road to existing conditions. The remaining segment of access road will require the construction of a temporary gravel road across a pasture and existing clearing for an electric line that is an overhead line and turns into a buried line approximately 700 feet east of the lake. The access road will require grading to meet the maximum slopes allowed for construction equipment in EM 385-1-1 Section 4 and will also require a culvert to allow for drainage through a gulley during rain events. The width of the haul route is constrained by the terrain, vegetation and the powerline. The contractor will have room to construct turnouts or wider sections of haul route to allow for 2 way traffic passage but a full 2 way haul route would require the removal of long stretches of vegetation which will be avoided. The contractor will also need a method of communication between vehicles or a control plan to coordinate traffic through constrained areas. The access road will also require a temporary construction easement for approximately 1.3 acres of land

Figure 4: Site 1 Access Route

2.1.2 Sites 1A & 2 Access

The proposed access to sites 1A and 2 uses an existing road. The existing road is named Cemetery Lane which is a gravel road that connects 2 residences and a several of the lakes west bank camping sites to East 5th Road. Cemetery Lane is partially located on private land and the sponsor's property. It is assumed that the entire length of Cemetery Lane will require improvement to sustain the transport of construction equipment and improvement upon completion of construction to restore the road to existing conditions. At some locations the access road would require to allow for the passage of large construction equipment. The access road will also require a permanent construction easement for approximately 1.4 acres of land.

Figure 5: Sites 1A&2 Access Route

2.1.3 Site 3 Access

The proposed access to sites 3 uses an existing road and path to a boat ramp on the lake shoreline. The existing road is named North 18th Avenue which is a gravel road that connects several residences to County Road 650 East. North 18th Avenue is located on private land. It is assumed that the entire length of North 18th Avenue will require improvement to sustain the transport of construction equipment and improvement upon completion of construction to restore the road to existing conditions. The remaining segment of access road will require the construction of a temporary gravel road through an existing path through the wood line. A site visit to determine the condition of the road and path was not conducted because site 3 was eliminated from consideration prior to a site visit being completed.

2.2 Rock Berm Design Considerations

The results from the average flow velocity data calculated from steady-flow hydraulic modeling was used to determine the design average flow velocity. A wide range of flow

rates moving through the lake were modeled. The selected design velocity was 10 feet per second. This is an average flow velocity was used for initial riprap sizing. However, unsteady-flow hydraulic modeling of a flood event is recommended to better determine the flow velocities at the in-lake berm. It is recommended that unsteady-flow hydraulic modeling of a significant flood event entering the lake be developed for the case in which the lake elevation is at the level of the annual winter drawdown. This case may result in the highest likely flow velocity at the in-lake berm.

The product delivery team referenced EM 1110-2-1601, "Hydraulic Design of Flood Control Channels" for designing the in-lake berm riprap. It was assumed that this scenario would also develop turbulent flows within the in-lake berm.

The proposed riprap gradation selected by the product delivery team was a 1000 pound top size gradation. The riprap meets gradation requirements of LMVD, "Report on Standardization of Riprap Gradation," revised March 1989. Gradation of riprap material is as follows:

1000-Pound Top Size Riprap

Percent Lighter by Weight	Limits of Stone Weight, lb.
100	1000-400
50	430-200
15	210-60

Given the assumption that the lake bottom is comprised of soft sediments, a bedding filter layer was not designed. The product delivery team expects that during placement of the required riprap quantities that a filter layer would be lost into the soft lake bottom. This would make the filter layer ineffective. Furthermore, it was assumed that 50% of the riprap volume placed for the in-lake berm would be lost or settle into the lake bottom during construction.

The proposed design for the in-lake berm is to have a 10 foot wide crown and 1V:3H slopes. The 10 foot crown was selected to allow for the construction of the berm in wet conditions. It is assumed that the contractor will dump the required large stone with a smaller choke stone on top starting on one side of the lake and working across until the in-lake berm is complete. For quantity analysis it was assumed that up to 50% of the stone could settle into the lake bed during the construction of the berm. Therefore this additional material was factored into the quantities that were used to determine the cost estimate of the structure.

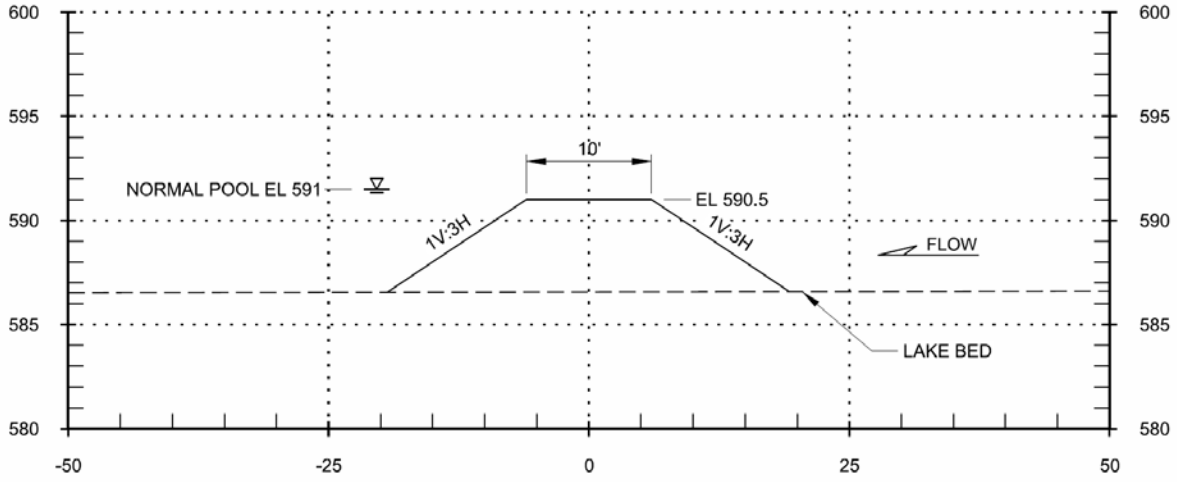


Figure 6: Typical Section

The top elevation of the in-lake berm is designed to be elevation 590.5 NAVD 88 based on hydraulic consideration. The elevation 591 NAVD 88 is 0.5 feet below the spillway elevation of the dam. The structure ties into the bank at elevation 596 NAVD 88 with a 1V:10H slope to keep the structure from being flanked during a high water event as shown in the figure below.

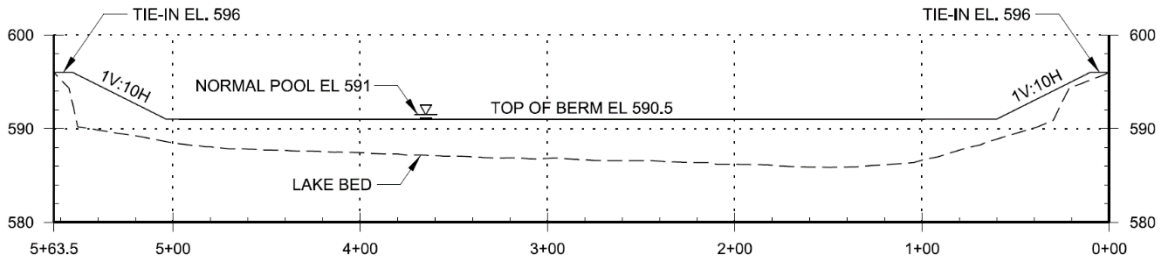


Figure 7: Site 1 Profile

2.3 Bankline Revetment

The bankline revetment was designed using ASCE Manuals and Reports on Engineering Practice No. 124: Inland Navigation Channel Training Works. The rock berm tie-in was similar to a dike bankhead and the bank paving option was more favorable then a root tie-in examples shown in Chapter 5. To determine the amount of downstream revetment the report suggests using the bank height multiplied by 3 for average conditions. The bank height of 8 feet was assumed to be the bottom of revetment key-in to the top of the structure tie-in. This

resulted in 24 feet which was rounded up to 25 feet of downstream paving. The report recommended the upstream paving not exceed the bank height therefore the 8 feet was rounded up to 10 feet. The revetment typical section is shown in the figure below.

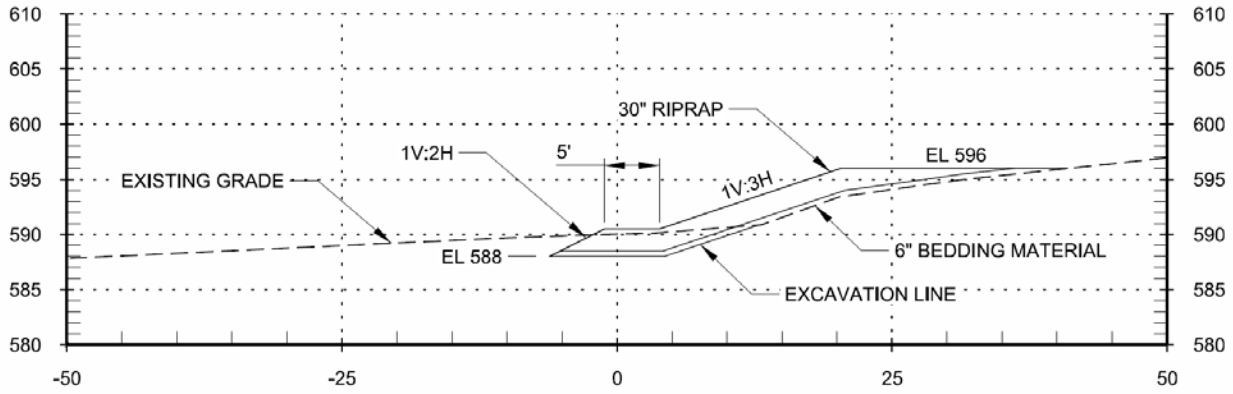


Figure 8: Revetment Typical Section

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WETLAND RESTORATION PROJECT

CITY OF LITCHFIELD

MONTGOMERY COUNTY, ILLINOIS

XXXXX XX, 2016

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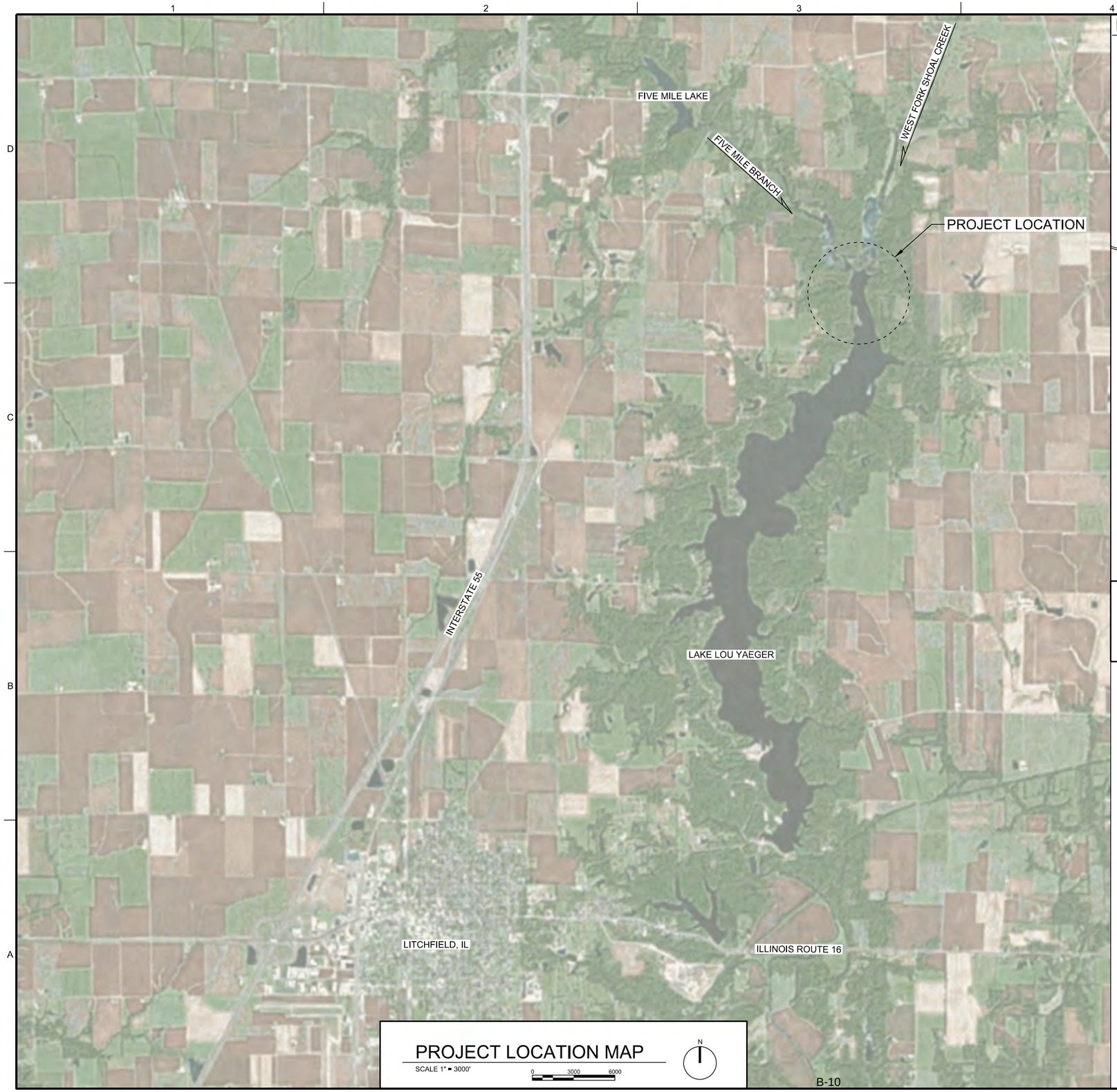
COVER SHEET

PLATE
G-001



PROJECT LOCATION MAP

SCALE 1" = 3000'

0 3000 6000

N

VICINITY MAP

SCALE: NTS

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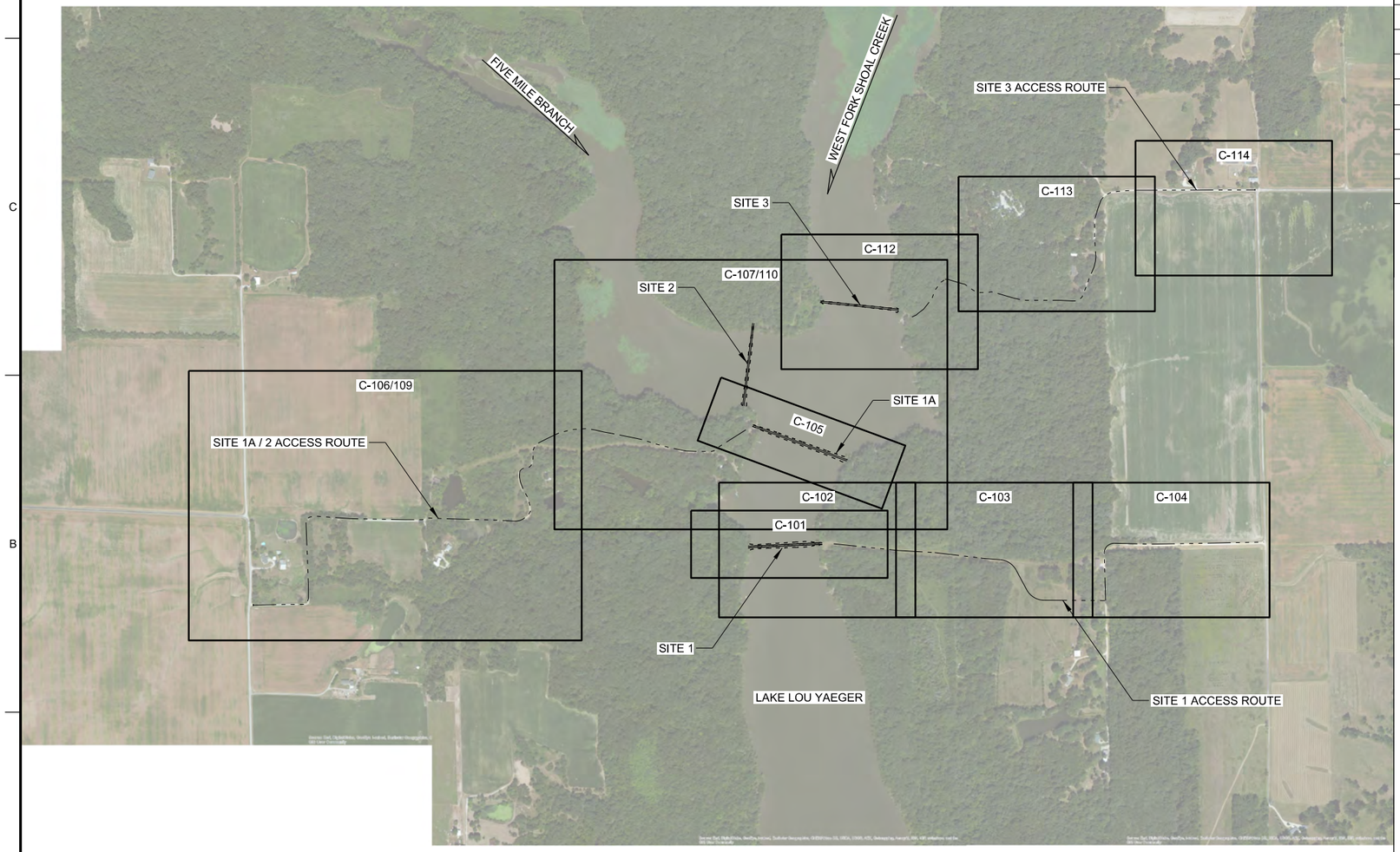
LITCHFIELD, ILLINOIS

PROJECT LOCATION AND VICINITY MAP

PLATE
G-002

SHEET NO.	TITLE
	GENERAL
G-001	COVER SHEET
G-002	PROJECT LOCATION AND VICINITY MAPS
G-003	INDEX OF DRAWINGS
	CIVIL
C-101	SITE 1 PLAN AND PROFILE
C-102	SITE 1 ACCESS PLAN SHEET 1 OF 3
C-103	SITE 1 ACCESS PLAN SHEET 2 OF 3
C-104	SITE 1 ACCESS PLAN SHEET 3 OF 3
C-105	SITE 1A PLAN AND PROFILE
C-106	SITE 1A ACCESS PLAN SHEET 1 OF 2
C-107	SITE 1A ACCESS PLAN SHEET 2 OF 2
C-109	SITE 2 ACCESS PLAN SHEET 1 OF 2
C-110	SITE 2 ACCESS PLAN SHEET 2 OF 2
C-112	SITE 3 ACCESS PLAN SHEET 1 OF 3
C-113	SITE 3 ACCESS PLAN SHEET 2 OF 3
C-114	SITE 3 ACCESS PLAN SHEET 3 OF 3
C-301	TYPICAL SECTIONS



SHEET INDEX MAP

SCALE 1" = 500'

0 500 1000

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SHEET INDEX

PLATE
G-003

GENERAL SHEET NOTES

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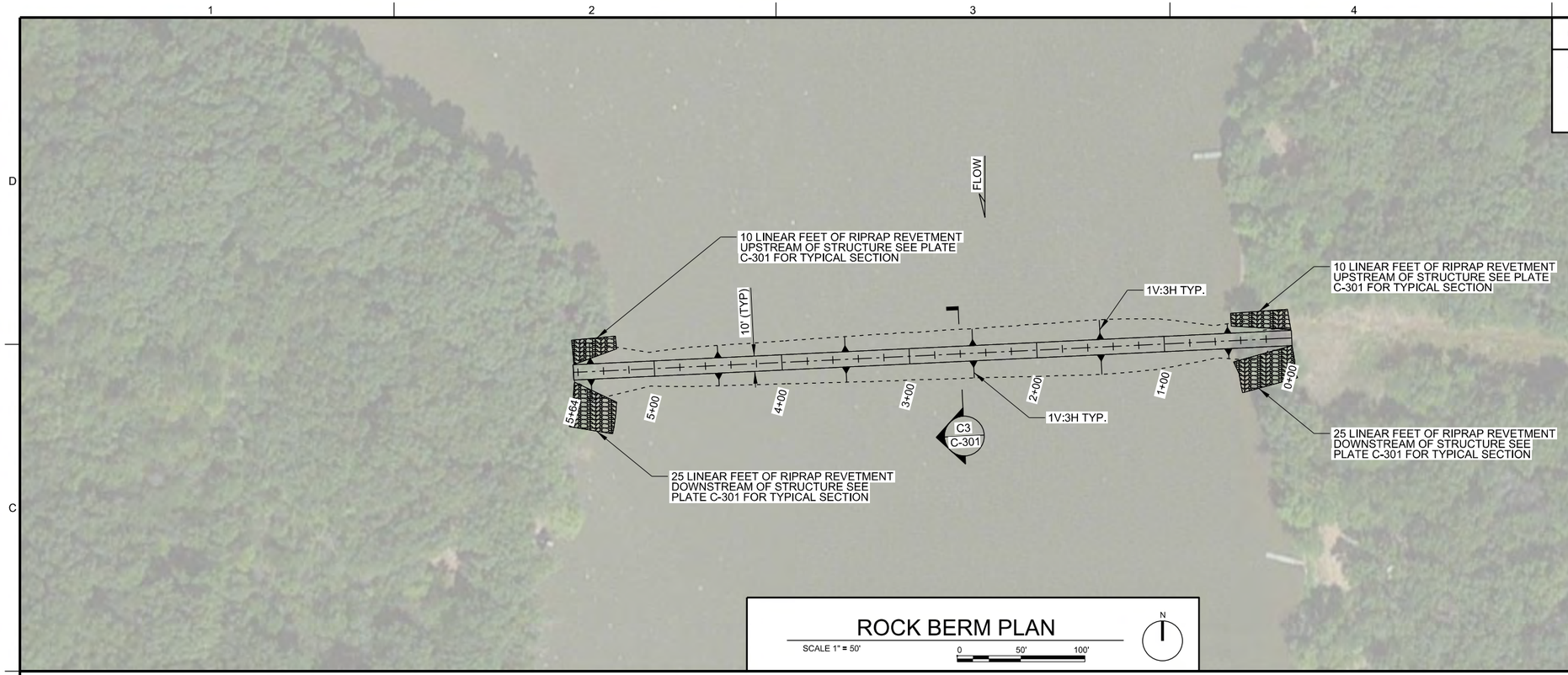

ROCK BERM PLAN

SCALE 1" = 50'

0 50' 100'

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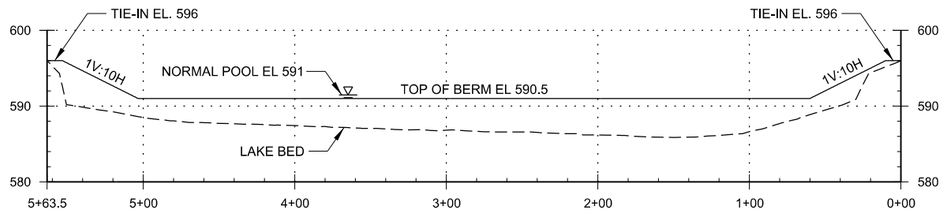

ROCK BERM PROFILE

HORIZ. SCALE 1" = 50' 0 50' 100'

VERT. SCALE 1" = 10' 0 10' 20'

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SITE 1 PLAN AND PROFILE

PLATE
C-101

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 1 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.3 ACRES
2. UTILITY LOCATIONS ARE APPROXIMATE

BURIED ELECTRIC AND JUNCTION BOX (LOCATIONS ARE APPROXIMATE)

CONSTRUCTION LIMITS LOCATED WITHIN LAKE PROPERTY

20' RIGHT OF WAY FOR TEMPORARY ACCESS ROAD WITHIN LAKE PROPERTY LIMITS

OVERHEAD ELECTRIC AND UTILITIES POLES (LOCATIONS ARE APPROXIMATE)

12' GRAVEL ROAD

MINIMAL BRUSH CLEARING ALONG SOUTH EDGE OF RIGHT OF WAY

CONTRACTOR STAGING AREA

MINIMAL TREE CLEARING FOR ROCK BERM AND REVETMENT CONSTRUCTION

0.1 ACRES OF TREE CLEARING REQUIRED FOR ROCK BERM AND REVETMENT CONSTRUCTION

MATCH LINE
SEE SHEET C-103

ACCESS PLAN

SCALE 1" = 50'

0 50' 100'

N

B-13

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SITE 1 ACCESS PLAN
SHEET 1 OF 3

PLATE
C-102

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 1 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.3 ACRES
2. UTILITY LOCATIONS ARE APPROXIMATE

MATCH LINE
SEE SHEET C-102

APPROXIMATE LAKE PROPERTY LINE

20' RIGHT OF WAY FOR TEMPORARY ACCESS ROAD WITHIN LAKE PROPERTY LIMITS

EXPANDED RIGHT OF WAY FOR CULVERT AND SLOPES OF FILL (APPROXIMATE LOCATION)

OVERHEAD ELECTRIC AND UTILITIES POLES (LOCATIONS ARE APPROXIMATE)

CULVERT TO BE PLACE IN EXISTING DITCH FOR CONSTRUCTION ACCESS ROAD SEE TYPICAL SECTION ON SHEET C-301

20' RIGHT OF WAY FOR TEMPORARY ACCESS ROAD

12' GRAVEL ROAD

MATCH LINE
SEE SHEET C-104

ACCESS PLAN

SCALE 1" = 50'

0 50' 100'

N

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SITE 1 ACCESS PLAN
SHEET 2 OF 3

PLATE
C-103

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 1 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.3 ACRES

ACCESS PLAN

SCALE 1" = 50'

0 50' 100'

N

B-15

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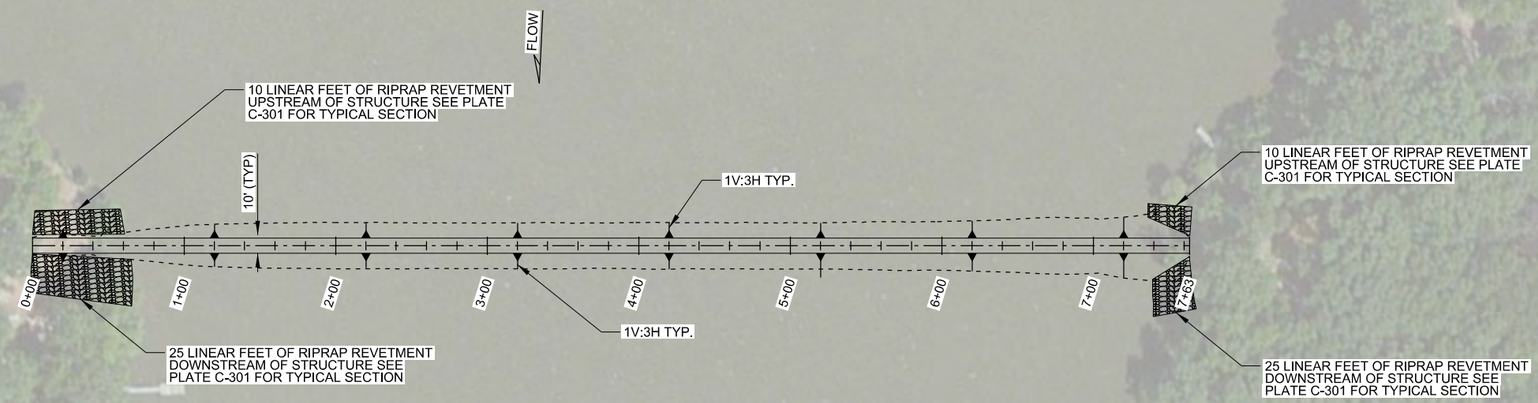
SITE 1 ACCESS PLAN
SHEET 3 OF 3

PLATE
C-104

GENERAL SHEET NOTES

1. ALL ELEVATIONS ARE IN NORTH AMERICAN VERTICAL DATUM (N.A.V.D. 88)

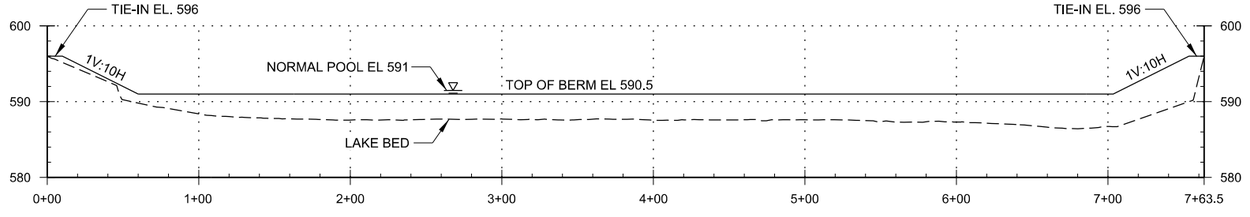


ROCK BERM PLAN

SCALE 1" = 50'

0 50' 100'

N



ROCK BERM PROFILE

HORIZ. SCALE 1" = 50' 0 50' 100'

VERT. SCALE 1" = 10' 0 10' 20'

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SITE 1A PLAN AND PROFILE

PLATE
C-105

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 1A TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.5 ACRES

MATCH LINE
SEE SHEET C-107

RIGHT OF WAY TO FOLLOW EDGE OF CEMETARY LANE

E 5TH RD

APPROXIMATE COUNTY PROPERTY LINE

CEMETARY LANE

ACCESS PLAN

SCALE 1" = 100'

0 100' 200'

N

B-17

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MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 1A ACCESS PLAN
SHEET 1 OF 2

PLATE
C-106

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 1A TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.5 ACRES
2. UTILITY LOCATIONS ARE APPROXIMATE

RIGHT OF WAY TO FOLLOW EDGE OF CEMETARY LANE

CEMETARY LANE

RIGHT OF WAY FOR TEMPORARY ACCESS WITHIN LAKE PROPERTY LIMITS

STAGING AREA ALONG EXISTING PATH, CLEARING NOT ALLOWED

MINIMAL TREE CLEARING REQUIRED FOR ROCK BERM AND REVETMENT CONSTRUCTION

0.1 ACRES OF TREE CLEARING REQUIRED FOR ROCK BERM AND REVETMENT CONSTRUCTION

OVERHEAD ELECTRIC (LOCATION APPROXIMATE)

UNDERGROUND ELECTRIC (LOCATION APPROXIMATE)

APPROXIMATE LAKE PROPERTY LINE

P L

C/L

MATCH LINE
SEE SHEET C-106

ACCESS PLAN

SCALE 1" = 100'

0 100' 200'

N

B-18

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SITE 1A ACCESS PLAN
SHEET 2 OF 2

PLATE
C-107

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 2 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.5 ACRES

MATCH LINE
SEE SHEET C-110

RIGHT OF WAY TO FOLLOW EDGE OF CEMETARY LANE

E 5TH RD

APPROXIMATE COUNTY PROPERTY LINE

CEMETARY LANE

C/E

ACCESS PLAN

SCALE 1" = 100'

0 100' 200'

N

B-19

US Army Corps of Engineers®

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ST. LOUIS, MISSOURI 63103

DESIGNED BY:		DATE:	
DWN BY:	CKD BY:	SOLICITATION NO.:	
SUBMITTED BY:		CONTRACT NO.:	
PLOT SCALE: 1:1	PLOT DATE:	FILE NUMBER:	
SIZE: ANSI D	FILE NAME: L1Y_C-109.dgn		

LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 2 ACCESS PLAN
SHEET 1 OF 2

PLATE
C-109

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 2 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.5 ACRES
2. UTILITY LOCATIONS ARE APPROXIMATE

0.1 ACRES OF TREE CLEARING REQUIRED FOR ROCK BERM AND REVETMENT CONSTRUCTION

MINIMAL TREE CLEARING REQUIRED FOR ROCK BERM AND REVETMENT CONSTRUCTION

STAGING AREA ALONG EXISTING PATH, CLEARING NOT ALLOWED

RIGHT OF WAY TO FOLLOW EDGE OF CEMETARY LANE

RIGHT OF WAY FOR TEMPORARY ACCESS WITHIN LAKE PROPERTY LIMITS

CEMETARY LANE

OVERHEAD ELECTRIC (LOCATION APPROXIMATE)

UNDERGROUND ELECTRIC (LOCATION APPROXIMATE)

APPROXIMATE LAKE PROPERTY LINE

MATCH LINE
SEE SHEET C-109

ACCESS PLAN

SCALE 1" = 100'

0 100' 200'

N

B-20

US Army Corps of Engineers®

ATR

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

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ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI 63103

DESIGNED BY: | DATE:
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LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 2 ACCESS PLAN
SHEET 2 OF 2

PLATE
C-110

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 3 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.4 ACRES

EXISTING VEHICLE PATH TO BE IMPROVED FOR CONSTRUCTION ACCESS

RIGHT OF WAY FOR TEMPORARY ACCESS WITHIN LAKE PROPERTY LIMITS

0.1 ACRES OF TREE CLEARING REQUIRED FOR ROCK BERM AND REVETMENT CONSTRUCTION

MINIMAL TREE CLEARING FOR CONTRACTOR STAGING AND ROCK BERM AND REVETMENT CONSTRUCTION

APPROXIMATE LAKE PROPERTY LINE

MATCH LINE
SEE SHEET C-113

P L

C/E

C/E

ACCESS PLAN

SCALE 1" = 50'

0 50' 100'

N

B-21

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PLOT SCALE: 1=1	PLOT DATE:	FILE NUMBER:	
SIZE: ANSI D	FILE NAME: L1V_C-112.dgn		

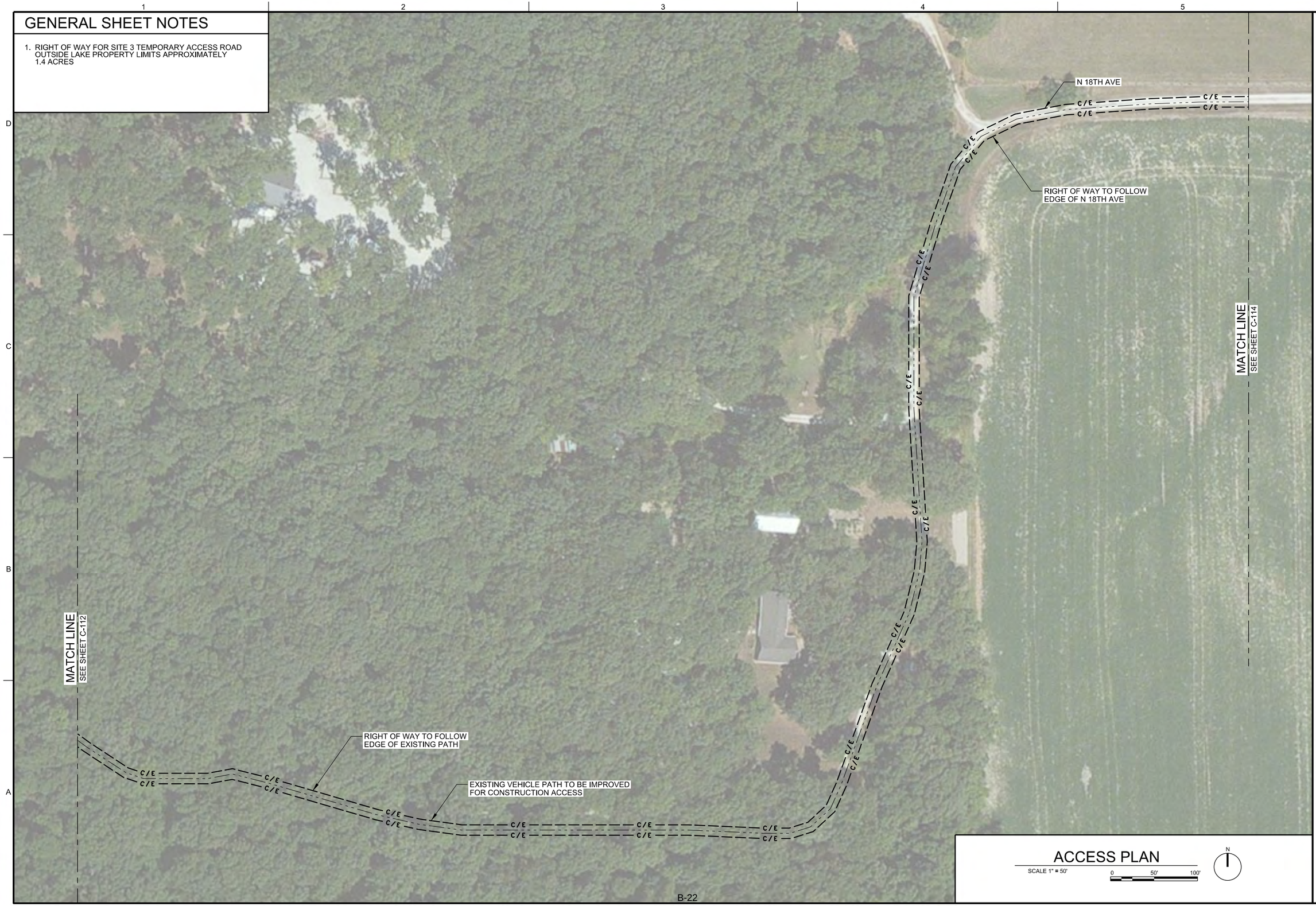
LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 3 ACCESS PLAN
SHEET 1 OF 3

PLATE
C-112

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 3 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.4 ACRES



ACCESS PLAN

SCALE 1" = 50'

0 50' 100'

N

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LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 3 ACCESS PLAN
SHEET 2 OF 3

PLATE
C-113

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 3 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.4 ACRES

ACCESS PLAN

SCALE 1" = 50'

0 50' 100'

N

B-23

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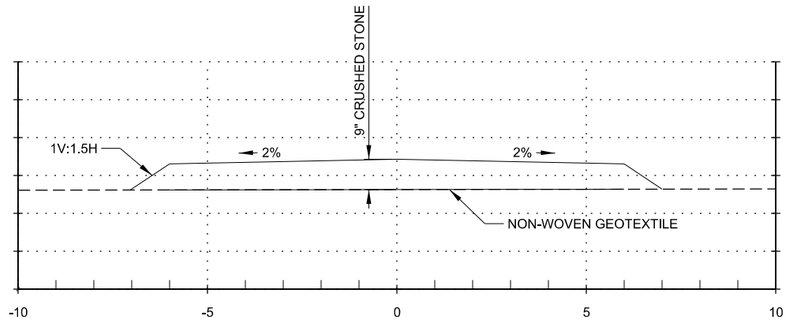
LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 3 ACCESS PLAN
SHEET 3 OF 3

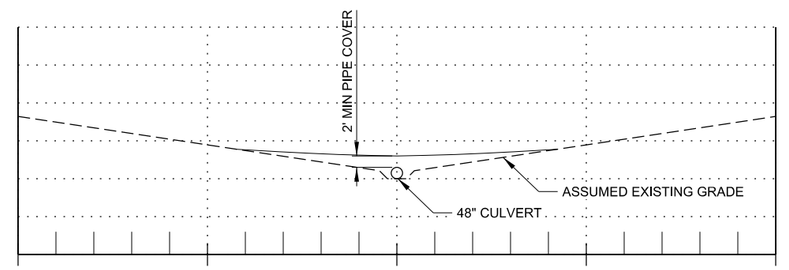
PLATE
C-114

GENERAL SHEET NOTES

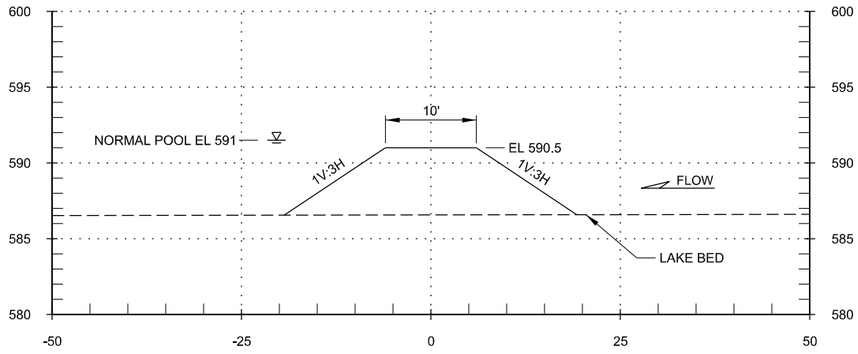
1. ELEVATIONS ARE IN NORTH AMERICAN VERTICAL DATUM (N.A.V.D. 88)



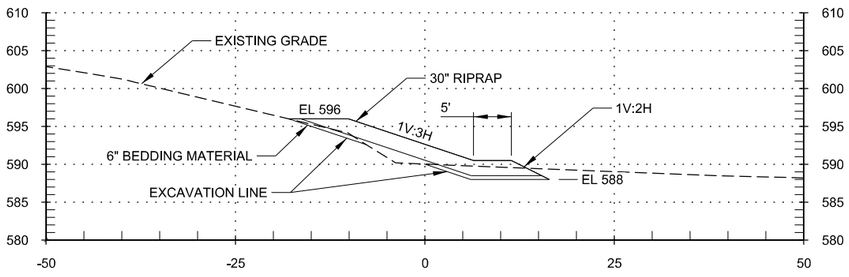
B3 ACCESS ROAD TYPICAL SECTION
SCALE NTS



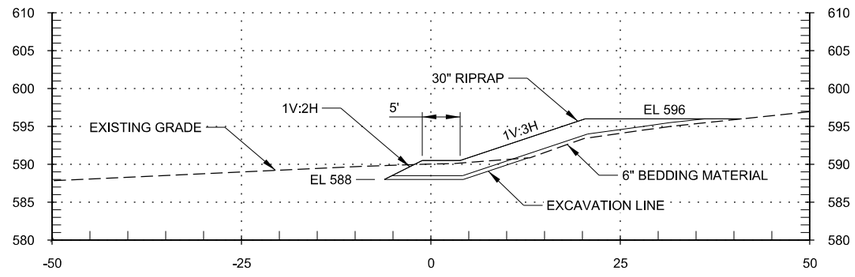
B3 ACCESS ROAD DITCH CROSSING
SCALE NTS



C3 ROCK BERM SECTION
HORIZ. SCALE 1" = 10' 0 10' 20' VERT. SCALE 1" = 5' 0 5' 10'



C2 WEST BANK REVETMENT
SCALE 1" = 10' 0 10' 20'



C4 EAST BANK REVETMENT
SCALE 1" = 10' 0 10' 20'

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PLOT SCALE: 1:1
PLOT DATE:
SIZE: ANSI D
FILE NAME: L1V_C-301.dgn

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LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

TYPICAL SECTIONS

PLATE
C-301

Appendix C

Habitat Evaluation & Quantification

Habitat Evaluation & Quantification Appendix C

1. Introduction

This appendix provides the documentation of the habitat evaluation and quantification process that was conducted to evaluate the benefits of various habitat features for the Lake Lou Yeager Section 206, Continuing Authorities Program, Aquatic Ecosystem Restoration Project (LLY). Active participants included an aquatic ecologist, a wildlife biologist, and a hydraulic engineer from the St. Louis District Corps of Engineers. The U.S. Fish and Wildlife Service (USFWS; Marion Illinois Ecological Services Office) and the Illinois Department of Natural Resources were consulted regarding the habitat evaluation, but passed on the opportunity to participate due to resource issues (Table 1). The USFWS stated that they would review the habitat evaluation spreadsheets during their review of the project documents.

Table 1. The team that participated in the Habitat Benefits Analysis for Lake Lou Yeager Section 206, Continuing Authorities Program, Aquatic Ecosystem Restoration Project.

Team Member	Specialty	Affiliation
Teri Allen, Ph.D.	Aquatic Ecologist	USACE
Ben McGuire	Wildlife and Wetland Biologist	USACE
John Vest	Hydraulic Engineer	USACE

Quantification is needed in the project planning process to evaluate benefits of project features because traditional benefit/cost evaluation is not applicable. To determine environmental restoration project benefits, models have been developed to quantify habitat benefits of project features for selected species.

We used both wildlife and fisheries based models to evaluate the effects of project feature on species at LLY. This was done because wildlife and aquatic habitats would be affected by the proposed feature. For non-forested wetland wildlife, we used the Slider Turtle (Morreale and Gibbons 1986) and Mink (Allen 1986) Habitat Suitability Index Models, developed by the U.S. Fish and Wildlife Service. For aquatic habitat, we used the White Crappie (Edwards et al. 1982) and the Bluegill (Stuber et al. 1982) Habitat Suitability Index Models, developed by the U.S. Fish and Wildlife Service. HSI models are widely accepted by local agencies, and have become the primary habitat evaluation method used in the St. Louis District Army Corps of Engineers.

Each of the HSI planning models used are presently approved for regional or nationwide use in accordance with documented geographic range, best practices and its designed limitations (see PCX and/or model review history for details). The PCX is comfortable with application of the planning models and/or the models have been reviewed and issues concerning the models and their documentation have been resolved to the satisfaction of the PCX.

Consistent with guidance from the USACE Ecosystem Planning Center of Expertise, the Agency Technical Review Team for the LLY Project will conduct an assessment of the models used for the project. This process will not result in certification, but will evaluate the technical quality and appropriateness of the models utilized.

2. Habitat Evaluation Methodology

The HSIs are numerical models that evaluate the quality and quantity of particular habitat for species selected by team members (Table 1). The qualitative component of the analysis is known as the habitat suitability index (HSI) and is rated on a 0.0 to 1.0 scale, with higher values indicating better habitat for that species. The HSI for a particular habitat type is determined by selecting values that reflect present and future project area conditions from a series of abiotic and biotic metrics. Each value corresponds to a suitability index for each species. Future values are determined using management plans, historical conditions, and best professional judgment. The quantitative component is the number of acres of the habitat being evaluated. From the calculated qualitative and quantitative values, the standard unit of measure, the habitat unit (HU) is calculated using the formula (HSI × Acres = HUs). Habitat units are calculated for specific target years to forecast changes in habitat values over the life of the project with- and without-project conditions. When HSI scores are not available for each year of analysis, a formula that requires only target year HSI and area estimates is used (USFWS 1980). This formula is:

$$\int_0^T HU\ dt \equiv (T_2 - T_1)\left[\left(\frac{A_1H_1 + A_2H_2}{3}\right) + \left(\frac{A_2H_1 + A_1H_2}{6}\right)\right]$$

Where:

$$\int_0^T HU\ dt = CumulativeHUs$$

T_1= first target year of time interval

T_2 = last target year of time interval

A_1 = area of available habitat at beginning of time interval

A_2 = area of available habitat at end of time interval

H_1 = habitat suitability index at the beginning of time interval

H_2 = habitat suitability index at end of the time interval

3 and 6 = constants derived from integration of HSI × Area for the interval between any two target years

This formula was developed to precisely calculate cumulative HUs when either HSI or area or both change over a time interval, which is common when dealing with the unevenness found in nature. Habitat Unit gains or losses are annualized by summing the cumulative HUs calculated using the above equation across all target years in the period of analysis and dividing the total (cumulative HU) by the number of years in the life of the project (i.e., 50 years). This calculation results in the Average Annual Habitat Units (AAHUs) (USFWS 1980).

The benefits of each proposed project feature (net AAHUs) are then determined by subtracting with-project benefits from without-project benefits. The effects of various habitat improvement feature combinations (alternatives) can then be evaluated by comparing the net AAHUs and costs for each alternative considered.

In preparation of using the HSI models, the evaluation team conducted several site visits and collected physiochemical data. They also reviewed historical and recent aerial photography, topographic maps, and preliminary hydrological modeling data. During the field evaluations and team meetings,

assumptions were developed regarding existing conditions and projected with-project conditions relative to habitat changes over time and management practices.

For the purpose of planning, design, and impact analysis, period of analysis was established as 50 years. To facilitate comparison, target years were established at 0 (existing conditions), 5, 25, and 50 years. HSIs and cumulative HUs for each evaluation species were calculated at each of these target years.

This appendix contains HSI summary tables and other data derived from the 8 spreadsheet files not included in this appendix. These spreadsheets are available upon request. [redacted]

3. Habitat Evaluation Species Selection

To begin the habitat evaluation process, the team reviewed the available HSI species models. They selected two fish species and 2 wildlife species (Table 2). Species were selected because they utilize the current or are anticipated to use the future habitat at LLY, and they represented different guilds from different taxonomic families.

Table 2. Aquatic and wildlife evaluation species selected for analysis.

Species	Scientific Name	Family	Primary Habitat Type	Food (Adults)
WETLAND (UPPER LLY)				
Slider Turtle	*Pseudemys scripta*	Emydidae	Aquatic sites with dense surface vegetation	Omnivorous
Mink	*Mustela vison*	Mustelidae	Forested areas near rivers, streams, or lakes	Carnivorous
AQUATIC (LOWER LLY)				
White Crappie	*Pomoxis annularis*	Centrarchidae	Lentic – Open water near submerged cover	Small fish
Bluegill	*Lepomis macrochirus*	Centrarchidae	Lentic - Shoreline	Zooplankton and insects

HSI indicator species included slider turtle and mink for the wetland area of LLY which would be above the proposed berm.

The slider turtle is a semiaquatic, omnivorous reptile that utilizes primarily aquatic areas with dense surface vegetation. Mating occurs in the water, but some suitable terrestrial area is required for egg-laying by nesting females. The mink is a semiaquatic, carnivorous mammal that is most commonly associated with brushy or wooded cover adjacent to aquatic habitats. Mink are most common along streams where there is an abundance of downfall or debris for cover and pools for foraging. Shallow water depth and low flow rates contribute to effective aquatic foraging by mink (Dunstone 1983).

Unlike slider turtles, mink utilize wooded cover adjacent to aquatic habitat for concealment, shelter, and litter rearing. Except for nesting female sliders, movement from an aquatic habitat is not necessary for maintaining a population, since many sliders remain in their natal habitats for years (Gibbons and Semlitsch 1982).

HSI indicator species included White Crappie and Bluegill for the open water area of LLY which would be below the proposed berm. White Crappie are in the family Centrarchidae. They are a predatory warm water sport fish that are most abundant in lakes and reservoirs greater than 5 acres (Trautman 1957; Buck and Thoits 1970). White crappie congregate in loose aggregations around submerged trees, stumps, brush, aquatic vegetation, and boulders (Trautman 1957; Hansen 1965; Pflieger 1997). Crappie over 150 mm feed almost exclusively on small fish (Crawley 1954; Marcy 1954; Burris 1956; Hoopes 1960; Neal 1962), with both adults and juveniles foraging over open water (Grinstead 1979).

Bluegill are also in the family Centrarchidae, but are most abundant along shoreline areas in lentic and lentic-type environments including ponds, lakes, reservoirs, and large low velocity streams (Whitmore et al. 1960). Bluegills are opportunistic feeders. Juveniles and adults feed on zooplankton, aquatic and terrestrial insects, and some plant materials (Scidmore and Woods 1960; Emig 1966; Scott and Crossman 1973).

4. Site Specific Methodology and Assumptions

During the second step of the evaluation process, the team determined what habitats would be affected by the project features and locations in the project area to evaluate these changes. The following HSI spreadsheets were used: Site 1 wetlands, Site 1 open water, Site 1a wetlands, and Site 1a open water. There were a total of 4 evaluation locations; one in the center of each of the proposed lake subunits for each site.

Table 3. Habitat benefit analyses worksheets used for each evaluation site

Habitat	Upper Lake	Lower Lake
Non-forested Wetland	X	
Open Water		X

Final calculations included determining the acreage of non-forested wetland and aquatic habitats using topographical data, management plans, land coverage data files, and aerial photography. Habitat suitability index scores (HSIs) were calculated for each species used in the HSI models. In evaluations that included multiple species, the HSIs were averaged then multiplied by the appropriate acreage to generate HUs and cumulative HUs (see above equation). The cumulative HUs were then annualized to yield AAHUs for with and without project.

General Assumptions and Habitat Characteristics

1. It was assumed that target years of 0 (existing condition), 5, 25, and 50 (future without and future with project conditions) are sufficient to analyze HUs and characterize habitat changes over the estimated period of analysis. The period of analysis was determined to be 50 years

based on the prediction that the accrual of benefits from maximum wetland development and sediment reduction were predicted to level off by 50 years.

2. The annual drawdown of the lake (usually between November and February) was taken into consideration by the team when completing the habitat evaluation.
3. The depths provided by the H&H Section were average depths and did not reflect a constant depth throughout the lake, either above or below the area of the proposed structure.
4. The team projected that without the project, sediment would continue to accumulate at the northern end of the lake, with escalating encroachment farther downstream. Additionally, the team projected that deeper areas of the lake would eventually be lost, thus reducing essential deepwater and overwintering habitat.
5. The team projected that with the project, the majority of the sediment would accumulate upstream of the berm, with reduced sedimentation occurring downstream in the lower lake (see H&H report for values).
6. For planning purposes, the team assumed that motorized aquatic craft would not be present above the proposed berm.
7. For planning purposes, the team assumed that no conversion of non-forest wetland to wetland forest would occur during the life of the project.
8. We assumed that operation of Lake Lou Yaeger would continue under the current management plans and objectives for at least the life of the project.
9. For planning purposes, the team assumed that sufficient overwintering and cover habitat, as well as areas of dissolved oxygen in excess of 5 ppm would be present in the lower lake both with and without the proposed berm for the 50 year evaluation period.
10. The study team determined that the existing seed bank in the study area should be able to allow for natural regeneration and therefore plantings would be unwarranted.
11. The team assumed that no maintenance dredging would occur upstream of the proposed berm during the life of the project.
12. The team projected that “channels” of open water would continue to exist in the each of the two upper tributaries leading into the lake (as is currently seen in the upper most portion of the Raymond Arm), with non-forest wetlands developing in the depositional areas outside of the “channel”.
13. The team assumed that the LLY Lake Manager would continue to implement their invasive species management program throughout the life of the project.

Feature Specific Assumptions

1. *Proposed Berm.* It was assumed that the placement of the proposed berm at Site 1 versus Site 1a would not affect habitat evaluation variables, with the exception of depth and water regime.
2. For planning purposes, the team agreed that the lower lake would lose acreage at the rate of 1% per year without the proposed berm and 0.5% per year with the proposed berm.

Non-forest Wetland Evaluation (Upper Lake) – USFWS partners strongly prefer the use of two or more indicator species per habitat type. Thus, we chose to evaluate the upstream impact of this feature using two dissimilar species, the slider turtle and the mink. It was assumed that inducing sedimentation deposition above the berm would result in the development of non-forest wetlands, similar to what currently occurs in shallow areas of the upper lake. No fisheries benefits are expected to be generated upstream of this feature, consequently no fish were used as indicator species for this portion of the lake.

Open water Evaluation (Lower Lake) – USFWS partners strongly prefer the use of two or more indicator species per habitat type. We chose to evaluate the downstream impact of this feature using two popular recreational fish species at LLY, white crappie and bluegill. The HSI models for these species were sensitive enough to respond to changes in sedimentation. White crappie were selected as an indicator species for piscivorous, open water fish; while bluegill were selected as an indicator species for omnivorous, shallow water species. No significant wetland benefits are expected to be generated downstream of this feature, consequently no non-forest wetland organisms were used as indicator species for this portion of the lake.

Wetland Acreage Determination

The wetland acreages used in the HSI evaluation were determined using National Agriculture Imagery Program (NAIP) imagery from 2015 in ArcGIS 10. Land cover types were digitized and areas of each were calculated using ArcGIS for the two different berm options. For future with and without project conditions, the difference between existing and future acres is due to the additional extent of the wetlands which would be expected to develop based on the rate of sedimentation and hydraulic conditions. Additionally, the evaluation team decided that the acreages of non-forested wetland growth would remain constant over time, until the expected end condition was reached. Table 4 lists the acreage of each of the wetland evaluation locations.

Table 4. Acreage of each the wetland evaluation location with and without project.

Wetland Acreage								
Wetland Acres	**Future Without Project**				**Future With Project**			
Target Year	**Year 0**	**Year 5**	**Year 25**	**Year 50**	**Year 0**	**Year 5**	**Year 25**	**Year 50**
Site 1	44	45	49	54	44	52	69	94
Site 1a	46	47	51	56	46	50	67	88

Open Water Acreage Determination

The open water acreage used in the HSI evaluation were calculated using H&H models for the two different berm sites at target year 0. For future with and without project conditions, the difference between existing and future acreage is due to the additional sediment deposition. In the model, the rate of sedimentation remains constant over time, until the expected end condition was reached at

target year 50. For planning purposes, acreage loss was calculated at a rate of 1% per year without the proposed berm and 0.5% per year with the proposed berm. Table 5 lists the acreage of the lower lake at each of the open water evaluation locations.

Table 5. Acreage of each the open water – lower lake evaluation location with and without project.

Open Water Acreage – Lower Lake								
Open Water Acres	Future Without Project				Future With Project			
Target Year	Year 0	Year 5	Year 25	Year 50	Year 0	Year 5	Year 25	Year 50
Site 1	1194	1135	929	722	1194	1164	1053	929
Site 1a	1206	1147	938	730	1206	1176	1064	939

5. Results

HSI Evaluation

Individual species HSI scores were averaged prior to calculating cumulative HUs. To see individual species HSI please refer to excel spreadsheets available upon request. Without, with, and net average annualized habitat units were calculated using this averaged HSI score for the non-forested wetland evaluation locations (Table 6) and the open water evaluation locations (Table 7).

The net averaged annualized AAHUs calculated using both the wetland and open water evaluations were summed together for each proposed berm site.

Table 6. Indicator species averaged HSI scores, without, with, and net average annualized habitat units determined using the slider turtle and mink HSI models for the non-forest wetland habitat.

Indicator Species Average HSIs	Target Year	Acres	HUs	Cumulative HU	AAHUs	Net AAHUs
Site 1 - Non-Forest Wetland Habitat						
0.53	0	44	23.3			
Without						
0.53	5	45	23.9			
0.59	25	49	29.0			
0.61	50	54	32.9	1419.19	28	0.00
				Total AAHUs	28	
With						
0.71	5	52	36.9			
0.87	25	69	59.8			
0.76	50	94	71.4	2728.04	55	26
				Total AAHUs	55	
Site 1a - Non-Forest Wetland Habitat						
0.53	0	46	24.4			
Without						
0.53	5	47	25.0			
0.59	25	51	30.1			
0.61	50	56	22.4	1334.34	27	0.00
				Total AAHUs	27	
With						
0.71	5	50	35.5			
0.87	25	57	58.1			
0.58	50	88	50.6	2434.05	49	22
				Total AAHUs	49	

Table 7. Indicator species averaged HSI scores, without, with, and net average annualized habitat units determined using the White Crappie and Bluegill HSI models for the open water habitat.

Indicator Species Average HSIs	Target Year	Acres	HUs	Cumulative HU	AAHUs	Net AAHUs
Site 1 - Open Water Habitat						
0.84	0	1194	1005			
Without						
0.84	5	1135	953			
0.83	25	929	773			
0.81	50	722	588	39148	783	0.00
				Total AAHUs	**783**	
With						
0.85	5	1164	989			
0.85	25	1053	895			
0.85	50	929	789	44790	893	**113**
				Total AAHUs	**896**	
Site 1a - Open Water Habitat						
0.84	0	1206	10798			
Without						
0.84	5	1147	10705			
0.83	25	938				
0.81	50	730		39549	791	0.00
				Total AAHUs	**791**	
With						
0.85	5	1176				
0.85	25	1064				
0.81	50	939		44818	896	**105**
				Total AAHUs	**896**	

The net annual impact reflects, in Average Annual Habitat Units (AAHU's), the difference between the future with- and future without- the aquatic ecosystem restoration conditions for Site 1 and Site 1a. For Site 1, approximately 139 more habitat units (HU's) would be available for indicator species every year during the life of the proposed project than would be available if the proposed project was not implemented. For Site 1a, this figure would be 127 more HUs (Table 8).

Table 8. Net annual impact (HUs) for non-forest wetland and open water indicator species based on evaluations for berm placement at sites 1 and 1a.

Habitat	AAHUs With Proposed Action	AAHUs Without Proposed Action	Net Annual Impact
Site 1			
Non-forested wetlands	55	28	26
Open Water – Lower Lake	783	896	113
Total	**838**	**924**	**139**
Site 1a			
Non-forested wetlands	49	27	22
Open Water – Lower Lake	791	896	105
Total	**840**	**923**	**127**

3. References

Allen, A.W. 1986. Habitat suitability index models: mink, revised. U.S. Fish Wildl. Serv. Biol. Rep. 82(10.127).

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APPENDIX D - REAL ESTATE

Real Estate Plan For
Feasibility Study For
Lake Lou Yaeger Section 206 Aquatic Ecosystem Restoration Continuing Authorities Project
Feasibility Study

1. Purpose

This report is tentative in nature, focuses on the Tentatively Selected Plan (TSP), and is to be used for planning purposes only. There may be modifications to the plans that occur during Preconstruction, Engineering and Design (PED) phase, thus changing the final acquisition area(s) and/or administrative and land cost. This Real Estate Plan (REP) is intended to support the Feasibility Report for the Lake Lou Yaeger Continuing Authorities Project. The City of Litchfield, Illinois is the Non-Federal Sponsor (NFS) for the project. This REP identifies Lands, Easements, and Rights-of-Way (LER) necessary to complete the project. There are no previous REP's for this project.

Lake Lou Yaeger has a surface area of approximately 1,205 acres and originally had a depth ranging from approximately 5.6 feet at the northern edge to nearly 32 feet at the southern edge near the dam. However, over the years, sediment has entered the lake regularly from the northern tributaries, runoff from the surrounding watershed, and wind and ice-induced bank erosion. However, during the construction of Interstate 55 in the early 1970s a large amount of sediment entered the western side of the lake, which exacerbated the sedimentation problem. The sediment accumulation has led to loss of lake depth (northern section of the lake has been reduced to approximately 2 feet or less most of the year) which has reduced important deep water summer and winter fish habitat, and has allowed American Lotus to expand and form monotypic stands in the lake reducing plant species diversity. In addition, the added suspended sediment has decreased water quality by directly increasing turbidity and indirectly by decreased dissolved oxygen due to the shallow depth. The increased turbidity inhibits site-foraging fish while low dissolved oxygen makes conditions unfavorable for many native fish species. Furthermore, the wind and ice-induced bank erosion has degraded the eastern shoreline, resulting in 6-foot high vertical banks which provide minimal cover and foraging habitat for fish. All of these factors contribute to the sedimentation problem which has resulted in overall fisheries habitat degradation.

The current plan includes building a rock berm to slow sedimentation from entering the lake and constructing road suitable for the size and weight of construction equipment.

2. Lands, Easements, and Rights-of-Way (LER)

The recommended plan includes construction of a rock berm on NFS lands. The plan also includes acquiring permanent road easements to ensure access to the property and that the access is sufficient for construction vehicle traffic.

Total LER required for each project purpose and feature

Permanent Road Easements	1.5 acres

The road easements will be acquired in 6 tracts from an estimated 6 landowners. The estimated value is detailed in Exhibit B.

The following standard estate will be acquired:

ROAD EASEMENT

A perpetual, non-exclusive easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. _____, _____ and _____) for the location, construction, operation, maintenance, alteration replacement of (a) road(s) and appurtenances thereto; together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, or obstacles within the limits of the right-of-way; (reserving, however, to the owners, their heirs and assigns, the right to cross over or under the right-of-way as access to their adjoining land at the locations indicated in Schedule B); subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

3. Non Federal Sponsor-Owned LER

The Non Federal Sponsor, the City of Litchfield, Illinois, owns fee title of the footprint of the lake and most of the surrounding area. Additional LER will be required for this project to secure road easements in order to expand the access roads to accommodate construction equipment.

4. Non Standard Estates

No Non Standard estates are required for the project.

5. Existing Federal Projects

There is no federal project that lies within the LER required for this project.

6. Federally-Owned Lands

There are no federally owned lands included within the LER required for the project.

7. Navigation Servitude

Navigation Servitude does not apply to this project.

8. Mapping

The final Right-of-Way maps are being developed. The draft maps are attached, see Exhibit A.

9. Induced Flooding

There will be no induced flooding as part of this project.

10. Baseline Cost Estimate

Permanent Road Easement $104,000

See Exhibit B.

11. Relocation Assistance Benefits

No persons, farms, or businesses will be displaced as part of this project.

12. Mineral Activity

There are no known present or anticipated mineral activity or timber harvesting in the project area.

13. Non Federal Sponsor Assessment

The City of Litchfield, Illinois is the Non Federal Sponsor for this project. The Sponsor's Capability has been assessed, a copy of the assessment will be attached as Exhibit C.

14. Zoning

There will be no zoning ordinances enacted to facilitate acquisition of land for this project.

15. Schedule

A detailed schedule will be developed when final ROW is determined. Normally a period of one year is allowed for the sponsor to acquire ROW after receipt of the final ROW limits from Real Estate Division. This one year period does not include land which may have to be condemned.

16. Facility or Utility Relocations

No facility or utility relocations are anticipated as part of this project.

17. HTRW

It is not anticipated that any HTRW contamination will be encountered, however a Phase 1 Environmental Site Assessment is being conducted. Areas of known contamination will be avoided to the extent possible. If an area cannot be avoided, the Non Federal Sponsor will be responsible for clean-up. No lands will be acquired until environmental clearances are received.

18. Landowner Attitude

There is no known landowner opposition to this project.

19. Notification to the Non Federal Sponsor Regarding the Risks Associated with Land Acquisition before Execution of the Project Partnership Agreement (PPA)

The sponsor does not intend to acquire any real estate until final ROW drawings are provided and the Project Partnership Agreement (PPA) is signed.

20. Other Relevant Real Estate Issues

This site is the Non Federal Sponsor's preferred access route.

[redacted]

Chief, Planning and Acquisition Section
USACE, Regional Real Estate Division North

[redacted]

Realty Specialist

Exhibit A Maps
Exhibit B Cost Estimate Report
Exhibit C Sponsor Capability

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 1A Permanent ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.5 ACRES

RIGHT OF WAY TO FOLLOW EDGE OF CEMETARY LANE

MATCH LINE
SEE SHEET C-107

E 5TH RD

APPROXIMATE COUNTY PROPERTY LINE

CEMETARY LANE

C/E

ACCESS PLAN
SCALE 1" = 100'
0 100' 200'
N

US Army Corps of Engineers®

DRAFT

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI 63103

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
DATE:
SOLICITATION NO.:
CONTRACT NO.:
PLOT SCALE: 1" = 100'
PLOT DATE:
FILE NUMBER:
FILE NAME: L:\Y_C-106.dgn
SIZE: ANSI D

LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 1A ACCESS PLAN
SHEET 1 OF 2

PLATE
C-106

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 1A Permanent ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.5 ACRES
2. UTILITY LOCATIONS ARE APPROXIMATE

RIGHT OF WAY TO FOLLOW EDGE OF CEMETARY LANE

C/E
C/E

CEMETARY LANE

RIGHT OF WAY FOR TEMPORARY ACCESS WITHIN LAKE PROPERTY LIMITS

STAGING AREA ALONG EXISTING PATH, CLEARING NOT ALLOWED

MINIMAL TREE CLEARING REQUIRED FOR ROCK BERM AND REVETMENT CONSTRUCTION

0.1 ACRES OF TREE CLEARING REQUIRED FOR ROCK BERM AND REVETMENT CONSTRUCTION

OVERHEAD ELECTRIC (LOCATION APPROXIMATE)

UNDERGROUND ELECTRIC (LOCATION APPROXIMATE)

P L
P L
P L
P L
P L

APPROXIMATE LAKE PROPERTY LINE

MATCH LINE
SEE SHEET C-106

ACCESS PLAN

SCALE 1" = 100'

0 100' 200'

N

US Army Corps of Engineers®

DRAFT

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI 63103

DESIGNED BY:
DWN BY:
CKD BY:
SUBMITTED BY:
PLOT SCALE:
PLOT DATE:
DATE:
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
SIZE: ANSI D
FILE NAME: LLY_C-107.dgn

LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 1A ACCESS PLAN
SHEET 2 OF 2

PLATE
C-107

Exhibit B - Cost Estimate Report

Contents Intentionally Removed - Not Releasable to the Public

EXHIBIT C

ASSESSMENT OF NON-FEDERAL SPONSOR'S
REAL ESTATE CAPABILITY

I. Legal Authority:

a. Does the sponsor have legal authority to acquire and hold title to real property for project purposes? Yes

b. Does the sponsor have the power of eminent domain for this project? Yes

c. Does the sponsor have "quick-take" authority for this project? Yes

d. Are any of the lands/interests in land required for the project located outside the sponsor's political boundary? Yes

II. Human Resource Requirements:

a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of the Federal project including P.L. 91-646, as amended? No

b. If the answer to II.a. is "yes," has a reasonable plan been developed to provided such training?

c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project? Yes

d. Is the sponsor's projected in-house staffing level sufficient considering its other workload, if any, and the project schedule? Yes

e. Can the sponsor obtain contractor support, if required in a timely fashion? Yes

f. Will the sponsor likely request USACE assistance in acquiring real estate? Yes

III. Other Project Variables:

a. Will the sponsor's staff be located within reasonable proximity to the project site? Yes

b. Has the sponsor approved project/real estate schedule/milestones? No

IV. Overall Assessment:

a. Has the sponsor performed satisfactorily on other USACE projects? N/A

b. With regard to this project, the sponsor is anticipated to be fully capable. Yes

APPENDIX E - COSTS

Contents Intentionally Removed - Not Releasable to the Public

APPENDIX F

ENVIRONMENTAL DATA AND COORDINATION

HENRY EILERS SHOAL CREEK CONSERVATION AREA,
VASCULAR PLANT LIST

Acalypha deamii (Weath.) Ahles
Acalypha gracilescens A. Gray
Acalypha virginica L.
Acer negundo L.
Acer saccharum Marshall
Achillea millefolium L.
Acorus calamus L.
Adiantum pedatum L.
Aesculus glabra Willd.
Agalinis auriculata
Agalinis purpurea (L.) Pennell*
Agalinis tenuifolia (Vahl.) Raf.
Agastache nepetoides (L.) Kuntze
Agrimonia parviflora Aiton
Agrimonia pubescens Wallr.
Agrimonia rostellata Wallr.
Agropyron repens (L.) P. Beauv.
Agrostis hyemalis (Walter) BSP
Agrostis perennans (Walter) Tuck.
Ailanthus altissima (Mill.) Swingle
Alisma subcordatum Raf.
Allium canadense L.
Allium sativum L.*
Allium vineale L.
Alopecurus carolinianus Walter
Amaranthus rudis Sauer.*
Ambrosia artemisiifolia L. var. elatior (L.) Descourt
Ambrosia bidentata Michx.
Ambrosia trifida L.
Amelanchier arborea (Michx.f.) Fern.*
Ammannia robusta Heer & Regal
Amorpha canescens Pursh
Amorpha fruticosa L.
Amphicarpa bracteata L. Fern.
Andropogon gerardii Vitman
Andropogon virginicus L.
Anemone virginiana L.*
Anemonella thalictroides (L.) Spach
Antennaria plantaginifolia (L.) Richardson
Apios americana Medik.
Aplectrum hyemale (Willd.) Nutt.
Apocynum androsaemifolia L.*
Apocynum cannabinum L.
Aquilegia canadensis L.
Arabis canadensis L.
Arabis perstellata E.L. Braun var. shortii Fern*
Arisaema dracontium (L.) Schott
Arisaema triphyllum (L.) Schott
Aristida oligantha Michx.
Aristolochia serpentaria L.
Aruncus dioicus (Walt.er) Fern
Asarum canadense L.*
Asclepias hirtella (Pennell) Woodson
Asclepias incarnata L.
Asclepias purpurascens L.
Asclepias quadrifolia Jacq.*
Asclepias syriaca L.
Asclepias verticillata L.
Asclepias viridiflora Raf.
Asimina triloba (L.) Dunal*
Asparagus officinalis L.
Asplenium platyneuron (L.) Oakes
Aster anomalus Engelm. Ex Torr. & Gray
Aster cordifolius var. sagittifolius
(Wedem. Ex Willd) A.G. Jones*
Aster drummondii Lindl.*
Aster ericoides L. var. prostratus (Ktze) Blake
Aster lanceolatus Willd.
var. simplex (Willd.) A.G. Jones
Aster lateriflorus (L.) Britton
Aster novae-angliae L.
Aster oblongifolius Nutt.*
Aster ontarionis Wiegand
Aster patens Aiton
Aster pilosus Willd.
Aster praealtus Poir.
Aster turbinellus Lindl.
Aster urophyllus Lindl.*
Athyrium filix-femina (L.) Roth
var. asplenioides (Michx.) Farw.*
Aureolaria grandiflora (Benth.) Pennell
var. pulchra Pennell
Baptisia leucantha T.&G.
Baptisia leucophaea Nutt.
Barbarea vulgaris R. Br. Var. arcuata (Opiz) Fries.
Betula nigra L.
Bidens aristosa (Michx.) Britton
Bidens cernua L.
Bidens frondosa L.
Bidens tripartita L.
Blephilia ciliata (L.) Sw.
Botrychium dissectum Spreng. Var. dissectum*
Botrychium dissectum spreng. Var. dissectum*
var. obliquum (Muhl.) Clute
Botrychium virginianum (L.) Sw.

Aristida longispica Poir.
Brachyeletrum erectum (Schreb.) P.Beauv.
Bromus inermis Leyss
Bromus latiglumis (Shear) Hitchc.*
Bromus pubescens Willd.
Bromus tectorum L.
Cacalia atriplicifolia L.
Calamagrostis canadensis (Michx.) P.Beauv.*
Callitriche terrestris Raf.
Calystegia sepium
ssp. Americana (Sims) Brummitt.
Calystegia sepium (L.) ssp. Repens (L.) Brummitt
Calystegia spithamaea (L.) Pursh
Camassia scilloides (Raf.) Cory
Campanula americana L.
Campsis radicans (L.) Seem.
Capsella bursa-pastoris (L.) Medik.
Cardamine pensylvanica Willd.
Carduus nutans L.
Carex aggregata Mack.*
Carex albicans Willd. Var. albicans
Carex blanda Dewey
Carex brevior (Dewey) Lunell
Carex bushii Mack.
Carex cephalaphora Willd.
Carex conjuncta Boott
Carex cristatella Britton
Carex davisii Schwein. & Torr.
Carex festucacea Willd.
Carex frankii Kunth
Carex gracilescens Steud.*
Carex granularis Willd.
Carex gravida L H. Bailey
Carex grisea Wallenb.
Carex hirsutella Mack.
Carex hirtifolia Mack.
Carex jamesii Schwein.
Carex lacustris Willd.*
Carex leavenworthii
Carex meadii Dewey
Carex mesochorea Mack.*
Carex molesta Bright
Carex muhlenbergii Willd.
Carex nigromarginata Schwein.*
Carex normalis Mack.
Carex oligocarpa Willd.
Carex pensylvaniaca Lam.
Carex radiata (Kwahlenb.) Small.
Carex stricta Lam.
Carex swanii (Fern.) Mack.
Carex tenera Dewey
Carex tetanica Schkuhr*
Carex tribuloides Wahlenb.
Carex umbellata Willd.
Carex vulpinoidea Michx.
Carya cordiformis (Wangenh.) K. Koch
Carya ovata (Mill.) K. Koch
Carya tomentosa (Poir) Nutt.
Cassia fasciculata Michx.
Cassia marilandica L.
Ceanothus americanus L.
Celastrus scandens L.
Celtis occidentalis L.
Centunculus minimus L.*
Cephalanthus occidentalis L.
Cerastium vulgatum L.
Cercis canadensis L.
Chaerophyllum procumbens (L.) Crantz.
Chasmantium latifolium (Michx.) H.O. Yates
Chenopodium album L..
Chenopodium standleyanum Aellen
Cichorium intybus L.
Cinna arundinacea L.
Circaea lutetiana L. var. canadensis L.
Cirsium altissimum (L.) Spreng.
Cirsium discolor (Muhl.) Spreng.
Claytonia virginica L.
Clematis virginiana L.*
Comandra umbellata (L.) Nutt.
Commelina communis L.
Corallorhiza odontorhiza Willd.
Corallorhiza wisteriana Conrad.
Cuphea viscosissima Jacq.
Cuscuta coryli Engelm.*
Cuscuta cuspidata Engelm.*
Cuscuta pentagona Engelm.*
Cynanchum laeve (Michx.) Pers.
Cyperus acuminatus Torr. & Hook.
Cyperus aristatus Rottb.*
Cyperus erythrorhizos Muhl.*
Cyperus ferruginescens Boeckl.*
Cyperus ovularis (Michx.) Torr.
Cyperus rivularis Kunth
Cyperus strigosus L.
Cypripedium calceolus L.
var. pubescens (Willd.) Correll*
Cystopteris fragilis (L.) Bernh. Var. protrusa Weath.
Dactylis glomerata L.

Carex retroflexa
Carex shortiana Dewey
Carex squarrosa L.
Dasistoma macrophylla (Nutt.) Raf.
Daucus carota L.
Delphinium tricorne Michx.
Dentaria laciniata Muhl.
Desmodium canescens (L.) DC.*
Desmodium ciliare (Willd.) DC.
Desmodium cuspidatum (Willd.) Loudon
var. longifolium (T&G) Schub.*
Desmodium glabellum (Michx.) A.W. Wood
Desmodium marilandicum (L.) DC.
Desmodium nudiflorum (L.) DC.
Desmodium paniculatum (L.) DC.
Desmodium sessilifolium (Torr.) T & G
Dianthus armeria L.
Diarrhena americana P. Beauv.
var. obovata Gleason
Dicentra cucullaria (L.) Bernh.
Digitaria ischaemum (Schreb.) Muhl.
Digitaria sanguinalis (L.) Scop.
Diodia teres Walter
Dioscorea villosa L.
Diospyros virginiana L.
Dodecatheon meadia L.
Draba verna L.
Dryopteris carthusiana (Villars) H.P. Fuchs*
Echinacea pallida Nutt.
Echinacea pupurea (L.) Moench
Echinochloa crusgalli (L.) P.Beauve.*
Echinochloa crusgalli (L.) P.Beauve.*
var. frumentacea (Roxb.) W. Wight*
Eclipta prostrata (L.) L.
Eleagnus umbellata Thunb.*
Eleocharis engelmannii Steud.
Eleocharis obtusa (Willd.) Schult.*
Eleocharis smallii Britton*
Eleocharis tenuis (Willd.) Shcult.
var. verrucosa (Svenson) Svenson
Eleusine indica (L.) Gaertn.
Ellisia nyctelea L.
Elymus hystrix L.
Elymus villosus Willd.
Elymus virginicus L.
Epilobium coloratum Biehler
Equisetum arvense L.
Equisetum hyemale L. var. affine
(Engelm.) A. A. Eaton
Eragrostis capillaris (L.) Nees.*
Eragrostis cilianensis (All.) Mosher
Danthonia spicata (L.) P. Beauv.
Eragrostis hypnoides (Lam.) BSP.
Eragrostis pectinacea (Michx.) Nees.
Eragrostis spectabilis (Pursh) Steud.
Erechtites hieracifolia (L.) Pers.
Erigeron Philadelphicus L.
Erigeron pulchellus Michx.*
Erigeron strigosus Willd.
Erigenia bulbosa (Michx.) Nutt.*
Erythronium albidum Nutt.
Euonymus atropurpureus Jacq.
Euonymus fortunei (Turez.) Hand.-Mazz.*
Eupatorium altissimum L.
Eupatorium coelestinum L.
Eupatorium purpureum L.
Eupatorium rugosum Houtt.
Eupatorium serotinum Michx.
Eupatorium sessilifolium L.
Euphorbia corollata L.
Euphorbia dentata Michx.
Euphorbia maculata L.
Euphorbia supina Raf.
Euthamia graminifolia (L.) Nutt.
var. nuttallii (Greene) W. Stone
Festuca obtusa Biehler
Festuca pratensis Huds.
Floerkea proserpinacoides Willd.*
Fragaria virginiana Duchesne
Frasera caroliniensis Walter
Fraxinus americana L.
Fraxinus pennsylvanica Marshall
var. subintegerrima (Vahl) Fern.
Galium aparine L.
Galium circaezans Michx.
Galium circaezans Michx. Var. hypomalacum Fern.
Galium concinnum T. & G.
Galium triflorum Michx.
Gentiana flavida A. Gray
Geranium carolinianum L.
Geranium maculatum L.
Geum canadense Jacq.
Geum vernum (Raf.) T. & G.
Glechoma hederacea L.
Gleditsia triacanthos L.
Glyceria striata (Lam.) Hitchc.
Gnaphalium purpureum L.*
Gratiola neglecta Torr.
Habenaria lacera (Michx.) Lodd.
Hackelia virginiana (L.) I.M. Johnston
Kuhnia eupatorioides L. var. corymbulosa T. & G.

Hedeoma pulegioides (L.) Pers.
Hedyotis crassifolia (gairtner) Hook.
Hedyotis purpurea (L.) T. & G.*
Helianthemum bicknellii Fern.*
Helianthus divaricatus L.
Helianthus mollis Lam.
Helianthus strumosus L.*
Helianthus tuberosus L. var. subcanescens A. Gray
Heliopsis helianthoides (L.) Sweet
Hemicarpha micrantha (Vahl) Britton*
Heuchera richardsonii R. Br.
var. grayana Rosend., Butters & Lakela
Hibiscus palustris L.
Hibiscus trionum L.
Hieracium gronovii L.
Hieracum longipilum Torr.
Hieracium scabrum Michx.
Holosteum umbellatum L.
Hordeum pusillum Nutt.
Humulus lupulus L.
Hydrangea arborescens L.*
Hydrophyllum canadense. L.*
Hydrophyllum virginianum L.
Hypericum drummondii (Grev. & Hook.) T. & G.
Hypericum mutilum L.
Hypericum prolificum Lam.
Hypericum sphaerocarpum Michx.
Hypoxis hirsuta (L.) Coville*
Impatiens capensis Meerb.
Impatiens pallida Nutt.
Iodanthus pinnatifidus (Michx.) Steud.
Ipomoea hederacea (L.) Jacq.
Ipomoea pandurata (L.) G. Mey
Iris brevicaulis Raf.*
Iris germanica L.*
Iris shrevei Small
Isopyrum biternatum (Raf.) T. & G.
Juglans cinerea L.
Juglans nigra L.
Juncus biflorus Elliott*
Juncus brachycarpus Engelm.
Juncus interior Wiegand
Juncus secundus P. Beauv.*
Juncus tenuis Willd.
Juncus torreyi Coville
Juniperus virginiana L. var crebra Fern. & Griscom
Koeleria macrantha (Ledeb.) Schult.
Krigia biflora (Walter) S.F. Blake*
Medicago lupulina L.
Medicago sativa L.
Lactuca canadensis L.
Lactuca floridana (L.) Gairtn.
Lactuca serriola L.
Lamium amplexicaule L.
Lamium purureum L.
Laportea canadensis (L.) Wedd.
Lechea tenuifolia Michx.
Leersia oryzoides (L.) Swartz
Leersia virginica Willd.
Lemna minuscula Hertel
Leonurus cardiaca L.
Lepidium campestre (L.) R.Br.
Lepidium virginicum L.
Lespedeza capitata Michx.
Lespedeza cuneata (Dumort.) G. Don.
Lespedeza intermedia (S. Watson) Britton*
Lespedeza procumbens Michx.*
Lespedeza stipulacea Maxim.
Lespedeza striata (Thunb.) Hook. & Arn.
Lespedeza violacea (L.) Pers.
Lespedeza virginica (L.) Britton
Leucospora multifida (Michx.) Nutt.
Liatris aspera
Liatris cylindracea Michx.
Liatris pycnostachia
Liatris scariosa (L.) Willd.
var.nieuwlandii Lunell*
Lilium michiganense Farw.*
Lindera benzoin (L.) Blume*
Lindernia dubia (L.) Pennell
Linum medium (Planch.) Britton.
var. texanum (Planch.) Fern.
Liparis lilifolia (L.) Lindl.
Lithospermum canescens (Michx.) Lehm
Lobelia inflata L.
Lobelia siphilitica L.
Lonicera japonica Thunb.
Lonicera maackii (Rupr.) Maxim.
Lonicera morrowii A. Gray*
var. glabrescens (Kuntze) Shinners
Lycopus americanus Muhl.
Lycopus uniflorus Michx.*
Lycopus virginicus L.
Lysimachia ciliata L.*
Lysimachia lanceolata Walter
Lysimachia nummularia L.*
Maclura pomifera (Raf.) C.K. Scheid.
Malus ioensis (A.W. Wood) Britton
Malus pumila Mill.*
Paronychia fastigiata (Raf.) Fern.

Melilotus alba Medik.
Melilotus officinalis (L.) Pall.
Menispermum canadense L.
Mentha x piperita L.*
Mertensia virginica (L.) Pers.
Mimulus ringens L.
Mirabilis nyctaginea (Michx.) MacMill.
Mollugo verticillata L.
Monarda bradburiana Beck
Monarda clinopodia L.
Monarda fistulosa L.
Monotropa hypopithys L.
Monotropa uniflora L.*
Morus rubra L.
Muhlenbergia frondosa (Poir.) Fern.
f. commutata (Scribn.) Fern.
Muhlenbergia frondosa (Poir.) Fern. F. frondosa
Muhlenbergia glabriflora Scribn.
Muhlenbergia sobolifera (Muhl.) Trin.
Muhlenbergia sylvatica Torr.
Myosotis verna Nutt.
Myosurus minimus L.
Oenothera biennis L.
Onoclea sensibilis L.*
Ophioglossum vulgatum L.
var. pseudopodum (S.F. Blake) Farw.*
Orchis spectabilis L.*
Ornithogalum umbellatum L.
Orobanche uniflora L.*
Osmorhiza longistylis (Torr.) D.C.
Ostrya virginiana (Mill.) K. Koch
Oxalis dillenii Jacq.
Oxalis stricta L.
Oxalis violacea L.
Panicum boscii (Poir.) *
Panicum capillare L.
Panicum clandestinum L.
Panicum depauperatum Muhl.
Panicum dichotomiflorum Michx.
Panicum gattingeri Nash*
Panicum implicatum Britton
Panicum latifolium L.
Panicum linearifolium Scribn.*
Panicum virgatum L.
Parietaria pensylvanica Willd.
Paronychia canadensis (L.) A.W. Wood
Paspalum ciliatifolium Michx.
Paspalum laeve Michx.

Polystichum acrostichoides (Michx.) Schott
Populus deltoides Marshall
Parthenocissus quinquefolia (L.) Planch.
Paspalum ciliatifolium Michx.
var. muhlenbergii (Nash) Fern.
Passiflora lutea L. var glabriflora Fern.
Pastinaca sativa L.
Penstemon digitalis Nutt.
Penstemon pallidus Small
Penthorum sedoides L.
Petalostemum candidum (Willd.) Michx.
Petalostemum purpureum (Vent.) Rydb.
Phalaris arundinacea L.
Phleum pratense L.
Phlox divaricata L.ssp. Laphamii A. W. Wood
Phlox paniculata L.
Phlox pilosa L
Phryma leptostachya L.
Phyla lanceolata (Michx.) Greene
Phyllanthus caroliniensis Walter
Physalis heterophylla Nees
Physalis virginiana Mill.
Phytolacca americana L.
Pilea pumila (L.)A. Gray
Plantago aristata Michx.
Plantago lanceolata L.
Plantago rugelii Decne.
Plantago virginica L.
Plantago occidentalis L.
Poa chapmaniana Scribn.
Poa compressa L.
Poa pratensis L.
Poa sylvestris A. Gray
Podophyllum peltatum L.
Polemonium reptans L.
Polygala sanguinea L.
Polygala verticillata L.*
Polygala verticillata L. var. isocycla*
Polygonatum commutatum (Schult.f.) A. Dietr.
Polygonum buxiforme Small*
Polygonum caespitosum Blume
var. longisetum (Bruyn) Stewart
Polygonum hydropiper L.*
Polygonum hydropiperoides Michx.
Polygonum lapathifolium L.
Polygonum pensylvanicum L.
Polygonum persicaria L.
Polygonum punctatum Elliott

Polygonum scandens L.
Polygonum virginianum L.
Rubus flagellaris Willd.
Rubus occidentalis L.

Porteranthus stipulatus (Muhl) Britton
Potamogeton foliosus Raf.
Potamogeton nodosus Poir.
Potentilla recta L.
Potentilla simplex Michx.
Prenanthes crepidinea Michx.*
Prenanthes racemosa Michx.*
Prunella vulgaris L. var. lanceolata (Barton) Fern.
Prunus americana Marshall*
Prunus hortulana L. H. Bailey*
Prunus mexicana S. Wats.*
Prunus serotina Ehrh.
Psoralia onobrychis Nutt.
Ptelea trifoliata L.*
Pycnanthemum pilosum Nutt.
Pycnanthemum tenuifolium Schrad.
Quercus alba L.
Quercus bicolor Willd.
Quercus imbricaria Michx.
Quercus macrocarpa Michx.
Quercus Marilandica Munchh.
Quercus muhlenbergii Englem.
Quercus palustris Munchh.
Quercus rubra L.
Quercus stellata Wangenh.
Quercus velutina Lam.
Ranunculus abortivus L.*
Ranunculus fascicularis Bigelow
Ranunculus harveyi (A. Gray) Britton*
Ranunculus hispidus Michx.*
Ranunculus micranthus Nutt.

Ranunculus sardous Crantz.*
Ranunculus sceleratus L.
Ranunculus septentrionalis Poir.
Ratibida pinnata (Vent.) Barnhart
Rhus copallina L. var Latifolia Engl.
Rhus glabra L.
Ribes missouriense Nutt.
Robinia pseudoacacia L.
Rorippa palustris (L.) Besser
var. fernaldiana (Butters & Abbe) Stuckey
Rorippa sessiliflora (Nutt.) Hitchc.
Rosa carolina L.
Rosa multiflora Thunb.
Rosa setigera Michx.*
Rubus allegheniensis Porter*
Solanum americanum Mill.
Solanum carolinense L.
Solidago altissima L.
Solidago gigantea Aiton
Rubus pensilvanicus Poir.*
Rudbeckia hirta L.
Rudbeckia laciniata L.
Rudbeckia subtomentosa Pursh
Rudbeckia triloba L.
Ruellia humilis Nutt.
Ruellia strepens L.
Rumex crispus L.
Rumex mexicanus Meisn.
Rumex verticillatus L.
Sabatia angularis (L.) Pursh
Sagittaria brevirostra Mack. & Bush*
Salix exigua Nutt. Ssp. Interior (Rowlee) Cronq.
Salix humilis Marshall
Salix nigra Marshall
Salix rigida Muhl.*
Sambucus canadensis L.
Samolus floribundus HBK.
Sanguinaria canadensis L.
Sanicula gregaria E. P. Bicknell
Sassafras albidum (Nutt) Nees
Schizachyrium scoparium (Michx.) Nash
Scirpus atrovirens Willd.
Scirpus pendulus Muhl.
Scrophularia marilandica L.
Scutellaria incana Biehler
Scutellaria lateriflora L.
Scutellaria leonardii Epling.*
Scutellaria parvula Michx.
Senecio glabellus Poir.
Setaria faberi Herrm.
Setaria geniculata (Lam.) Beauv.
Setaria glauca (L.) P. Beauv.
Sida spinosa L.
Silene antirrhina L.
Silene nivea (Nutt.) Otth
Silene stellata (L.) W.T. Aiton

Silphium integrifolium Michx.
Silphium perfoliatum L.
Silphium terebinthinaceum Mill.
Sisyrinchium campestre E. P. Bicknell
Sisyrinchium
Smilacina racemosa (L.) Desf.
Smilacina stellata (L.) Desf.*
Smilax ecirrhata (Englem.) S. Watson
Smilax glauca Walter*
Smilax lasioneura Hook.
Smilax hispida Muhl.
Tridens flavus (L.) Hitchc.
Trifolium hybridum L.

Solidago missouriensis Nutt.
var. fasciculata Holtz.
Solidago nemoralis Aiton
Solidago radula Nutt.
Solidago rigida L.
Solidago speciosa Nutt.
Solidago ulmifolia Muhl.
Sonchus asper (L.) Hill
Sorghastrum nutans (L.) Nash
Sphenopholis intermedia Rydb.
Sphenopholis obtusata (Michx.) Scribn.
Spiraea prunifolia sieb. & Zucc.*
Spiranthes cernua (L>) Rich
Spiranthes lacera Raf.*
Spiranthes ovalis Lindl.
Spiranthes tuberosa Raf.
Spirodela polyrhiza (L.) Schleid.
Sporobolus asper (Michx.) Kunth
Sporobolus heterolepis A. Gray
Sporobolus vaginiflorus (Torr.) A.W. Wood
var. hispida (Pursh) Fern.
Staphylea trifolia L.
Stellaria media (L.) Vill.
Strophostyles helvula (L.) Elliott
Strophostyles leiosperma (T. & G.) Piper
Strophostyles biflora (L.) BSP
Symphoricarpos orbiculatus Moench
Taenidia integerrima (L.) Drude
Taraxacum officinalis Weber
Tephrosia virginiana (L.) Pers.
Teucrium canadense L.
Thalictrum dasycarpum Fisch. & Ave'-Lall
Thalictrum dioicum L.*
Thalictrum revolutum DC.
Thaspium barbinode (Michx.) Nutt.
Thaspium triangulatum (L.) A. Gray
Thlaspi arvense L.
Tilia americana L
Torilis arvensis (Huds.) Link

Toxicodendron radicans (L.) Kuntze
var. negundo (Greene) Reveal
Trifolium pratense L.
Trifolium reflexum L. var. glabrum Lojac.*
Trifolium repens L.
Triodanis perfoliata (L.) Nieuwl.
Triosteum aurantiacum E. P. Bicknell
var.illinoense (Wiegand) E. Palmer & Steyerm
Triosteum perfoliatum L.
Typha latifolia L.
Ulmus Americana L.
Ulmus rubra Muhl.
Uvularia grandiflora Sm.
Valerianella radiata (L.) Dufr.

Verbascum thapsus L.
Verbena hastata L.
Verbena urticifolia L.
Verbesina alternifolia (L.) Britton
Verbesina helianthoides Michx.
Vernonia gigantea (Walter) Trel.*
Vernonia missurica Raf.
Veronica arvensis L.
Veronica peregriina L.
Veronicastrum virginicum (L.) Farw.
Viburnum opulus L.
Viburnum prunifolium L.
Viola palmata L.
Viola pedata L.*
Viola pubescens Aiton
Viola rafinesquii Greene
Viola sororia Willd.
Viola striata Aiton
Vitis aestivalis Michx.
Vitis cinerea Engelm.
Vitis riparia Michx.
Vitis vulpina L.
Vulpia octoflora (Walter) Rydb.*
Woodsia obtusa (Spreng.) Torr.
Xanthium strumarium L.
Yucca filamentosa L.
Zanthoxylum americanum Mill.
Zizia aurea (L.) W.D.J. Koch

COORDINATION, PUBLIC VIEWS, AND RESPONSES

Notification of this Environmental Assessment and unsigned Finding of No Significant Impact were sent to the following officials, agencies, organizations, and individuals for review and comment. All associated letters, comments, and responses will be filed with the final document.

ELECTED OFFICIALS - FEDERAL	
Honorable Rodney Davis United States Representative 1740 Longworth House Office Building	Honorable Richard J. 'Dick' Durbin United States Senator 711 Hart Senate Office Building Washington, DC 20510
Honorable Mark Kirk United States Senator 524 Hart Senate Office Building Washington DC, 20510	
ELECTED OFFICIALS - STATE	
Senator Andy Manar 48th District 119A Capitol Building Springfield, IL 62706	Representative Avery Bourne 95th District 205A-N Stratton Office Building Springfield, IL 62706
GOVERNMENT OFFICES - FEDERAL	
Matt Mangan, Fish and Wildlife Biologist U.S. Fish and Wildlife Service, Region 3 Marion Illinois Sub-office (ES) 8588 Route 148 Marion, IL 62959	Annette S. Holmes USDA-Natural Resources Conservation Service Assistant State Conservationist - Area 2 2623 Sunrise Drive, Suite 3 Springfield, Illinois 62703
Aaron Engstrom, District Conservationist USDA-Natural Resources Conservation Service 1621 Vandalia Road, Suite D Hillsboro, IL 62049	Amanda Ratliff Public Assistance Branch Chief Federal Emergency Management Agency 536 South Clark St., 6th Floor Chicago, IL 60605
Ken Westlake USEPA REGION 5 77 West Jackson Boulevard Mail Code: E-19J Chicago, IL 60604-3507	
GOVERNMENT OFFICES - STATE	

Rachel Leibowitz Deputy State Historic Preservation Officer Preservation Services Division Illinois Historic Preservation Agency 1 Old State Capitol Plaza Springfield, Illinois 62701-1507	Karen Miller, Section Manager Impact Assessment Section Realty and Planning Division Illinois Department of Natural Resources One Natural Resources Way Springfield, IL 62702-1271
Alec Messina, Director Illinois Environmental Protection Agency 1021 North Grand Avenue East P.O. Box 19276 Springfield, Illinois 62794-9276	Ms. Diana Holmes Montgomery County Illinois Emergency Management Agency 120 North Main St.\Courthouse Hillsboro, IL 62049
Illinois Environmental Protection Agency Bureau of Water Watershed Management Section 1021 N. Grand Avenue East P.O. Box 19276 Springfield, Illinois 62794-9276	
ORGANIZATIONS	
Kathy Andria American Bottoms Conservancy P.O. Box 4242 Fairview Heights, IL 62208	Jack Darin, Chapter Director Sierra Club Illinois Chapter 70 E Lake Street Suite 1500 Chicago, IL 60601
The Nature Conservancy Illinois River Project Office 11304 N. Prairie Road Lewistown, Illinois 61542	Ronald Moore, President Izaak Walton League of America 55 Ridgecrest Drive Decatur, IL 62521
The Telegraph P.O. Box 278 111 E. Broadway Alton, IL 62002	Belleville News-Democrat P.O. Box 427 120 South Illinois Belleville, IL 62220
St. Louis Post-Dispatch Terry Hillig – Illinois Bureau 101 W. Vandalia – Suite 305J Edwardsville, IL 62025	

CEMVP-PD-C **09 FEBRUARY 2016**

MEMORANDUM FOR RECORD

SUBJECT: Environmental Compliance for the Lake Lou Yaeger Section 206 Ecosystem Restoration Project, City of Litchfield, Montgomery County, Illinois

On or about 8 February 2016, I spoke with Matt Mangan of the U.S. Fish and Wildlife Service about the Lake Lou Yaeger Section 206 CAP Project. We discussed the need for conducting the interagency Habitat Evaluation for the project, as well as how coordination under the Fish and Wildlife Coordination Act would be handled. Matt stated that the FWS would not be providing a planning aid letter (PAL) or a Draft Coordination Act Report (DCAR,) and declined participation in the habitat modeling effort, citing the small size of the project. Matt stated that the FWS would complete its Coordination Act review during the public review of the report.

[redacted]

Teri Allen, Ph.D.
Chief, Environmental Compliance Section

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF

August 3, 2016

Engineering and Construction Division
Curation and Archives Analysis Branch

Ms. Rachel Leibowitz
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62701-1507

Dear Ms. Leibowitz:

Pursuant to the National Historic Preservation Act, Section 106 (as amended), and its implementing regulation 36 CFR 800, the St. Louis District, U.S. Army Corps of Engineers, hereby notifies the Illinois State Historic Preservation Officer that the St. Louis District is proposing an aquatic ecosystem restoration project at Lake Lou Yeager, Montgomery County, Illinois.

Lake Lou Yaeger, owned by the City of Litchfield, was created by damming the West Fork of Shoal Creek creating an impoundment approximately 7.5 miles long. The lake was built in 1966 under the Watershed Protection and Flood Prevention Act (Puhlic Law 83-566, 1954, as amended) for water supply, flood control, and recreation. Since the lake's creation, it has seen a reduction in surface area and depth due to sedimentation and bank erosion. The aquatic ecosystem degradation at the lake has caused a loss of aquatic habitat.

This project seeks to restore wetland habitat, function, and process; restore shallow water fisheries habitat; and maintain deep water habitat. The present feasibility study examined numerous measures for their effectiveness in achieving the desired ecosystem restoration objective of the project. Two alternatives were carried forward for full evaluation, both of which are rock berms placed below the water surface across the lake at relatively narrow locations (see attachment). Construction of either alternative will take place entirely within the lake itself in an areas previously surveyed for historic properties prior to the impoundment of the lake. No historic properties have been identified within the foot-print of the berms, therefore no adverse effect is anticipated. However, Alternative 1, the tentatively selected plan, would require the construction of a temporary haul road across private land. Impacts to potentially significant historic properties are not anticipated during this activity, however once a right–of–entry is acquired from the private land owner, an archaeological survey of this proposed project element will be conducted. In the event any historic properties are located, they will be evaluated for National Register eligibility, in consultation with the Illinois Historic Preservation Officer, and the temporary road will be rerouted to avoid damaging any historic properties.

Given this information, the St. Louis District is requesting your review and initiating consultation with your office regarding this project. If you have any questions regarding this matter, please contact Ms. Lara Anderson directly at (314) 331-8779, or e-mail Lara.anderson@usace.army.mil .

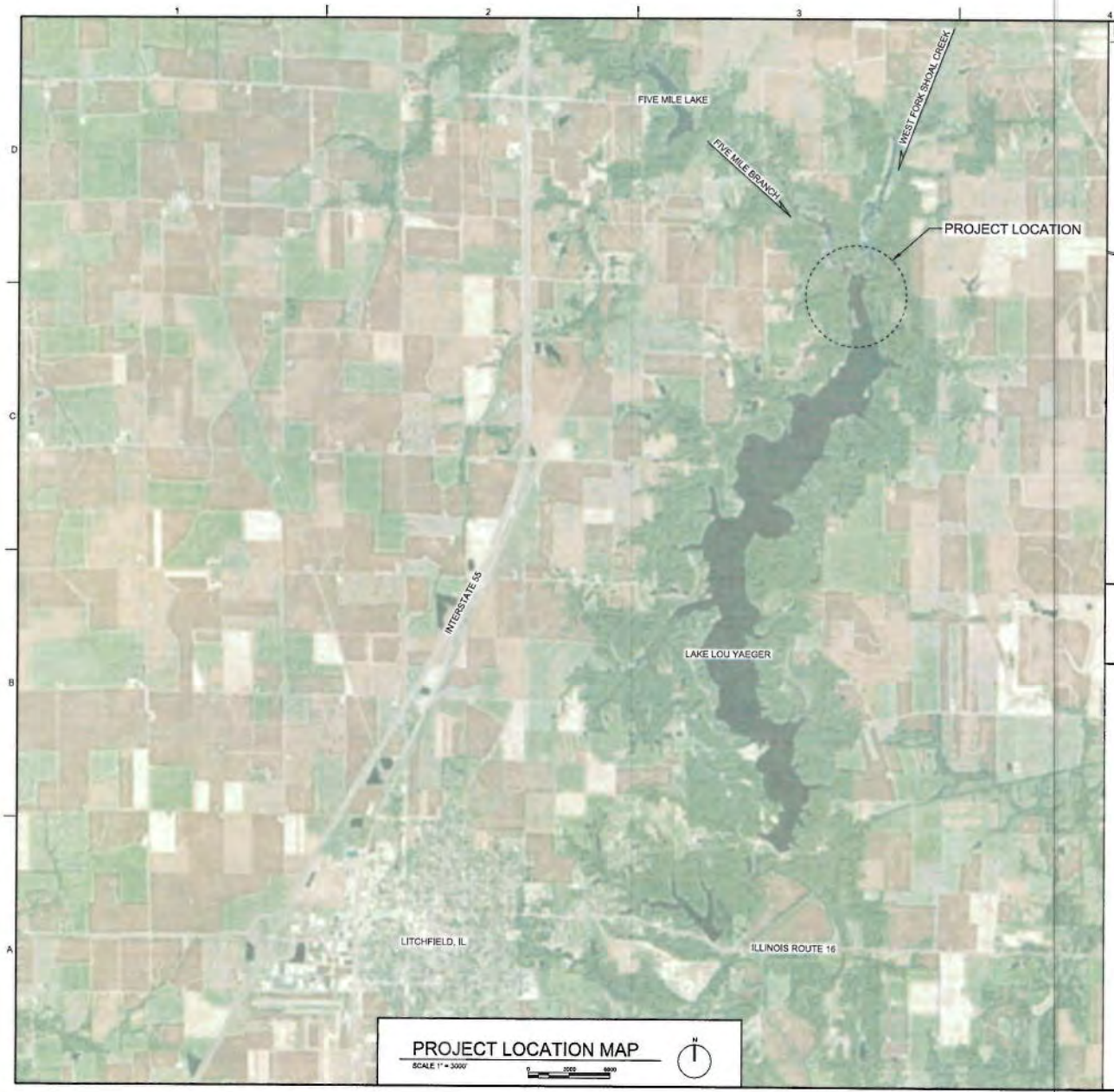
Thank you, in advance, for your timely review of the request.

Sincerely,

[redacted]

Michael K. Trimble, Ph.D.
Chief, Curation and Archives
Analysis Branch

Attachments



PROJECT LOCATION MAP

SCALE 1" = 3000'

VICINITY MAP

SCALE: NTS

US Army Corps of Engineers

DRAFT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: | DATE:
DRAWN BY: | CHECKED BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1:1 | PLOT DATE: AS NOTED | FILE NUMBER:
FILE NAME: G:\...\G002_VIC.dgn

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI 63103

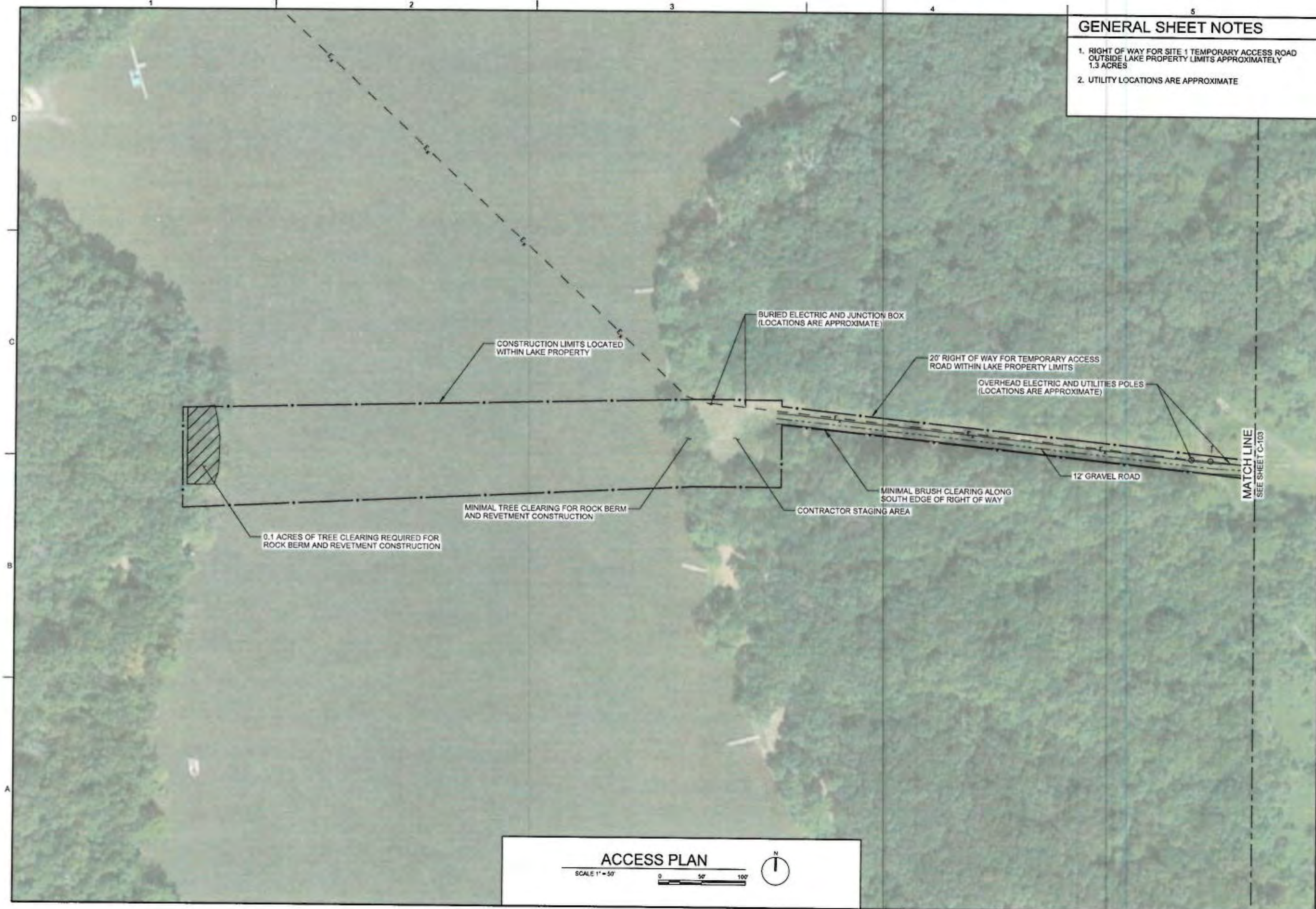
LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

PROJECT LOCATION AND VICINITY MAP

PLATE
G-002

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 1 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.3 ACRES
2. UTILITY LOCATIONS ARE APPROXIMATE



ACCESS PLAN

SCALE 1" = 50'

0 50' 100'

N

US Army Corps of Engineers

DRAFT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

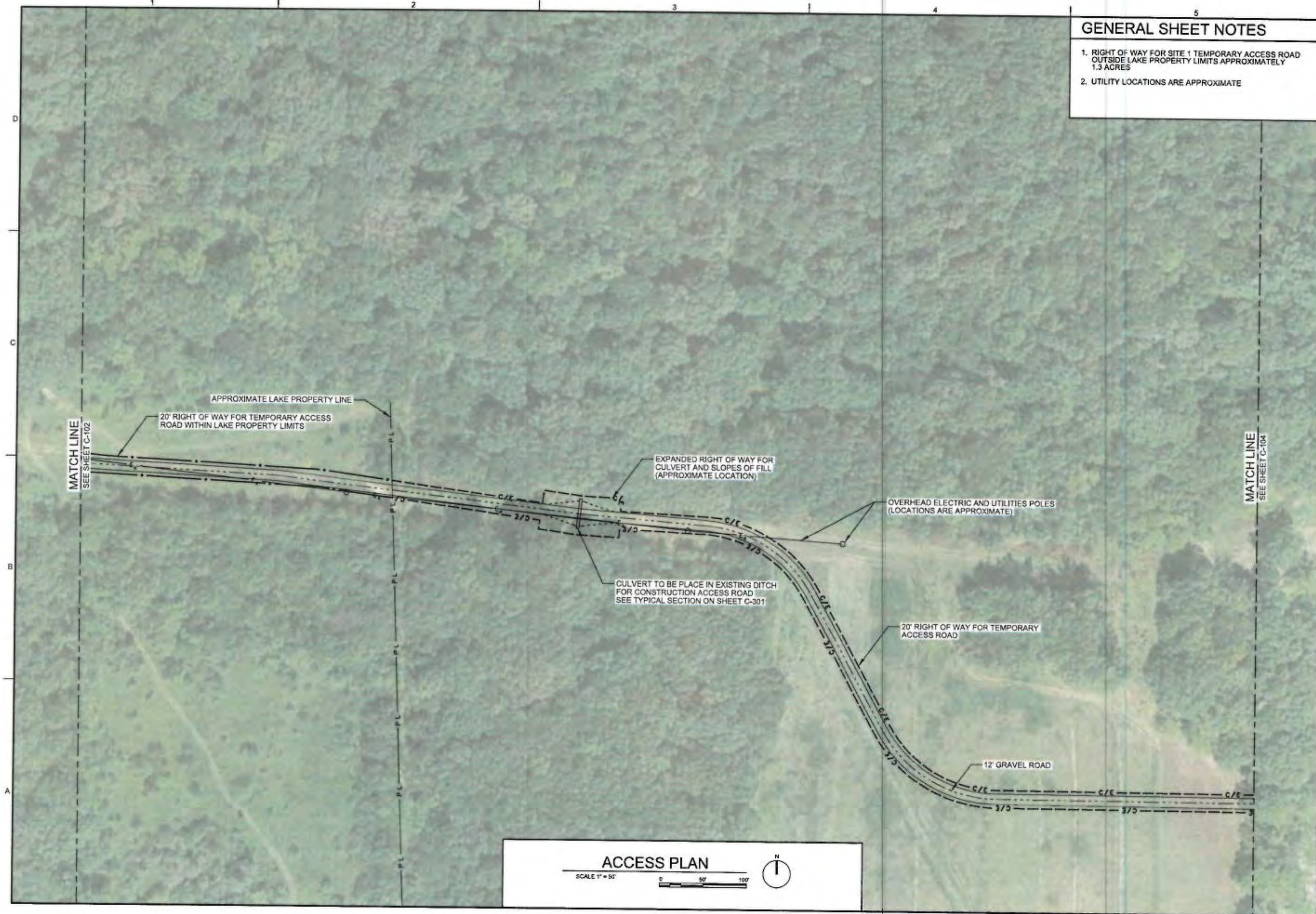
U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI 63103

DESIGNED BY:		DATE:
DWN BY:	CKD BY:	SOLICITATION NO.:
SUBMITTED BY:		CONTRACT NO.:
PLOT SCALE: 1:1	PLOT DATE: NO	FILE NUMBER:
SIZE: ANSI D	FILE NAME: LLY_C-102.dgn	

LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 1 ACCESS PLAN
SHEET 1 OF 3

PLATE
C-102



GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 1 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.3 ACRES
2. UTILITY LOCATIONS ARE APPROXIMATE

US Army Corps of Engineers

DRAFT

MARK	DESCRIPTION	DATE	APPR	MARK	DESCRIPTION	DATE	APPR

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI 63103

DESIGNED BY:		DATE:
DWN BY:	CKD BY:	SOLICITATION NO.:
SUBMITTED BY:		CONTRACT NO.:
PLOT SCALE: 1:1	PLOT DATE: NO	FILE NUMBER:
SIZE: ANSID	FILE NAME: LLY_C-103.dgn	

LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 1 ACCESS PLAN
SHEET 2 OF 3

PLATE
C-103

GENERAL SHEET NOTES

1. RIGHT OF WAY FOR SITE 1 TEMPORARY ACCESS ROAD OUTSIDE LAKE PROPERTY LIMITS APPROXIMATELY 1.3 ACRES

US Army Corps of Engineers

DRAFT

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
ST. LOUIS, MISSOURI 63103

DESIGNED BY: | DATE:
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
PLOT SCALE: 1:1 | PLOT DATE: NO | FILE NUMBER:
SIZE: ANSI D | FILE NAME: LLY_C-104.dgn

LAKE LOU YAEGER
AQUATIC ECOSYSTEM RESTORATION
MONTGOMERY COUNTY
LITCHFIELD, ILLINOIS

SITE 1 ACCESS PLAN
SHEET 3 OF 3

PLATE
C-104

Illinois Historic Preservation Agency

1 Old State Capitol Plaza, Springfield, IL 62701-1512

FAX 217/524-7525
www.illinoishistory.gov

SURVEY REQUEST

Montgomery County
Litchfield
North portion of Lake, NE of I-55 & SR 16
COESTL
Aquatic Ecosystem Restoration - Lake Lou Yeager

PLEASE REFER TO: IHPA LOG #002080516

August 10, 2016

Michael K. Trimble, Ph.D., Chief
Department of the Army, St. Louis District, Corps of Engineers
Curation and Archives Analysis Branch (EC-Z)
1222 Spruce St.
St. Louis, MO 63103-2833

Dear Chief Trimble:

Thank you for requesting comments from our office concerning the possible effects of the project referenced above on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966 (16 USC 470), as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

The project area has not been surveyed and may contain prehistoric/historic archaeological resources. Accordingly, a Phase I archaeological reconnaissance survey to locate, identify, and record all archaeological resources within the project area will be required. This decision is based upon our understanding that there has not been any large scale disturbance of the ground surface (excluding agricultural activities) such as major construction activity within the project area which would have destroyed existing cultural resources prior to your project. If the area has been heavily disturbed prior to your project, please contact our office with the appropriate written and/or photographic evidence.

~~The area(s) that need(s) to be surveyed include(s) all area(s) that will be developed as a result of the issuance of the federal agency permit(s)~~ or the granting of the federal grants, funds, or loan guarantees that have prompted this review. In addition to the archaeological survey please provide clear photographs of all structures in, or adjacent to, the current project area as part of the archaeological survey report.

Enclosed you will find an attachment briefly describing Phase I surveys and a list of archaeological contracting services. THE IHPA LOG NUMBER OR A COPY OF THIS LETTER SHOULD BE PROVIDED TO THE SELECTED PROFESSIONAL ARCHAEOLOGICAL CONTRACTOR TO ENSURE THAT THE SURVEY RESULTS ARE CONNECTED TO YOUR PROJECT PAPERWORK.

If you have further questions, please contact Joe Phillippe at 217/785-1279.

Sincerely,

Rachel Leibowitz, Ph.D.
Deputy State Historic
Preservation Officer

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

DEC 0 1 2016

REPLY TO THE ATTENTION OF

E-19J

Ashley Rasnic
U.S. Army Corps of Engineers – St. Louis District
Project Management Section
1222 Spruce Street
St. Louis, Missouri 63103

RE: Draft Feasibility Report and Integrated Environmental Assessment – Lake Lou Yaeger aquatic ecosystem restoration project; City of Litchfield, Montgomery County, Illinois

Dear Ms. Rasnic:

The U.S. Environmental Protection Agency (EPA) has reviewed a Draft Feasibility Report and Integrated Draft Environmental Assessment (hereafter: Draft EA) prepared by the U.S. Army Corps of Engineers (USACE) under the National Environmental Policy Act (NEPA) for the proposed management of aquatic ecosystem habitat degradation in Lake Lou Yaeger due to sediment deposition from contributing watersheds as well as wind and ice-induced bank erosion, resulting in loss of lake depth and surface area, and loss of aquatic habitat and wetlands. The City of Litchfield is the non-federal project sponsor. This letter provides EPA's comments on the Draft EA, pursuant to NEPA, the Council on Environmental Quality's (CEQ) NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

Constructed under the Watershed Protection and Flood Prevention Act (Public Law 83-566, 1954, as amended) for water supply, flood control, and recreation, Lake Lou Yaeger (lake) is a man-made impoundment located just northeast of the City of Litchfield in Montgomery County, Illinois. The lake was created by damming the West Fork of Shoal Creek, creating an impoundment approximately 8 miles long by 0.5 mile wide, comprising approximately 1,300 acres of open water, with a shoreline length of 24.9 miles. Maximum depth of the lake is 31 feet, and it has an average depth of 10 feet. Construction began in 1964, and the lake reached normal impoundment water levels in May of 1966. Currently, the lake is used as a potable water supply by the City of Litchfield, and it also provides public access for fishing, boating, swimming and camping. The upper end of Lake Lou Yaeger is fed by three main tributaries: Blue Grass Creek, Shoal Creek, and Shop Creek (formally Shoal Creek No 2 and consisting of 3 parts, Shop Creek, Five Mile Lake and Three Mile Creek).

The purpose of the Draft EA was to develop a plan or an array of measures that could be undertaken with the objectives of restoring herbaceous emergent wetlands and improving habitat for aquatic organisms while avoiding impacts to the lake's existing dam and water supply intake, as well as avoiding or minimizing impacts to private landowners and recreation activities. The Draft EA examined sediment control measures (retention basins and strategic lake drawdowns), shoreline protection measures (revetment and breakwaters), and in-lake structural measures (plantings and fish habitat).

This project is being pursued by USACE authority of Section 206 of the Water Resources Development Act of 1996 (Public Law 104-305), as amended, which authorizes the Secretary of the Army to carry out a program of aquatic ecosystem restoration for projects of relatively smaller scope, cost and complexity.

Three measures were considered, each with varying sub-options; these measures included Sediment Control Measures, Shoreline Protection Measures, and In-Lake Structure Measures. After careful consideration of all of the potential measures, the Draft EA screened out measures that had high long-term maintenance costs, were inefficient (high cost with low benefits), were deemed ineffective, or had potential for induced flooding, recreation impacts or environmental impacts. Only measures S1 (In-Lake Sediment Retention) and L1 (Plantings) were carried forward after preliminary screening of measures. The L1 Plantings measure was determined to not be a stand-alone measure, so the two alternatives considered for further evaluation were S1 (In-Lake Sediment Retention alone) and S1L1 (In-Lake Sediment Retention with Plantings).

This screening reduced the feasible measures down to only one: the construction of in-lake sediment retention basins (considered under the Sediment Control Measures options). Four locations were considered initially but only two were found to be effective enough to be carried forward and studied in detail. After further consideration, the study team determined that the existing seed bank in the study area should be able to allow for natural regeneration and therefore the added cost of plantings would be unwarranted. Therefore, Alternative S1L1 was eliminated from further consideration. ecosystem. However, if natural revegetation does not occur within a 5-year post-construction period, supplemental planting efforts will be undertaken to ensure wetland success. The supplemental plantings would include regional native wetland plant species. Costs are included for annual post-construction monitoring, as well as the costs for potential plantings at year 5. Additionally, corrective actions/plantings could be taken as an adaptive management measure if post-project monitoring reveals an undesirable level of invasive species generation.

Construction of a rock berm (S1) was investigated at four locations. The results of the analysis for berm sites 2 and 3 revealed that there was no appreciable difference between the future without project and the future with project conditions (i.e., the areas upstream of the proposed sites for berms 2 and 3 are anticipated to convert to wetlands at approximately the same rate in both scenarios). Therefore, USACE determined there was no real benefit to investing in berms at these locations. In addition to the no-build alternative, Sites 1 and 1a were carried forward as the two viable build alternatives. Both alternatives propose construction of an in-lake rock structure (berm) which would retain sediment entering the northern part of the lake, thereby allowing the build-up of sediment there (allowing for restoring wetlands upstream of the structure) and

improving aquatic habitat downstream of the structure. The primary physical differences between the two alternatives were the specific locations and the amount of material required to build the rock berm. Appendix B (page B6) states, "*It is assumed that the contractor will dump the required large stone with a smaller choke stone on top starting on one side of the lake and working across until the in-lake berm is complete. For quantity analysis it was assumed that up to 50% of the stone could settle into the lake bed during the construction of the berm. Therefore this additional material was factored into the quantities that were used to determine the cost estimate of the structure.*"

Both alternatives are located at relatively narrow parts of the lake, downstream of the confluence of Shop Creek and Shoal Creek (inlets to the northern part of the impoundment). In both alternatives, a rock berm would be constructed between the east and west banks of the lake. Site 1 is located at the narrowest part of the lake and could possible take advantage of a private roadways and power company right-of-way that is already cleared for construction access from the east side of the lake. Site 1a avoids isolating some existing camping locations and takes advantage of easier construction access along the west side of the lake. For stability, both alternatives propose armoring 25' of both the east and west shoreline downstream of the proposed berm and armoring 10' of both the east and west shoreline upstream of the proposed berm.

Site 1a, also known as Alternative 1a, was ultimately carried forward as the Preferred Alternative, tentatively selected plan (TSP) and National Ecosystem Restoration (NER) plan. Alternative 1a proposes construction of a rock berm to encourage sediment deposition upstream of the berm, allowing for the restoration of 32 acres of emergent wetland upstream of the berm while also restoring habitat for aquatic species downstream of the berm.

EPA is aware that USACE does not typically produce a Final EA, and instead may produce an errata document generally followed by a decision document (typically a Finding of No Significant Impact (FONSI)). Regardless, our subsequent recommendations reference creation of a Final EA document.

EPA's comments on the Draft EA focus on wetlands/water resource impacts, endangered species, water quality, construction staging and access, monitoring/mitigation commitments, cultural resources, and information clarification, and are as follows.

WETLANDS/WATER RESOURCES

- In order to access Site 1A for rock berm construction, the Draft EA states that upgrades to existing road/pathways will be necessary to allow for construction equipment access and maintenance access. It is assumed that such upgrades will require grading, widening, and potential paving/graveling of the access road.

  Recommendation: A wetland delineation should be undertaken along the entire width of the proposed Site 1A access pathway. USACE regulatory staff should visit the proposed areas to be upgraded, and walk the proposed access pathway width to determine if wetlands are present within the project footprint. Alternately, the non-federal sponsor could hire a wetland consultant to perform formal wetland delineations in these areas. If wetlands are present, any impacts to wetlands must be accounted for as part of the NEPA analysis. The Clean Water Act Section 404(b)(1) guidelines require that impacts to

Waters of the U.S. be avoided. Where impacts are considered unavoidable, they should be minimized to the extent practicable. Any impacts that are unavoidable and have been minimized may require wetland mitigation. Permitting and requirements under the Clean Water Act should be further coordinated with both USACE Regulatory staff and Illinois EPA (IEPA) Section 401 Water Quality Certification staff.

FEDERALLY-LISTED SPECIES, CRITICAL HABITAT, MIGRATORY BIRDS, and STATE-LISTED SPECIES

- The Draft EA states that a Trust Resource Report was generated in May 2016 for the project area from the U.S. Fish and Wildlife's (USFWS) IPAC – Information for Planning and Conservation[1] website. Trust resource reports are designed to streamline the USFWS environmental review process. The May 2016 report noted that three Federally listed species may potentially occur in this area: the Indiana bat (*Myotis sodalis*), currently listed as endangered; the northern long-eared bat (*Myotis septentrionalis*), currently listed as threatened; and the eastern prairie fringed orchid (*Platanthera leucophaea*), listed threatened. The Draft EA states that no designated critical habitat for these or any other species is known to be present in the project area and vicinity.

  Recommendations: EPA recommends that future NEPA documentation include correspondence between USFWS and USACE. Documentation of coordination with USACE regarding trust resources should be included with NEPA documentation. Lastly, official species lists obtained from IPAC are valid for only 90 days. As such, USACE should request an 'updated' official species list for the project in IPAC before the NEPA decision document is finalized.

  Additionally, the Fish and Wildlife Coordination Act (FWCA) requires that agencies consult with USFWS and state wildlife agencies concerning the conservation of wildlife resources where the water of any stream or other water body is proposed to be controlled or modified by a Federal agency or any public or private agency operating under a Federal permit. If relevant, coordination with USFWS pursuant to FWCA should be included with future NEPA documentation.

  Finally, coordination with the Illinois Department of Natural Resources (IDNR) should take place to determine if any state-listed species are present within the proposed project area and if the proposed project could positively or negatively impact any listed species through direct or indirect impacts. Any work restriction dates (including tree clearing restriction dates or in-water work restrictions dates) or recommendations from IDNR should be discussed in future NEPA documentation. Coordination with IDNR regarding state-listed species should be included in future NEPA documentation.

[1] https://ecos.fws.gov/ipac/

WATER QUALITY

- Lake Lou Yaeger is specifically listed as impaired (i.e., not meeting water quality standards) on IEPA's Clean Water Act Section 303(d) list of impaired waterbodies. The Draft EA states on page 13, "*diagnostic/feasibility studies were completed for Lake Lou Yaeger in 1995 and implementation has since begun. Causes of impairment addressed in these studies were total particulates (TP), dissolved oxygen (DO) and total suspended solids.*" However, additional studies have been undertaken, with impairment data noted for 2002, 2004, 2006, and 2010. Additional impairments were noted in each of these sampling years.

  Recommendation: The Final EA should provide information on the current impairments listed for Lake Lou Yaeger, and describe how implementation of the proposed project could potentially affect the waterbody (with regard to specific listed impairments and aquatic life use standards).

CONSTRUCTION AND STAGING

- The Draft EA states on page 38, "It is assumed that the contractor will dump the required large stone with a smaller choke stone on top starting on one side of the lake and working across until the in-lake berm is complete." The Draft EA was not clear on how this placement would be implemented (e.g., from a boat or barge, from equipment working directly in the water, from equipment working from the top of the berm as it is built, etc.).

  Recommendations: USEPA recommends that the Final EA commit to specific measures and best management practices (BMPs) to minimize construction impacts to air quality, water resources, soil, and other regulated resources. The Final EA should also discuss proposed construction measures, including a discussion of staging areas and their locations, access to the worksite(s), how construction would be undertaken and from where, and the location of the final disposal site of any excavated materials, if applicable.

MONITORING/MITIGATION COMMITMENTS

- Page 43 of the Draft EA notes that if clearing of trees in the construction area is necessary, clearing will only be allowed between November 1 and March 31, when bats are unlikely to be present. This commitment was not stated in the Draft FONSI, which was included with the Draft EA.

  Recommendation: EPA supports the implementation of tree clearing restriction dates. USACE should commit to no tree clearing from April 1 to October 31, and this commitment should be clearly stated in the final FONSI and project bid documents and contracts.

- General project assumption #9 (Appendix C, page 6) states, "*For planning purposes, the team assumed that sufficient overwintering and cover habitat, as well as areas of dissolved oxygen in excess of 5 ppm [parts per million] would be present in the lower lake both with and without the proposed berm for the 50 year evaluation period.*" It is not clear how

USACE proposes to ensure dissolved oxygen will remain at or above 5ppm in the lower lake post-berm construction.

Recommendation: EPA recommends that the Mitigation and Adaptive Management Plan include monitoring of dissolved oxygen in the lower lake post-berm construction, particularly in mid-summer, when thermal stratification tends to develop in lakes.

- Vegetation Monitoring Performance Indicators are listed in the Monitoring and Adaptive Management Plan (Appendix H). Specifically, Vegetation Monitoring Targets (#4) are stated to be "Native wetland herbaceous species $\geq$ 75%" and "Percentage of invasive species $<$ 25%" in the created wetland areas upstream of the rock berm. However, no list of "invasive species" was provided. Common invasive plants were listed on page H-3 of Appendix H, but it is unclear if this is the list to which vegetation monitoring targets will be compared. Furthermore, this list of common wetland invasive plants did not include common reed (*Phragmites australis*), or provide Latin names for the four listed common invasive species (Johnsongrass, Reed Canary Grass, Kudzu and Japanese Hops).

  Recommendation: EPA recommends that the Mitigation and Adaptive Management Plan include a specific list of target invasive species to be monitored for in order to meet Vegetation Monitoring Targets. This list should include *Phragmites australis* and should also include Latin names for all listed target invasive species.

CULTURAL RESOURCES

- Correspondence from the State Historic Preservation Office (SHPO) dated August 10, 2016 (found in Appendix F) states that a Phase I archaeological reconnaissance survey is required within the entire project area to locate, identify, and record all archaeological resources present. The Draft EA states on page 10 that the most recently completed Phase I archaeological survey was completed in 2012 for a proposed horse campground at Lake Lou Yaeger. However, the Draft EA did not appear to be updated before publication to state that the SHPO (as of August 2016) was requiring further site investigations.

  Recommendation: The Final EA and the FONSI should clearly state when the required Phase I survey was completed, the results of the survey, and any required commitments from further coordination with the SHPO regarding cultural, historic, and archaeological resources in the project's area of potential effect.

OTHER

- Page 52 of the Draft EA states that a detailed Mitigation and Adaptive Management plan has not yet been developed. However, page 40 of the Draft EA references the detailed Mitigation and Monitoring Plan, which is found as Appendix H to the document.

  Recommendation: USACE should rectify this discrepancy.

- The Draft EA does not clearly state the length of the proposed rock berm across the lake. Draft design plans in Appendix B show station numbering from Station 0+00 to Station 7+83; EPA assumes that the approximate length of the berm for the TSP is 783 feet in length.

  Recommendation: The Final EA and the FONSI should clearly state the length of the proposed rock berm.

Thank you for the opportunity to review this Draft EA. We are available to discuss our comments with you in further detail if requested. Please send us a copy of future NEPA documents for this project, including the project's signed decision document. If you have any questions or comments regarding the content of this letter, please contact the lead project reviewer, Ms. Liz Pelloso, PWS, at 312-886-7425 or via email at pelloso.elizabeth@epa.gov.

Sincerely,

Kenneth A. Westlake, Chief
NEPA Implementation Section
Office of Enforcement and Compliance Assurance

cc (via email):
Matt Mangan, USFWS-Marion Field Office
Joe Phillippe, Illinois SHPO

Illinois Department of
Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

Bruce Rauner, Governor
Wayne A. Rosenthal, Director

December 5, 2016

Ashley Rasnic
ST. Louis District, Army Corps
1222 Spruce St.
St. Louis, MO 63103

RE: Lake Lou Yaeger Ecosystem Restoration Project
Draft Feasibility Report
IDNR Project No. 1704984

Dear Ms. Rasnic:

The Department has received the request for comments on the proposed project involving construction of a silt retention rock berm on the north end of Lake Lou Yaeger below the confluence of Shop Creek and Shoal Creek. The City of Litchfield is the non-Federal Sponsor.

Alternative 1a was selected as the preferred option as described in the Draft Feasibility Report. Access to the project site will be from the west off of Cemetery Lane. In general, the purpose of the project is to improve wetland habitat above the berm, improve aquatic habitat below the berm, reduce sedimentation in the lake, and improve water quality.

The Department has reviewed the Natural Heritage Database and identified no concerns for state protected natural resources in the project vicinity. The Department has no objections to the project and agrees that the project should help provide necessary improvements to the aquatic habitat of the lake. However, we recommend coordination with our Fisheries Division (Fred Cronin 618-931-4217) during project implementation and our Office of Water Resources (Paul Mauer 217-782-4427) during project design to determine permit needs and ensure compliance with the Rivers, Lakes, and Streams Act (615 ILCS 5).

Thank you for the opportunity to comment. Please contact me if you have any questions regarding this review.

Nathan Grider
Division of Ecosystems and Environment
217-524-0501

cc: Fred Cronin– IDNR, Fisheries
Paul Mauer – IDNR, OWR
Director's Office

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Marion Illinois Sub-Office (ES)
8588 Route 148
Marion, Illinois 62959

FWS/MISO

November 30, 2016

Colonel Anthony P. Mitchell
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

Attn: Ms. Ashley Rasnic

Dear Colonel Mitchell:

Thank you for the opportunity to review and comment on the September 2016, Draft Feasibility Report (DFR) with Integrated Environmental Assessment (EA), and Draft Finding of No Significant Impact (FONSI) for the proposed Lake Lou Yaeger Section 206 Ecosystem Restoration Project located in Montgomery County, Illinois. These comments are prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq*.); and, the National Environmental Policy Act (83 Stat. 852, as amended P.L. 91-190, 42 U.S.C. 4321 et seq.).

Resource Problems and Opportunities

The identified problem is the loss of lake depth and surface area and loss of aquatic habitat and wetlands from sediment deposition and shoreline erosion. According to the DFR, opportunities exist to restore wetland habitat, function, and process; restore shallow water fisheries habitat, and maintain deep water habitat. The proposed project involves construction of a rock berm to create a 32 acre sediment retention basin upstream of the rock berm and reduce sediment deposition downstream of the rock berm. Alternatives considered for this project included no action and two action alternatives including the preferred alternative described above.

Threatened and Endangered Species

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain from the Fish and Wildlife Service (Service) information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. The list for this proposed action includes the endangered Indiana bat (*Myotis*

sodalis), threatened eastern prairie fringed orchid (*Platanthera leucophaea*), and threatened northern long-eared bat (*Myotis septentrionalis*). There is no designated critical habitat in the project area at this time.

Information in the EA indicates that no tree clearing activities are planned; however, if any tree clearing becomes necessary than the tree clearing would occur outside the April 1 to September 30 time frame to avoid impacts to the Indiana bat and northern long-eared bat. Thus the Corps has determined the proposed project is not likely to adversely affect the Indiana bat and northern long-eared bat. Based on this information, the Service concurs the proposed project is not likely to adversely affect the Indiana bat and northern long-eared bat. Information in the EA indicates that the eastern prairie fringed orchid is not known to occur within the proposed project area, thus the Corps has determined the proposed project is not likely to adversely affect the eastern prairie fringed orchid. Based on this information, the Service concurs that the proposed project is not likely to adversely affect the eastern prairie fringed orchid. Should this project be modified or new information indicate listed or proposed species may be affected, consultation or additional coordination with this office, as appropriate, should be initiated.

Although the bald eagle has been removed from the threatened and endangered species list, it continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (BGEPA). The Service developed the National Bald Eagle Management Guidelines to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the BGEPA. The Service is unaware of any bald eagle nests in the proposed project area; however, if a bald eagle nest is found in the project area or vicinity of the project area then our office should be contacted and the guidelines implemented. A copy of the guidelines is available at:

http://www.fws.gov/midwest/eagle/pdf/NationalBaldEagleManagementGuidelines.pdf

Fish and Wildlife Resources

It is unclear in the DFR on whether the retention basin will fill in over the life of the project and what measures would be implemented at that point to address the sedimentation. It is also unclear if measures are being implemented in the watershed to reduce sedimentation entering the lake. The Service recommends that the Monitoring and Adaptive Management Plan be revised to include an evaluation of the sedimentation rates within the retention area and discussion of potential measures to address the sedimentation if it exceeds the rates anticipated. This would also include measures that other agencies or organizations are taking to reduce sedimentation from within the watershed.

Conclusions

Based on information in the DFR and EA, it appears that proposed project activities will be conducted in a manner to minimize and avoid impacts to threatened and endangered species and may be beneficial to a variety of fish and wildlife resources. Therefore, the Service has no objection to a Finding of No Significant Impact for this activity. Thank you for the opportunity

to provide comment on the DFR, EA, and Draft FONSI. For additional coordination, please contact me at (618) 997-3344, ext. 345.

Sincerely,

/s/ Matthew T. Mangan

Matthew T. Mangan
Fish and Wildlife Biologist

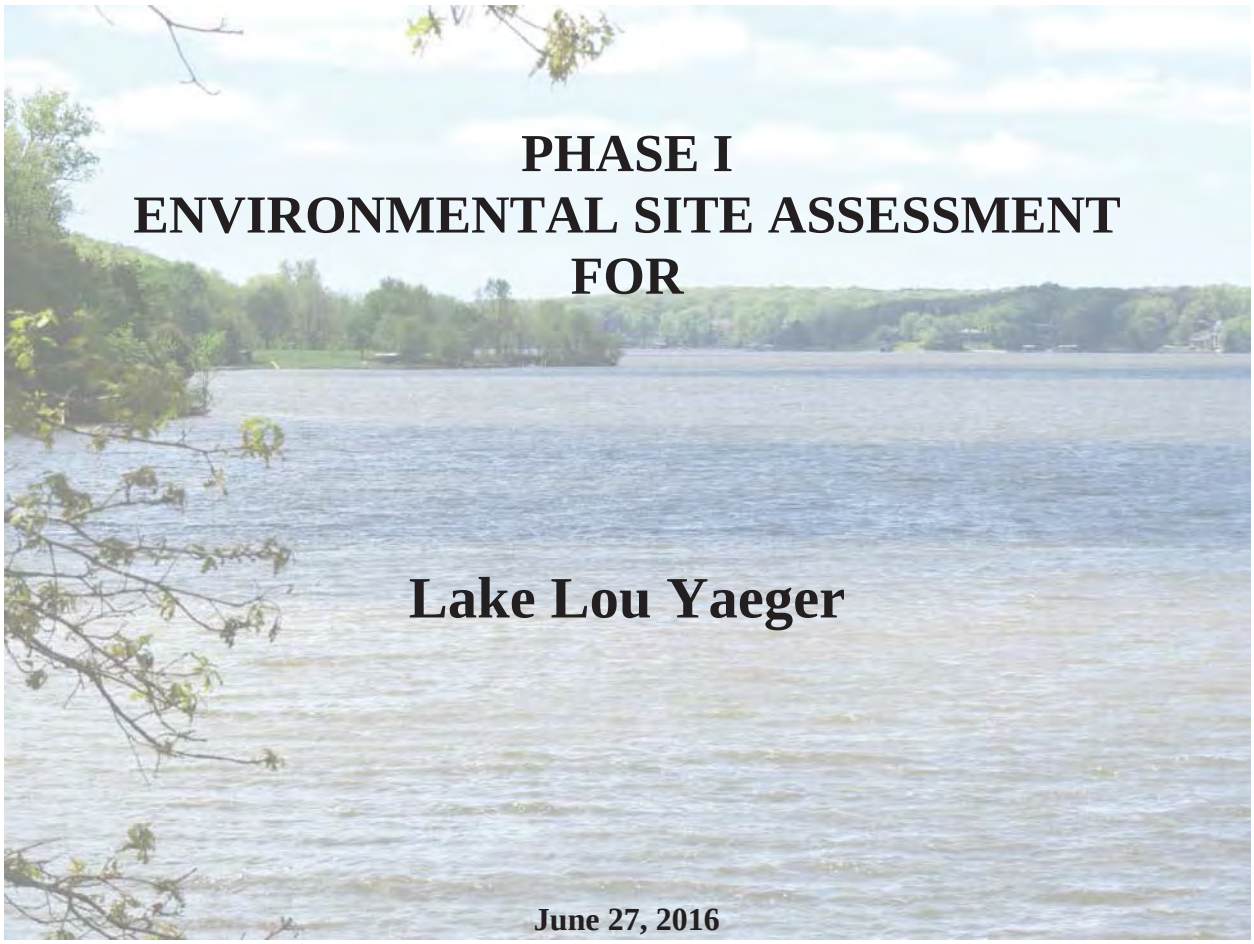
Lake Lou Yaeger, Litchfield, IL
Section 206 Feasibility Study

Responses to Public Comments

The following table summarizes the comments received during public review and the USACE response to that comment, including notation of any related changes made to the report. The full text of the comments can be found in the correspondence included in this appendix.

Comment	Response
USEPA Region 5 letter dated 01Dec16	
Wetlands/Water Resources – Recommend undertaking a wetland delineation for alternative 1a and account for any wetland impacts in the EA.	A wetland delineation will be accomplished as part of the design phase if the footprint of the access road must be expanded beyond the existing footprint. No change to the EA.
Listed Species – Include correspondence with USFWS and IDNR and update listed species before finalization of the EA.	The listed species were checked in January 2017 and no additional species were identified. No change.
Water Quality – Provide information on current impairments in the lake and describe how the project could potentially affect the waterbody with regard to these impairments.	The project will not have any significant effect on existing impairments in the lake. Additional information was added to Water Quality Sections 2.5.2 and 9.2.8.
Construction and Staging – Recommend the EA commit to specific measures and best management practices to minimize construction impacts to air quality, water resources, soil and other regulated resources. Also include information on staging areas and disposal.	Additional information was added to Section 6.2 (Construction Considerations)
Monitoring/Mitigation – Include tree clearing restriction dates in the FONSI and contract documents.	Concur. FONSI updated and contract documents will contain that restriction.
Monitoring/Mitigation – Recommend that the Monitoring and Adaptive Management Plan include monitoring of dissolved oxygen in the lower lake.	Changes to dissolved oxygen levels are not included in the specific objectives of this project. No changes.
Monitoring/Mitigation – Recommend the Monitoring and Adaptive Management Plan include a specific list of target invasive species to be monitored.	A list of invasive species was added to Appendix H.
Cultural Resources – The Final EA and FONSI should state clearly when the required Phase I survey was completed, the results of the survey, and any required commitments from further coordination with the SHPO.	The report indicates that a Phase I survey will be completed as part of the design phase. The SHPO did not provide any additional comments during the public review. No changes to the EA.

Comment	Response
Other – Conflicting statements in the report regarding the development of a detailed Monitoring and Adaptive Management Plan.	Concur and corrected Section 6.5.
Other – The Final EA and FONSI should clearly state the length of the proposed rock berm.	Concur. Approximate length of rock berm added to Section 5 and FONSI.
U.S. Fish and Wildlife Service letter dated 30Nov16	
Fish and Wildlife Resources – Recommend that the Monitoring and Adaptive Management Plan be revised to include an evaluation of the sedimentation rates within the retention area and discussion of potential measures to address sedimentation if it exceeds the rates anticipated.	Non-concur. Sedimentation monitoring and remedial measures would be cost prohibitive. Downstream benefits will be obtained regardless of the sedimentation rate. Upstream wetland creation may be affected by very high sedimentation rates but the projection of sediment accumulation already utilizes conservative (relatively high) estimates for sediment transportation rates. No changes to the document.
Illinois Department of Natural Resources letter dated 5Dec16	
Recommend coordination with IDNR Fisheries Division during project implementation and Office of Water Resources during project design to determine permit needs and ensure compliance with the Rivers, Lakes, and Streams Act.	Concur. No changes.



PHASE I
ENVIRONMENTAL SITE ASSESSMENT
FOR

Lake Lou Yaeger

June 27, 2016

Prepared By
U.S. Army Corps of Engineers
St. Louis District

Phase I – Environmental Site Assessment
Lake Lou Yaeger
Litchfield, IL

Prepared for:
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, MO 63103

Approved by:

[redacted]

Chief, Environmental Quality Section

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in 40 CFR 312.10. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

[redacted]

Environmental Engineer

Table of Contents

Appendices

Executive Summary

A Phase I Environmental Site Assessment was conducted for the Lake Lou Yaeger Project. The depth of the lake varies from 5.6 feet on the northern edge to approximately 30 feet near the dam. Since its construction in 1966 the lake has been accumulating sediment in the northern portion of the lake from its tributaries. In addition, large amounts of sediment entered the western side of the lake during the construction of Interstate 55 in the early 1970's. This accumulation of sediment has led to the loss of lake depth, especially in the northern portion where approximately 4 feet of sediment has accumulated reducing the depth in this area to 2 feet for most of the year. This reduced depth has contributed to loss of fish habitat and has limited plant species diversity. In addition, suspended sediments has decreased water quality by increasing temperatures and decreasing dissolved oxygen which affect several varieties of game fish. The Lake Lou Yaeger restoration project has been authorized under the Water Resource Development Act (WRDA) of 1996. It allows the Corps of Engineers to study, design and construct restoration projects in aquatic ecosystems that have not already been specifically authorized by Congress. The object of an aquatic ecosystem restoration project is to restore degraded ecosystem structure, function, and dynamic processes to a less degraded, more natural condition. The objectives of this project are to: reduce sedimentation, improve connectivity between the northern tributaries and lake, improve dissolved oxygen, increase quality and quantity of native fish, increase underwater habitat structure, and to reduce shoreline erosion. This will be accomplished by constructing a rock berm to trap sediment entering from the upper part of the lake and its tributaries. This berm would retain sediment thereby restoring emergent wetland habitat and creating shallow water fisheries habitat.

This due diligence effort is intended to provide the minimum information required to assess potential environmental liabilities associated with this project. The objective of the Phase I is to identify, to the extent feasible pursuant to the process described herein, recognized environmental conditions (RECs) in connection with a given property(s). This assessment revealed no RECs in connection with this project.

I. Introduction

1.1 Purpose

The U.S. Army Corps of Engineers (USACE) regulations (ER 1165-2-132 and ER 200-2-3), and District policy requires procedures be established to facilitate early identification and appropriate consideration of potential hazardous, toxic, or radioactive waste (HTRW) in reconnaissance, feasibility, preconstruction engineering and design, land acquisition, construction, operations and maintenance, repairs, replacement, and rehabilitation phases of water resources studies or projects by conducting HTRW Initial Hazard Assessments (IHA). USACE specifies that these assessments follow the process/standard practices for conducting Phase I Environmental Site Assessments (ESA) published by the American Society for Testing and Materials (ASTM).

This assessment was prepared using the following ASTM Standards:

- E1527-13: Standard Practice for Environmental Site Assessments – Phase I Environmental Site Assessment process

- E1528-06: Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (interview questionnaires)

- E2247-08 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property

The purpose of a Phase I ESA is to identify, to the extent feasible in the absence of sampling and analysis, the range of contaminants (i.e. RECs) within the scope of the U.S. Environmental Protection Agency's (EPA) Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

The scope of this Phase I consist of the following four components:

a. Records review
b. Site reconnaissance
c. Interviews
d. Report

II. Project/Site Description

2.1 Location Description

Lake Lou Yaeger is a 1,205 acre lake located just northeast of the town of Litchfield, Illinois. It is 48 miles northeast of St. Louis, Missouri and 37 miles south of Springfield, Illinois. The lake was constructed in 1966 under Public Law 566 for water supply, flood control, and recreation. The lake and a 10 foot wide riparian corridor are owned by the City of Litchfield, and provide public access for fishing, boating,

swimming, and camping. The lake is on the West Fork Shoal Creek (a tributary to Shoal Creek, which is a tributary to the Kaskaskia River). See figures 1 & 2 for site location.

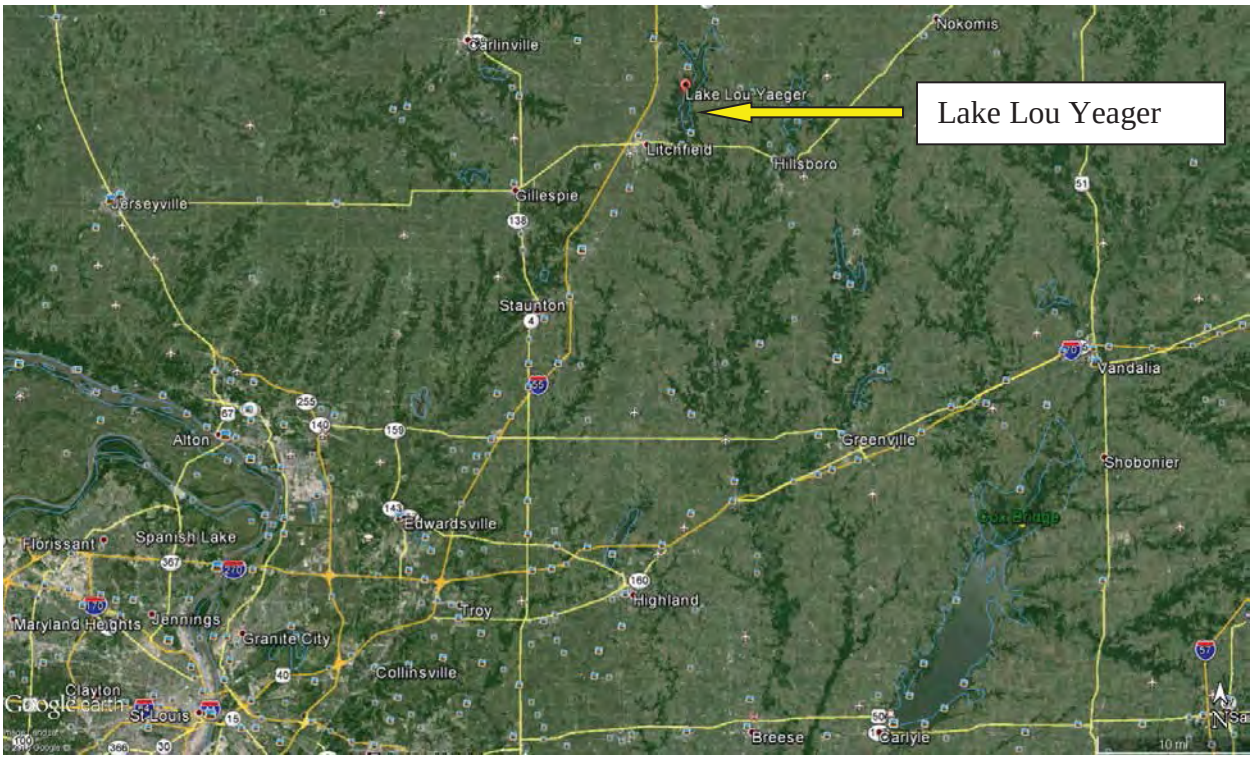


Figure 1
Locator map for Lake Lou Yaeger

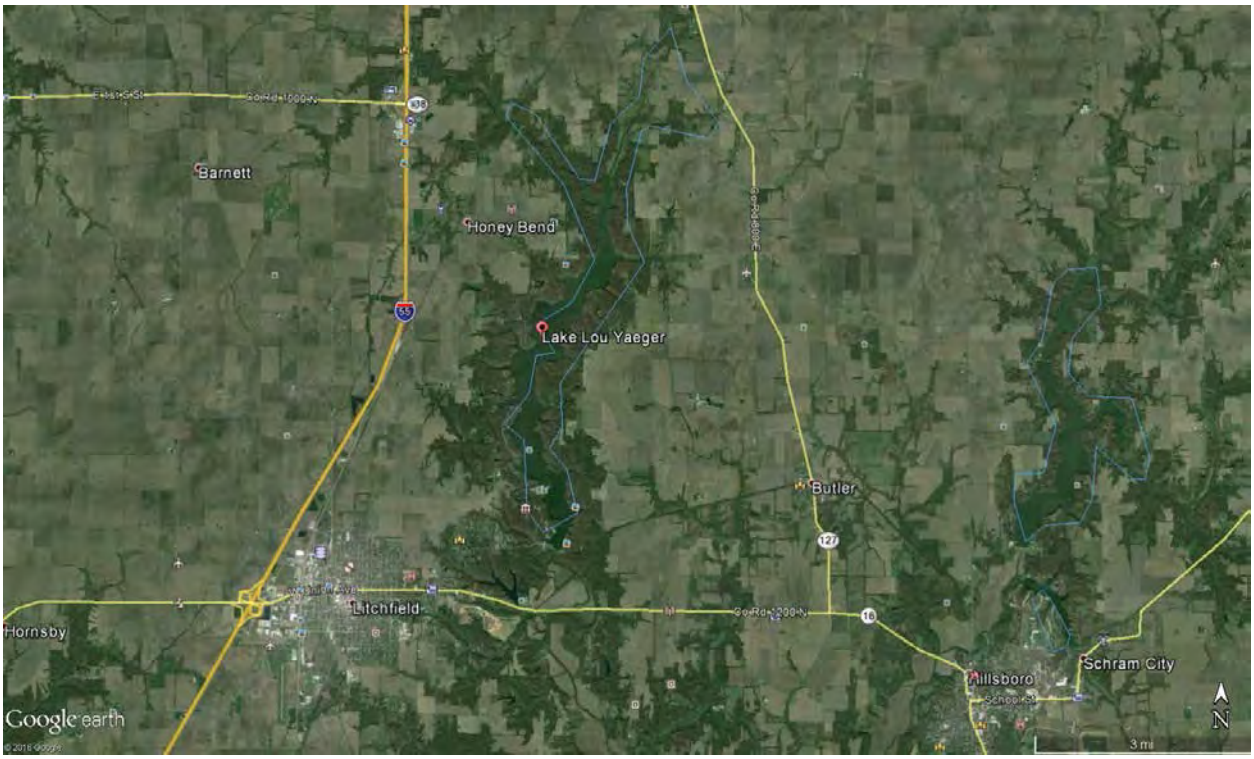


Figure 2
Lake Lou Yeager vicinity map

This project will consist of construction of a rock berm just below the confluence of the West Fork Shoal Creek and Five Mile Creek. This berm will trap sediment entering from the upper part of the lake and its tributaries. This berm would retain sediment thereby restoring emergent wetland habitat and creating shallow water fisheries habitat. The rock berm would be constructed from the east bank to the west bank of the lake. The initial design calls for the top of the berm to be 6 inches below the height of the spillway crest and will not have a notch in the structure. There are 2 possible locations of the berm. Site 1 is the primary and 1A is the alternate site. See figure 3 for locations of berm.

Figure 3
Potential locations of berm.

2.2 Site/Vicinity Characteristics

Lake Lou Yaeger is owned by the City of Litchfield, Illinois in Montgomery County. The lake has a surface area of 1,205 acres and a maximum depth of 32 feet. The lake is 6 miles long and has a maximum width of three quarters of a mile with a 27 mile shoreline. It has a storage volume of 11,560 acre-feet and average retention time of 71 days. Its watershed covers 74,550 acres which is mostly rural with 79% cropland, 11% forestland, 5% scattered homes, 3% pasture, and 2% recreational facilities. People in the watershed live in the rural communities of Honey Bend, Raymond, and the northeastern portion of Litchfield with a population of 6,815. The lake also provides the water needs for this portion of Litchfield plus an additional 1,750 users outside the city.

III. User Provided Information

Site visits, records search, and personal interviews with persons familiar with the area and local hazardous response personnel revealed the remote possibility of encountering HTRW issues. The environmental impact for the migration of off-site contaminants onto the project property is negligible.

IV. Records Review

For the purpose of this Phase I, the following standard records sources were obtained and reviewed to assist in the identification of potential REC's in connection with this project:

- National Response Center (NRC)
- Historical Aerial Photographs
- USACE Historical Information
- Historical Topographic Maps

These records assist in meeting the requirements of EPA's Standards and Practices for All Appropriate Inquires (40 CFR Part 312), and the ASTM Standard Practice for Environmental Site Assessments (E 1527-05). For properties that contained inadequate address information for mapping purposes, reasonable efforts were made to identify the approximate location of the sites in relation to the target properties as part of the review process. In addition, the physical setting was assessed for the target properties by reviewing topographic maps to identify conditions in which hazardous substances or petroleum products could migrate.

4.1 Historical Use Information

The following available historic information sources were obtained and reviewed:
The following historical aerial photographs were reviewed:
1938, 1973, 1975, 1986, 1988, 2005, 2006, 2007, 2009, 2010, 2011, and 2012

The following historical topographic maps were reviewed:
1923, 1925, 1974, 1979, 1998, and 2012

No sanborn maps were available for this area. Review of land use maps reveal that the majority of land adjacent to the project is rural and has been vacant or used for agriculture.

V. Site Reconnaissance

A site visit to Lake Lou Yaeger was conducted on 28 April 2016 by Mr. Rick Archeski and Michael Henry of CEMVS-EC-EQ. In addition, the surrounding adjacent properties were also inspected as part of this survey. Photographs documenting the site visit are enclosed as appendix C.

VI. Interviews

Interviews were conducted in order to obtain information indicating RECs in connection with this site. The content of the questions asked followed the questionnaire format of ASTM 1528. Interviews were conducted with the following persons:

- Tonya Flannery – City of Litchfield – City Administrator
- Dave Sumpster – City of Litchfield Fire Chief
- Chris Hawn – City of Litchfield Lake Lou Yaeger
- Dawn Lamm – Corps of Engineers, St. Louis District

Dawn Lamm visited the site and provided several of the photos in Appendix C.
Interview responses are attached to Appendix D.
No response from the city administrator, Tonya Flannery.

VII. Findings

Unknown if transformers have PCB's. However, none are in the immediate vicinity of this project. This is not considered a REC.
Underground Storage tank at the marina. This site is approximately 4 miles south of the proposed project. This is not considered a REC.
The potential for a large pesticide or herbicide spill into upper reaches of Five Mile and West Fork Shoal Creeks is minimal. This is not considered a REC.

VIII Data gaps

Due to large amount of data only the last 10 years of NRC records for Montgomery County, IL were reviewed.

IX. Opinion

An Environmental Site Assessment was conducted in conformance with the scope and limitations of ASTM Practice E 1527 for Lake Lou Yaeger. This assessment revealed no RECs that will affect the project in connection with these properties.

X. Conclusions

An Environmental Site Assessment Phase I ESA was conducted in accordance with the scope and limitations of ASTM Practice E 1527 for Lake Lou Yeager. The assessment revealed no RECs in connection with these properties. Pesticide application can be a potential REC for agricultural properties. However, the properties appear to be routinely farmed and still in production. Therefore, land management practices would include routine ground tilling that would induce phyto and biodegradation of residual pesticides thus are not likely to impact these sites. Therefore, no Phase II ESA is necessary for the proposed project.

XI. Limitations

U.S. Army Corps of Engineers, Environmental Quality and HTRW Section should be contacted with any known or suspected variations from the conditions described herein. If future development of the property indicates the presence of

hazardous or toxic materials, USACE should be notified to perform a re-evaluation of the environmental conditions.

The scope of this assessment did not include any additional environmental investigation, not outlined herein, or analyses for the presence or absence of hazardous or toxic materials in the soil, ground water, surface water, or air, in on, under or above the subject tract.

This site assessment was performed in accordance with generally accepted practices of consultants undertaking similar studies at the same time and in the same geographical area, and USACE observed that degree of care and skill generally exercised by consultants under similar circumstances and conditions. The findings and conclusions stated herein must be considered not as scientific certainties, but rather as professional opinions concerning the significance of the limited data gathered during the course of the environmental site assessment. No other warranty, express or implied, is made.

Specifically, USACE does not and cannot represent that the site contains no hazardous waste or material, oil (including petroleum products), or other latent condition beyond that observed by USACE during its site assessment.

The observations described in this report were made under the conditions stated herein. The conclusions presented in the report were based solely upon the services described therein, and not on scientific tasks or procedure beyond the scope of described services or the time and budgetary constraints imposed by the client. Furthermore, such conclusions are based solely on site condition, and rules and regulations, which were in effect, at the time of the study.

In preparing this report, USACE relied on certain information provided by state and local officials and other parties referenced therein, and on information contained in the files of state and/or local agencies available to USACE at the time of the site assessment. Although there may have been some degree of overlap in the information provided by these various sources, an attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this site assessment was not made.

Observations were made of the site and of structures on the site as indicated within the report. Where access to portions of the site or to structures on the site was unavailable or limited, USACE renders no opinion as to the presence of indirect evidence relating to hazardous waste or material or oil, or other petroleum products in that portion of the site or structure. In addition, USACE renders no opinion as to the presence of hazardous waste or material, oil or other petroleum products or to the presence of indirect evidence relating to hazardous material, oil, or petroleum products where direct observation of the interior walls, floor, roof, or ceiling of a structure on a site was obstructed by objects or coverings on or over these surfaces.

Unless otherwise specified in the report, USACE did not perform testing or analyses to determine the presence or concentration of asbestos, radon, formaldehyde, lead-based paint, lead in drinking water, electromagnetic fields (EMFs) or polychlorinated biphenyls (PCBs) at the site or in the environment at the site.

The purpose of this report was to assess the physical characteristics of the subject site with respect to the presence in the environment of hazardous waste or material, oil, or petroleum products. Except as otherwise described in this report, no specific attempt was made to check on the compliance of present or past owners or operators of the site with federal, state, or local laws and regulations, environmental or otherwise.

XII References

- *E1527-13: Standard Practice for Environmental Site Assessments – Phase I Environmental Site Assessment Process, ASTM*

- *E1528-06: Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (interview questionnaire), ASTM*

- *E2247-08 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property*

XIII Qualifications

USACE EC-HQ has the specific qualifications based on education, training and experience to assess a property of the nature, history, and setting of the subject properties and declare that, to the best of our professional knowledge and belief meet the definitions of Environmental Professionals as defined under 40 CFR 312.

APPENDIX A
Environmental Data

Lake Lou Yeager
Hwy 55
Butler, IL 62015

Inquiry Number: 4552953.2s
March 28, 2016

The EDR Radius Map™ Report with GeoCheck®

Prepared using the EDR FieldCheck® System

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of the environmental records was conducted by Environmental Data Resources, Inc. (EDR). U.S. ARMY CORPS OF ENGINEERS used the EDR FieldCheck System to review and/or revise the results of this search, based on independent data verification by U.S. ARMY CORPS OF ENGINEERS. The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

HWY 55
BUTLER, IL 62015

COORDINATES

Latitude (North):	39.2529830 - 39° 15' 10.73''
Longitude (West):	89.5893060 - 89° 35' 21.50''
Universal Tranverse Mercator:	Zone 16
UTM X (Meters):	276567.0
UTM Y (Meters):	4347838.0
Elevation:	590 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5681568 RAYMOND, IL
Version Date:	2012
South Map:	5681518 BUTLER, IL
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20120612
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
HWY 55
BUTLER, IL 62015

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No sites were identified in following databases.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent CERCLIS

SSU ---------- State Sites Unit Listing

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Available Disposal for Solid Waste in Illinois - Solid Waste Landfills Subject to State Surcharge
CCDD ---------- Clean Construction or Demolition Debris
LF SPECIAL WASTE ---------- Special Waste Site List
IL NIPC ---------- Solid Waste Landfill Inventory

State and tribal leaking storage tank lists

LUST ---------- Leaking Underground Storage Tank Sites
INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land
LUST TRUST ---------- Underground Storage Tank Fund Payment Priority List

State and tribal registered storage tank lists

FEMA UST ---------- Underground Storage Tank Listing
UST ---------- Underground Storage Tank Facility List
AST ---------- Above Ground Storage Tanks
INDIAN UST ---------- Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

ENG CONTROLS ---------- Sites with Engineering Controls
INST CONTROL ---------- Institutional Controls

State and tribal voluntary cleanup sites

SRP ---------- Site Remediation Program Database
INDIAN VCP ---------- Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS ---------- Municipal Brownfields Redevelopment Grant Program Project Descriptions

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---------- Open Dump Inventory

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---------- Delisted National Clandestine Laboratory Register

CDL ---- Meth Drug Lab Site Listing
US CDL ---- National Clandestine Laboratory Register

Local Land Records

LIENS 2 ---- CERCLA Lien Information

Records of Emergency Release Reports

HMIRS ---- Hazardous Materials Information Reporting System
SPILLS ---- State spills
SPILLS 90 ---- SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR ---- RCRA - Non Generators / No Longer Regulated
FUDS ---- Formerly Used Defense Sites
DOD ---- Department of Defense Sites
SCRD DRYCLEANERS ---- State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ---- Financial Assurance Information
EPA WATCH LIST ---- EPA WATCH LIST
2020 COR ACTION ---- 2020 Corrective Action Program List
TSCA ---- Toxic Substances Control Act
TRIS ---- Toxic Chemical Release Inventory System
SSTS ---- Section 7 Tracking Systems
ROD ---- Records Of Decision
RMP ---- Risk Management Plans
RAATS ---- RCRA Administrative Action Tracking System
PRP ---- Potentially Responsible Parties
PADS ---- PCB Activity Database System
ICIS ---- Integrated Compliance Information System
FTTS ---- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ---- Material Licensing Tracking System
COAL ASH DOE ---- Steam-Electric Plant Operation Data
COAL ASH EPA ---- Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ---- PCB Transformer Registration Database
RADINFO ---- Radiation Information Database
HIST FTTS ---- FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ---- Incident and Accident Data
CONSENT ---- Superfund (CERCLA) Consent Decrees
INDIAN RESERV ---- Indian Reservations
FUSRAP ---- Formerly Utilized Sites Remedial Action Program
UMTRA ---- Uranium Mill Tailings Sites
LEAD SMELTERS ---- Lead Smelter Sites
US AIRS ---- Aerometric Information Retrieval System Facility Subsystem
US MINES ---- Mines Master Index File
FINDS ---- Facility Index System/Facility Registry System
AIRS ---- Air Inventory Listing
BOL ---- Bureau of Land Inventory Database
CHICAGO ENV ---- Environmental Records Dataset
COAL ASH ---- Coal Ash Site Listing
DRYCLEANERS ---- Illinois Licensed Drycleaners
Financial Assurance ---- Financial Assurance Information Listing
HWAR ---- Hazard Waste Annual Report

IMPDMENT Surface Impoundment Inventory
NPDES A Listing of Active Permits
PIMW Potentially Infectious Medical Waste
TIER 2 Tier 2 Information Listing
UIC Underground Injection Wells
FUELS PROGRAM EPA Fuels Program Registered Listing
ECHO Enforcement & Compliance History Information

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP EDR Proprietary Manufactured Gas Plants
EDR Hist Auto EDR Exclusive Historic Gas Stations
EDR Hist Cleaner EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS Recovered Government Archive State Hazardous Waste Facilities List
RGA LF Recovered Government Archive Solid Waste Facilities List
RGA LUST Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

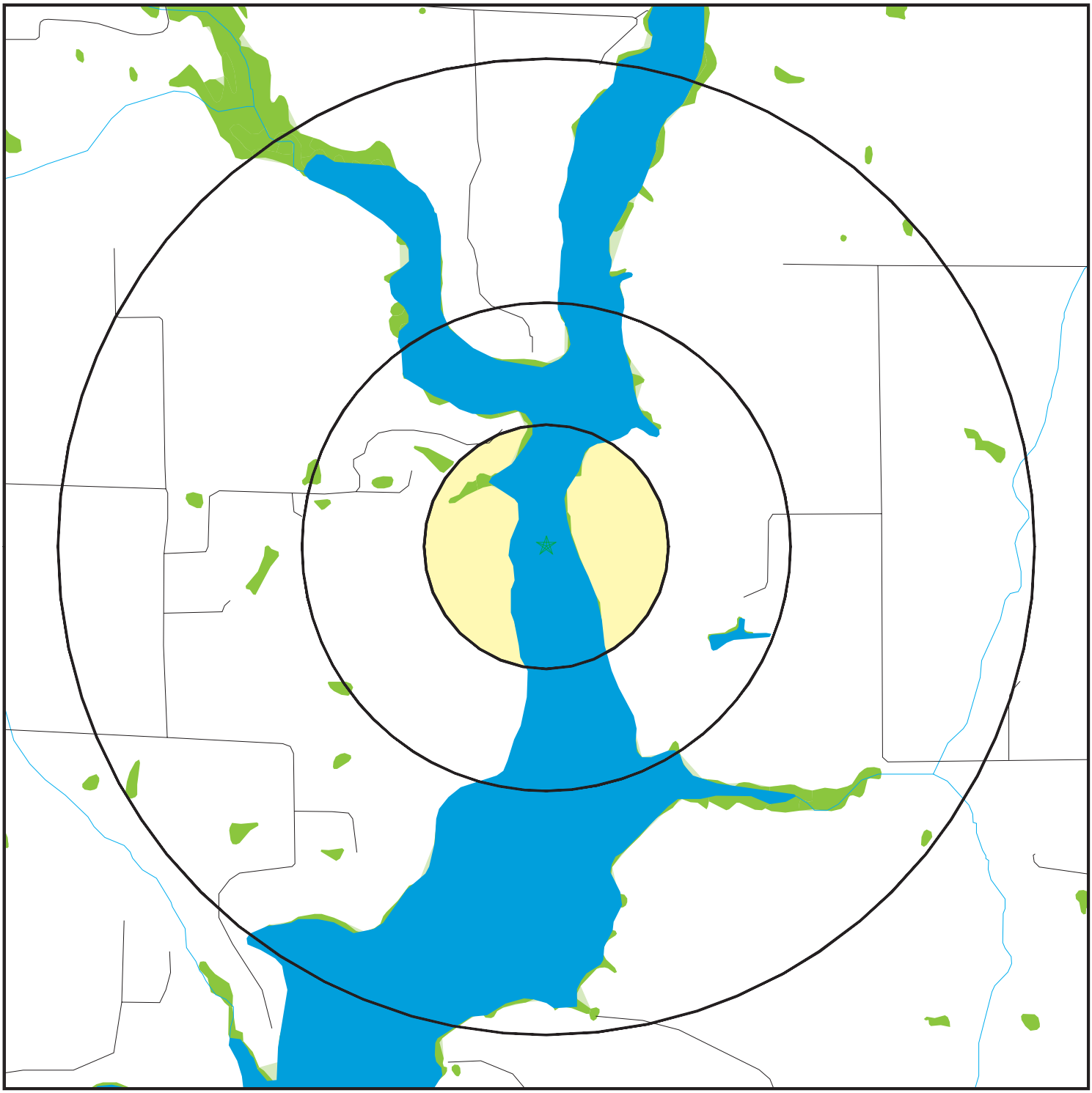
Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 8 records.

Site Name	Database(s)
LITCHFIELD MUNICIPAL TBS	SWF/LF
RONS TAVERN	UST
MORTON BUILDINGS INC	UST
NEW HOPE SCHOOL	UST
MORTON BLDG INC	RCRA NonGen / NLR
MCKAY AUTO PARTS INC	RCRA NonGen / NLR
AREA DISPOSAL SVC (SPILL)	RCRA NonGen / NLR
MCCONATHYS JIM AMOCO	RCRA-CESQG

OVERVIEW MAP - 4552953.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- National Wetland Inventory
- State Wetlands

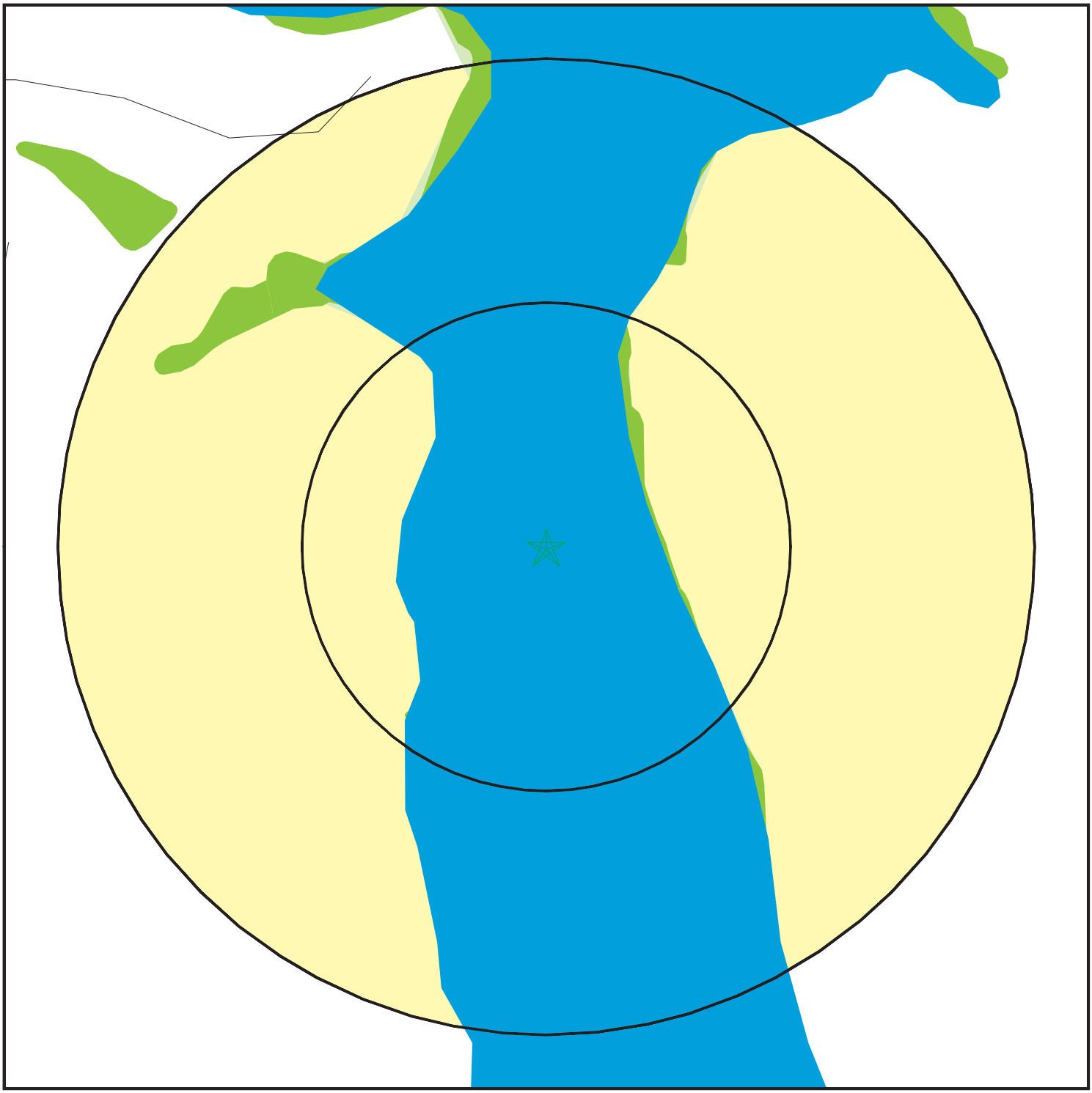
0 1/4 1/2 1 Miles

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Lake Lou Yeager	CLIENT:	U.S. Army Corps of Engineers
ADDRESS:	Hwy 55 Butler IL 62015	CONTACT:	Rick Archeski
		INQUIRY #:	4552953.2s
LAT/LONG:	39.252983 / 89.589306	DATE:	March 28, 2016 8:33 am

DETAIL MAP - 4552953.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

0 1/16 1/8 1/4 Miles

- Indian Reservations BIA
- National Wetland Inventory
- State Wetlands

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Lake Lou Yeager ADDRESS: Hwy 55 Butler IL 62015 LAT/LONG: 39.252983 / 89.589306	CLIENT: U.S. Army Corps of Engineers CONTACT: Rick Archeski INQUIRY #: 4552953.2s DATE: March 28, 2016 8:33 am

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SSU	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
CCDD	0.500		0	0	0	NR	NR	0
LF SPECIAL WASTE	0.500		0	0	0	NR	NR	0
IL NIPC	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
LUST TRUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS	0.500		0	0	0	NR	NR	0
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
SRP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
BOL	TP		NR	NR	NR	NR	NR	0
CHICAGO ENV	TP		NR	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HWAR	TP		NR	NR	NR	NR	NR	0
IMPDMENT	0.500		0	0	0	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
PIMW	0.250		0	0	NR	NR	NR	0
TIER 2	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA HWS	TP		NR	NR	NR	NR	NR	0
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	0	0	0	0	0	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

NO SITES FOUND

Count: 8 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BUTLER	U001139187	RONS TAVERN	RT 127	62015	UST
LITCHFIELD	1001967934	MORTON BLDG INC	RTE 16 E	62056	RCRA NonGen / NLR
LITCHFIELD	U003972833	MORTON BUILDINGS INC	RT 16	62056	UST
LITCHFIELD	U003769865	NEW HOPE SCHOOL	E 2ND ROAD & 1600 N RT #1	62056	UST
LITCHFIELD	1010415370	MCKAY AUTO PARTS INC	RT 66 AND 16	62056	RCRA NonGen / NLR
LITCHFIELD	1004693702	MCCONATHYS JIM AMOCO	I55 AND RTE 16 RR 2 BOX 7B	62056	RCRA-CESQG
LITCHFIELD	S108112170	LITCHFIELD MUNICIPAL TBS	CITY HALL	62056	SWF/LF
LITCHFIELD	1014389838	AREA DISPOSAL SVC (SPILL)	I-55 TRUCK SCALE (NORTH)	62056	RCRA NonGen / NLR

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: EPA
Telephone: N/A
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: EPA
Telephone: N/A
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: EPA
Telephone: N/A
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 03/26/2015
Date Data Arrived at EDR: 04/08/2015
Date Made Active in Reports: 06/11/2015
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/06/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 01/11/2016
Date Data Arrived at EDR: 01/22/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 56

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 01/11/2016
Date Data Arrived at EDR: 01/22/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 56

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/28/2015
Date Data Arrived at EDR: 05/29/2015
Date Made Active in Reports: 06/11/2015
Number of Days to Update: 13

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/16/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 09/11/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 53

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 09/11/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 53

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 06/22/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/29/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SSU: State Sites Unit Listing

The State Response Action Program database identifies the status of all sites under the responsibility of the Illinois EPA's State Sites Unit.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 07/29/2015
Date Made Active in Reports: 09/01/2015
Number of Days to Update: 34

Source: Illinois Environmental Protection Agency
Telephone: 217-524-4826
Last EDR Contact: 01/29/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

State and tribal landfill and/or solid waste disposal site lists

LF WMRC: Waste Management & Research Center Landfill Database

The Waste Management & Research Center Landfill Database includes records from the Department of Public Health, Department of Mines & Minerals, Illinois Environmental Protection Agency, State Geological Survey, Northeastern Illinois Planning Commission and Pollution Control Board.

Date of Government Version: 12/31/2001
Date Data Arrived at EDR: 10/06/2006
Date Made Active in Reports: 11/06/2006
Number of Days to Update: 31

Source: Department of Natural Resources
Telephone: 217-333-8940
Last EDR Contact: 09/18/2009
Next Scheduled EDR Contact: 12/28/2009
Data Release Frequency: No Update Planned

CCDD: Clean Construction or Demolition Debris

Construction and demolition (C and D) debris is nonhazardous, uncontaminated material resulting from construction, remodeling, repair, or demolition of utilities, structures, and roads.

Date of Government Version: 01/25/2016
Date Data Arrived at EDR: 01/27/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 51

Source: Illinois EPA
Telephone: 217-524-3300
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

SWF/LF: Available Disposal for Solid Waste in Illinois - Solid Waste Landfills Subject to State Surcharge

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/29/2015
Date Made Active in Reports: 09/15/2015
Number of Days to Update: 48

Source: Illinois Environmental Protection Agency
Telephone: 217-785-8604
Last EDR Contact: 01/29/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Annually

LF SPECIAL WASTE: Special Waste Site List

These landfills, as of January 1, 1990, accept non-hazardous special waste pursuant to the Illinois EPA Non-Hazardous Special Waste Definition. List A includes landfills that may receive any non-hazardous waste, Non-Regional Pollution Control Facilities are so noted. List B includes landfills designed to receive specific non-hazardous wastes. List B landfills are designated as a Regional Pollution Control Facility by RPCF, or Non-Regional Pollution Control Facility by Non-RPCF.

Date of Government Version: 01/01/1990
Date Data Arrived at EDR: 06/17/2009
Date Made Active in Reports: 07/15/2009
Number of Days to Update: 28

Source: Illinois EPA
Telephone: 217-782-9288
Last EDR Contact: 06/10/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IL NIPC: Solid Waste Landfill Inventory

Solid Waste Landfill Inventory. NIPC is an inventory of active and inactive solid waste disposal sites, based on state, local government and historical archive data. Included are numerous sites which previously had never been identified largely because there was no obligation to register such sites prior to 1971.

Date of Government Version: 08/01/1988
Date Data Arrived at EDR: 08/01/1994
Date Made Active in Reports: 08/12/1994
Number of Days to Update: 11

Source: Northeastern Illinois Planning Commission
Telephone: 312-454-0400
Last EDR Contact: 05/23/2006
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Sites

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 11/19/2015
Date Data Arrived at EDR: 01/27/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 51

Source: Illinois Environmental Protection Agency
Telephone: 217-782-6762
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/27/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 11/24/2015
Date Data Arrived at EDR: 12/01/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 34

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 01/08/2015
Date Data Arrived at EDR: 01/08/2015
Date Made Active in Reports: 02/09/2015
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 08/20/2015
Date Data Arrived at EDR: 10/30/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 111

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 03/30/2015
Date Data Arrived at EDR: 04/28/2015
Date Made Active in Reports: 06/22/2015
Number of Days to Update: 55

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/13/2015
Date Data Arrived at EDR: 10/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 118

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 11/04/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 52

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

LUST TRUST: Underground Storage Tank Fund Payment Prioirty List
In case sufficient funds are not available in the Underground Storage Tank Fund, requests for payment are entered on the Payment Priority List by "queue date" order. As required by the Environmental Protection Act, the queue date is the date that a complete request for partial or final payment was received by the Agency. The queue date is "officially" confirmed at the end of the payment review process when a Final Decision Letter is sent to the site owner.

Date of Government Version: 01/25/2016
Date Data Arrived at EDR: 01/27/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 51

Source: Illinois EPA
Telephone: 217-782-6762
Last EDR Contact: 01/19/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

State and tribal registered storage tank lists

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/08/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

UST: Underground Storage Tank Facility List

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 01/26/2016
Date Data Arrived at EDR: 01/27/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 51

Source: Illinois State Fire Marshal
Telephone: 217-785-0969
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

AST: Above Ground Storage Tanks

Listing of all aboveground tanks inspected by Office of State Fire Marshal.

Date of Government Version: 02/29/2016
Date Data Arrived at EDR: 03/03/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 15

Source: State Fire Marshal
Telephone: 217-785-1011
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 12/14/2014
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 28

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/13/2015
Date Data Arrived at EDR: 10/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 118

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/23/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 65

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 08/20/2015
Date Data Arrived at EDR: 10/30/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 111

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 11/05/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 52

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 11/24/2015
Date Data Arrived at EDR: 12/01/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 34

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

State and tribal institutional control / engineering control registries

ENG CONTROLS: Sites with Engineering Controls

Sites using of engineered barriers (e.g., asphalt or concrete paving).

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 01/07/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 42

Source: Illinois Environmental Protection Agency
Telephone: 217-782-6761
Last EDR Contact: 01/07/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

Inst Control: Institutional Controls
Legal or administrative restrictions on land use and/or other activities (e.g., groundwater use restrictions) which effectively limit exposure to contamination may be employed as alternatives to removal or treatment of contamination.

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 01/07/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 42
Source: Illinois Environmental Protection Agency
Telephone: 217-782-6761
Last EDR Contact: 01/07/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

SRP: Site Remediation Program Database
The database identifies the status of all voluntary remediation projects administered through the pre-notice site cleanup program (1989 to 1995) and the site remediation program (1996 to the present).

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 01/07/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 42
Source: Illinois Environmental Protection Agency
Telephone: 217-785-9407
Last EDR Contact: 01/07/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Semi-Annually

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142
Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/28/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Municipal Brownfields Redevelopment Grant Program Project Descriptions
The Illinois Municipal Brownfields Redevelopment Grant Program (MBRGP) offers grants worth a maximum of $240,000 each to municipalities to assist in site investigation activities, development of cleanup objectives, and performance of cleanup activities. Brownfields are abandoned or underused industrial and/or commercial properties that are contaminated (or thought to be contaminated) and have an active potential for redevelopment.

Date of Government Version: 02/11/2010
Date Data Arrived at EDR: 07/31/2014
Date Made Active in Reports: 09/08/2014
Number of Days to Update: 39
Source: Illinois Environmental Protection Agency
Telephone: 217-785-3486
Last EDR Contact: 01/29/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

BROWNFIELDS: Redevelopment Assessment Database
The Office of Site Evaluations Redevelopment Assessment database identifies the status of all properties within the State in which the Illinois EPA's Office of Site Evaluation has conducted a municipal Brownfield Redevelopment Assessment.

Date of Government Version: 01/25/2016
Date Data Arrived at EDR: 01/27/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 51

Source: Illinois Environmental Protection Agency
Telephone: 217-524-1658
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/22/2015
Date Data Arrived at EDR: 12/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/22/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 09/17/2015
Date Data Arrived at EDR: 12/04/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 76

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/01/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: No Update Planned

CDL: Meth Drug Lab Site Listing

A listing of clandestine/meth drug lab locations.

Date of Government Version: 01/13/2016
Date Data Arrived at EDR: 01/15/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 34

Source: Department of Public Health
Telephone: 217-782-5750
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/17/2015
Date Data Arrived at EDR: 12/04/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 76

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/01/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 03/11/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/02/2015
Number of Days to Update: 68

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/30/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Annually

SPILLS: State spills

A listing of incidents reported to the Office of Emergency Response.

Date of Government Version: 01/15/2016
Date Data Arrived at EDR: 01/19/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 59

Source: Illinois EPA
Telephone: 217-782-3637
Last EDR Contact: 01/08/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

IEMA SPILLS: Illinois Emergency Management Agency Spills

A listing of hazardous materials incidents reported to the Illinois Emergency Management Agency.

Date of Government Version: 02/01/2016
Date Data Arrived at EDR: 02/03/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 44

Source: Illinois Emergency Management Agency
Telephone: 217-524-0770
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 07/18/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 03/15/2013
Number of Days to Update: 71

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 03/11/2016
Next Scheduled EDR Contact: 06/20/2016
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/01/2015
Date Data Arrived at EDR: 09/03/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/16/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/09/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/12/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/15/2015
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 14

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/12/2015
Date Made Active in Reports: 06/02/2015
Number of Days to Update: 110

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/24/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/08/2016
Next Scheduled EDR Contact: 06/20/2016
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 08/01/2015
Date Data Arrived at EDR: 08/26/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 02/12/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 10/15/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 33

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/12/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/23/2015
Date Data Arrived at EDR: 02/06/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 01/08/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/26/2015
Date Data Arrived at EDR: 07/10/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 95
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 01/13/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/11/2016
Next Scheduled EDR Contact: 06/20/2016
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/29/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/07/2015
Date Data Arrived at EDR: 07/09/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/07/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/02/2015
Number of Days to Update: 46

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 09/30/2015
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/26/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 11/23/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 86

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 11/25/2014
Date Data Arrived at EDR: 11/26/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/11/2016
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/18/2015
Date Data Arrived at EDR: 09/01/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 125

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/02/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 03/04/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 03/04/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

FINDS: Facility Index System/Facility Registry System
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/20/2015
Date Data Arrived at EDR: 09/09/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 55

Source: EPA
Telephone: (312) 353-2000
Last EDR Contact: 03/08/2016
Next Scheduled EDR Contact: 06/20/2016
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AIRS: Air Inventory Listing
A listing of air permits and emissions information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 04/28/2015
Date Made Active in Reports: 05/13/2015
Number of Days to Update: 15

Source: Illinois EPA
Telephone: 217-557-0314
Last EDR Contact: 01/04/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Varies

BOL: Bureau of Land Inventory Database
Bureau of Land inventory for facility information. Data results are cross-linked with all on-line database system applications from IEPA - Bureau of Land as well as USEPA FRS database.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 12/10/2015
Date Made Active in Reports: 12/21/2015
Number of Days to Update: 11

Source: Illinois Environmental Protection Agency
Telephone: 217-785-9407
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

CHICAGO ENV: Environmental Records Dataset
This dataset serves as a lookup table to determine if environmental records exist in a Chicago Department of Public Health (CDPH) environmental dataset for a given address. COMPLAINTS: A "Y" indicates that one or more records exist in the CDPH Environmental Complaints dataset. NESHAPS and DEMOLITON NOTICES: A "Y" indicates that one or more records exist in the CDPH Asbestos and Demolition Notification dataset. ENFORCEMENT: A "Y" indicates that one or more records exist in the CDPH Environmental Enforcement dataset. INSPECTIONS: A "Y" indicates that one or more records exist in the CDPH Environmental Inspections dataset. PERMITS: A "Y" indicates that one or more records exist in the CDPH Environmental Permits dataset. TANKS: A "Y" indicates that one or more records exist in the CDPH Storage Tanks dataset.

Date of Government Version: 11/25/2015
Date Data Arrived at EDR: 12/22/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 58

Source: Chicago Department of Public Health
Telephone: 312-745-3136
Last EDR Contact: 03/24/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Varies

COAL ASH: Coal Ash Site Listing
A listing of coal ash site lcoations.

Date of Government Version: 10/01/2011
Date Data Arrived at EDR: 03/09/2012
Date Made Active in Reports: 04/10/2012
Number of Days to Update: 32

Source: Illinois EPA
Telephone: 217-782-1654
Last EDR Contact: 03/04/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Annually

DRYCLEANERS: Illinois Licensed Drycleaners
Any retail drycleaning facility in Illinois must apply for a license through the Illinois Drycleaner Environmental Response Trust Fund. Drycleaner Environmental Response Trust Fund of Illinois.

Date of Government Version: 02/22/2016
Date Data Arrived at EDR: 02/24/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 23

Source: Drycleaner Environmental Response Trust Fund of Illinois
Telephone: 800-765-4041
Last EDR Contact: 02/24/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

Financial Assurance: Financial Assurance Information Listing
Information for hazardous waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 12/15/2015
Date Data Arrived at EDR: 12/18/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 62

Source: Illinois Environmental Protection Agency
Telephone: 217-782-9887
Last EDR Contact: 02/02/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

HWAR: Hazard Waste Annual Report

Each year, Illinois hazardous-waste generators tell the Illinois EPA the amounts and kinds of hazardous waste they produced during the previous year. Generators indicate by code the types of wastes produced and the steps they took to manage these wastes. If some or all of these wastes were sent to commercial treatment, storage, and disposal facilities (TSDFs), that information and the identity of each receiving facility also are submitted. Illinois TSDFs likewise report the types and quantities of wastes received from in-state and out-of-state generators; they also report the procedures they used to manage these wastes.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 03/11/2015
Number of Days to Update: 15

Source: Illinois EPA
Telephone: 217-524-3300
Last EDR Contact: 01/08/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Annually

IMPDMENT: Surface Impoundment Inventory

Statewide inventory of industrial, municipal, mining, oil & gas , and large agricultural impoundment. This study was conducted by the Illinois EPA to assess potentail for contamination of shallow aquifers. This was a one-time study. Although many of the impoundments may no longer be present, the sites may be contaminated.

Date of Government Version: 12/31/1980
Date Data Arrived at EDR: 03/08/2002
Date Made Active in Reports: 06/03/2002
Number of Days to Update: 87

Source: Illinois Waste Management & Research Center
Telephone: 217-333-8940
Last EDR Contact: 02/20/2002
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NPDES: A Listing of Active Permits

A listing of facilities currently active in the state. The types of permits are public, private, federal and state.

Date of Government Version: 04/16/2014
Date Data Arrived at EDR: 04/18/2014
Date Made Active in Reports: 05/20/2014
Number of Days to Update: 32

Source: Illinois EPA
Telephone: 217-782-0610
Last EDR Contact: 12/30/2015
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Varies

PIMW: Potentially Infectious Medical Waste

Potentially Infectious Medical Waste (PIMW) is waste generated in connection with the diagnosis, treatment (i.e., provision of medical services), or immunization of human beings or animals; research pertaining to the provision of medical services; or the provision or testing of biologicals.

Date of Government Version: 12/21/2015
Date Data Arrived at EDR: 12/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 57

Source: Illinois EPA
Telephone: 217-524-3289
Last EDR Contact: 03/21/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Varies

TIER 2: Tier 2 Information Listing

A listing of facilities which store or manufacture hazardous materials and submit a chemical inventory report.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/17/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 30

Source: Illinois Emergency Management Agency
Telephone: 217-785-9860
Last EDR Contact: 02/17/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Annually

UIC: Underground Injection Wells

Injection wells are used for disposal of fluids by "injection" into the subsurface. The construction of injection wells range from very technical designs with twenty-four hour monitoring to simply a hole dug in the ground to control runoff. As a result of this diversity, the UIC Program divides injection wells into five different classes.

Date of Government Version: 11/12/2015
Date Data Arrived at EDR: 03/03/2016
Date Made Active in Reports: 03/18/2016
Number of Days to Update: 15

Source: Illinois EPA
Telephone: 217-782-9878
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 11/23/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 86

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/24/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/20/2015
Date Data Arrived at EDR: 09/23/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 103

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 03/23/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Natural Resources in Illinois.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Illinois Environmental Protection Agency in Illinois.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/10/2014
Number of Days to Update: 193

Source: Illinois Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Illinois Environmental Protection Agency in Illinois.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: Illinois Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/18/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 07/17/2015
Date Made Active in Reports: 08/12/2015
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 02/01/2016
Date Data Arrived at EDR: 02/03/2016
Date Made Active in Reports: 03/22/2016
Number of Days to Update: 48

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Annually

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/24/2015
Date Made Active in Reports: 08/18/2015
Number of Days to Update: 25

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/19/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 06/19/2015
Date Made Active in Reports: 07/15/2015
Number of Days to Update: 26

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 03/21/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 03/19/2015
Date Made Active in Reports: 04/07/2015
Number of Days to Update: 19

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/14/2016
Next Scheduled EDR Contact: 06/27/2016
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Homes & Centers Listing
Source: Department of Children & Family Services
Telephone: 312-814-4150

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Illinois State Geological Survey
Telephone: 217-333-4747

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

LAKE LOU YEAGER
HWY 55
BUTLER, IL 62015

TARGET PROPERTY COORDINATES

Latitude (North):	39.252983 - 39° 15' 10.74''
Longitude (West):	89.589306 - 89° 35' 21.50''
Universal Tranverse Mercator:	Zone 16
UTM X (Meters):	276567.0
UTM Y (Meters):	4347838.0
Elevation:	590 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5681568 RAYMOND, IL
Version Date:	2012
South Map:	5681518 BUTLER, IL
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

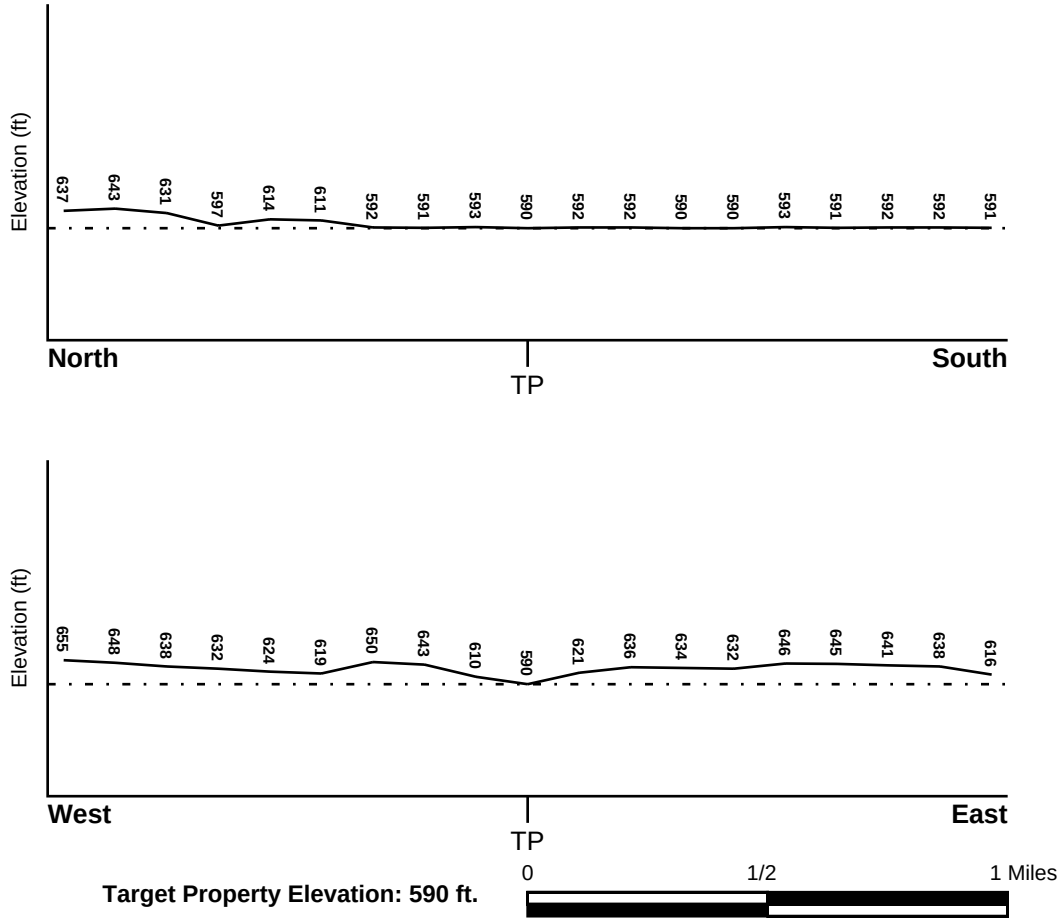
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General East

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
MONTGOMERY, IL	Not Available

Flood Plain Panel at Target Property: Not Reported

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
RAYMOND	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Paleozoic
System:	Pennsylvanian
Series:	Missourian Series
Code:	PP3 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	HOSMER
Soil Surface Texture:	silt loam
Hydrologic Group:	Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.
Soil Drainage Class:	Not reported

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel:	MODERATE
Depth to Bedrock Min:	> 60 inches
Depth to Bedrock Max:	> 60 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	10 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 2.00 Min: 0.60	Max: 6.50 Min: 4.50
2	10 inches	29 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.60	Max: 5.50 Min: 4.50
3	29 inches	80 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.06 Min: 0.00	Max: 6.00 Min: 4.50

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: loam
silty clay loam
clay loam

Surficial Soil Types: loam
silty clay loam
clay loam

Shallow Soil Types: silt loam

Deeper Soil Types: sandy loam
silty clay loam
clay loam
loam

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

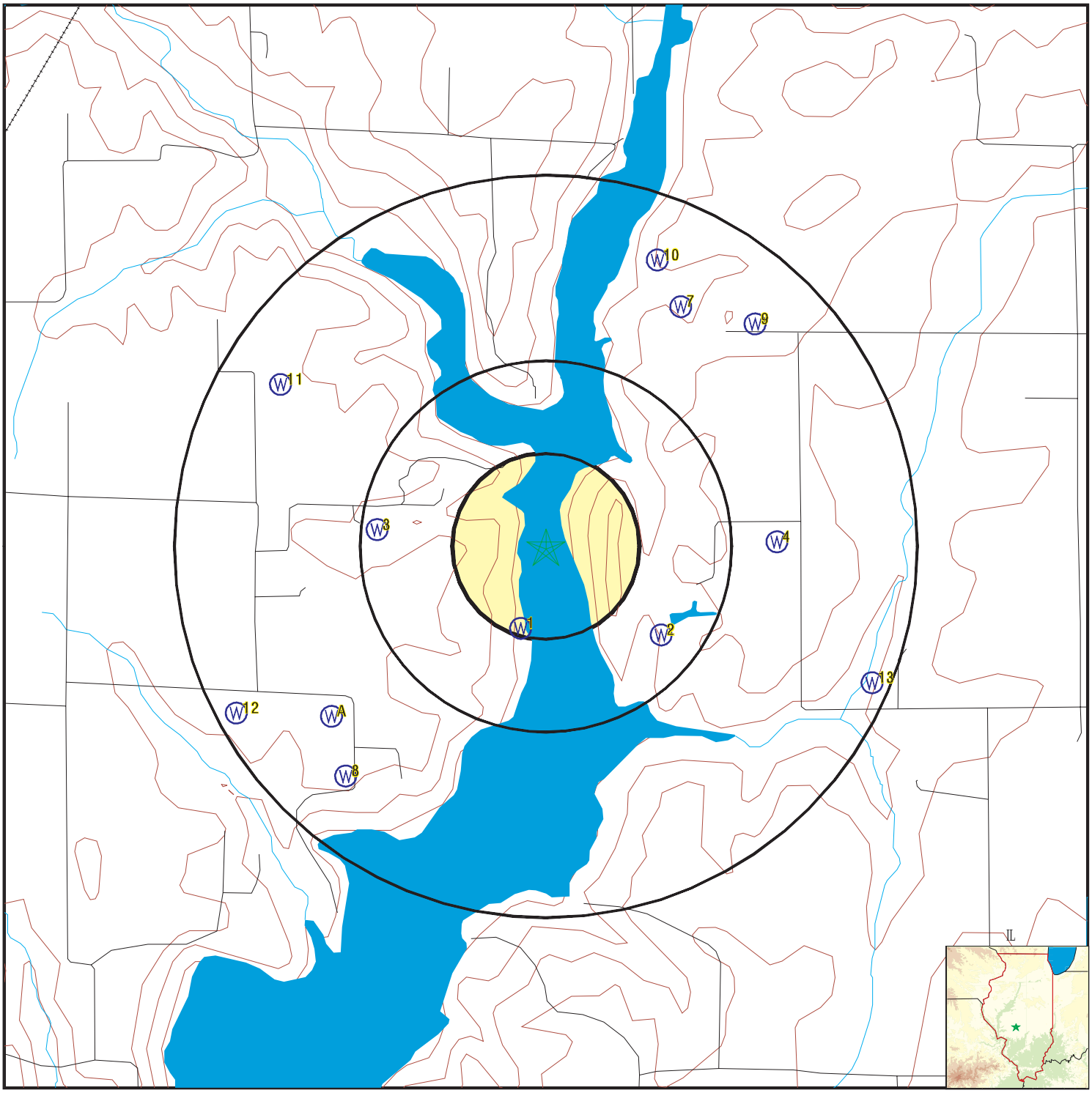
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	ILSG20000059498	1/8 - 1/4 Mile SSW
2	ILSG20000059492	1/4 - 1/2 Mile SE
3	ILSG20000059603	1/4 - 1/2 Mile West
4	ILSG20000059583	1/2 - 1 Mile East
A5	ILSG20000059382	1/2 - 1 Mile SW
A6	ILSG20000059383	1/2 - 1 Mile SW
7	ILSG20000059930	1/2 - 1 Mile NNE
8	ILSG20000059284	1/2 - 1 Mile SW
9	ILSG20000059897	1/2 - 1 Mile NE
10	ILSG20000059983	1/2 - 1 Mile NNE
11	ILSG20000059819	1/2 - 1 Mile WNW
12	ILSG20000059387	1/2 - 1 Mile WSW
13	ILSG20000059431	1/2 - 1 Mile ESE

PHYSICAL SETTING SOURCE MAP - 4552953.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data

SITE NAME:	Lake Lou Yeager	CLIENT:	U.S. Army Corps of Engineers
ADDRESS:	Hwy 55 Butler IL 62015	CONTACT:	Rick Archeski
		INQUIRY #:	4552953.2s
LAT/LONG:	39.252983 / 89.589306	DATE:	March 28, 2016 8:34 am

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
SSW | **IL WELLS** | **ILSG20000059498**
1/8 - 1/4 Mile
Higher

Pt api number:	121352374900	Pt status:	ENG
Pt longitude:	-89.59057		
Pt latitude:	39.249784		
Api number:	121352374900		
Longitude :	-89.59057		
Latitude :	39.249784		
Section:	1	Twp:	9
Tdir:	N	Rng:	5
Rdir:	W	Farm name:	Lake Lou Yeager Sediments
Farm num:	Not Reported	Company name:	owner
Status:	Engineering Test	Elevation:	0
Elevref:	Not Reported	Total depth:	0
Wformation:	Not Reported	Wfmfrom:	0
Wfmto:	0	Pumpgpm:	0

2
SE | **IL WELLS** | **ILSG20000059492**
1/4 - 1/2 Mile
Higher

Pt api number:	121352297400	Pt status:	WATER
Pt longitude:	-89.583519		
Pt latitude:	39.249527		
Api number:	121352297400		
Longitude :	-89.583519		
Latitude :	39.249527		
Section:	6	Twp:	9
Tdir:	N	Rng:	4
Rdir:	W	Farm name:	Broadus, Robert
Farm num:	Not Reported	Company name:	Beasley, Eugene B.
Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	48
Wformation:	gravel	Wfmfrom:	20
Wfmto:	24	Pumpgpm:	0

3
West | **IL WELLS** | **ILSG20000059603**
1/4 - 1/2 Mile
Higher

Pt api number:	121352378000	Pt status:	WATER
Pt longitude:	-89.597772		
Pt latitude:	39.253638		
Api number:	121352378000		
Longitude :	-89.597772		
Latitude :	39.253638		
Section:	1	Twp:	9
Tdir:	N	Rng:	5
Rdir:	W	Farm name:	Zenisek, Andrew
Farm num:	Not Reported	Company name:	Walters, Steven

Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	27
Wformation:	gravelly clay/ss	Wfmfrom:	10
Wfmto:	22	Pumpgpm:	0

4
East
1/2 - 1 Mile
Higher

IL WELLS **ILSG20000059583**

Pt api number:	121352297300	Pt status:	WATER
Pt longitude:	-89.577711		
Pt latitude:	39.253161		
Api number:	121352297300		
Longitude :	-89.577711		
Latitude :	39.253161		
Section:	6	Twp:	9
Tdir:	N	Rng:	4
Rdir:	W	Farm name:	Battin, Henry
Farm num:	Not Reported	Company name:	Beasley, Eugene B.
Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	50
Wformation:	gravel	Wfmfrom:	33
Wfmto:	34	Pumpgpm:	0

A5
SW
1/2 - 1 Mile
Higher

IL WELLS **ILSG20000059382**

Pt api number:	121352200100	Pt status:	WATER
Pt longitude:	-89.600059		
Pt latitude:	39.246351		
Api number:	121352200100		
Longitude :	-89.600059		
Latitude :	39.246351		
Section:	12	Twp:	9
Tdir:	N	Rng:	5
Rdir:	W	Farm name:	Shade, Kenneth
Farm num:	Not Reported	Company name:	owner
Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	39
Wformation:	clay	Wfmfrom:	0
Wfmto:	0	Pumpgpm:	0

A6
SW
1/2 - 1 Mile
Higher

IL WELLS **ILSG20000059383**

Pt api number:	121352242500	Pt status:	WATER
Pt longitude:	-89.600059		
Pt latitude:	39.246351		
Api number:	121352242500		
Longitude :	-89.600059		
Latitude :	39.246351		
Section:	12	Twp:	9
Tdir:	N	Rng:	5
Rdir:	W	Farm name:	Beakerhoff, B
Farm num:	Not Reported	Company name:	Beasley, Eugene B.

Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	40
Wformation:	gravel	Wfmfrom:	22
Wfmto:	24	Pumpgpm:	0

7
NNE **IL WELLS** **ILSG20000059930**
1/2 - 1 Mile
Higher

Pt api number:	121352381700	Pt status:	WATER
Pt longitude:	-89.582533		
Pt latitude:	39.262337		
Api number:	121352381700		
Longitude :	-89.582533		
Latitude :	39.262337		
Section:	31	Twp:	10
Tdir:	N	Rng:	4
Rdir:	W	Farm name:	Ohl, Timothy & Kathleen
Farm num:	Not Reported	Company name:	Kohnen, Clarence
Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	56
Wformation:	brown sand	Wfmfrom:	19
Wfmto:	38	Pumpgpm:	3

8
SW **IL WELLS** **ILSG20000059284**
1/2 - 1 Mile
Higher

Pt api number:	121350180400	Pt status:	WATER
Pt longitude:	-89.599349		
Pt latitude:	39.244018		
Api number:	121350180400		
Longitude :	-89.599349		
Latitude :	39.244018		
Section:	12	Twp:	9
Tdir:	N	Rng:	5
Rdir:	W	Farm name:	Davidson, Ralph
Farm num:	Not Reported	Company name:	owner
Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	30
Wformation:	sandy clay	Wfmfrom:	12
Wfmto:	14	Pumpgpm:	0

9
NE **IL WELLS** **ILSG20000059897**
1/2 - 1 Mile
Higher

Pt api number:	121352417000	Pt status:	WATER
Pt longitude:	-89.578806		
Pt latitude:	39.261667		
Api number:	121352417000		
Longitude :	-89.578806		
Latitude :	39.261667		
Section:	31	Twp:	10
Tdir:	N	Rng:	4
Rdir:	W	Farm name:	Weatherford, Wendell
Farm num:	Not Reported	Company name:	Central Concrete

Status:	Water Well	Elevation:	634
Elevref:	Not Reported	Total depth:	47
Wformation:	sy brown & white cl	Wfmfrom:	14
Wfmto:	16	Pumpgpm:	0

10
NNE **IL WELLS** **ILSG20000059983**
1/2 - 1 Mile
Higher

Pt api number:	121352278700	Pt status:	WATER
Pt longitude:	-89.58371		
Pt latitude:	39.264161		
Api number:	121352278700		
Longitude :	-89.58371		
Latitude :	39.264161		
Section:	31	Twp:	10
Tdir:	N	Rng:	4
Rdir:	W	Farm name:	Dickerson, James
Farm num:	Not Reported	Company name:	Link, Harold F.
Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	38
Wformation:	sand & gravel	Wfmfrom:	27
Wfmto:	38	Pumpgpm:	0

11
WNW **IL WELLS** **ILSG20000059819**
1/2 - 1 Mile
Higher

Pt api number:	121352381400	Pt status:	WATER
Pt longitude:	-89.60262		
Pt latitude:	39.259304		
Api number:	121352381400		
Longitude :	-89.60262		
Latitude :	39.259304		
Section:	1	Twp:	9
Tdir:	N	Rng:	5
Rdir:	W	Farm name:	Lemon, Clint
Farm num:	Not Reported	Company name:	Walters, Steven
Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	52
Wformation:	gravelly clay-gravel	Wfmfrom:	10
Wfmto:	27	Pumpgpm:	0

12
WSW **IL WELLS** **ILSG20000059387**
1/2 - 1 Mile
Higher

Pt api number:	121352239500	Pt status:	WATER
Pt longitude:	-89.604837		
Pt latitude:	39.246479		
Api number:	121352239500		
Longitude :	-89.604837		
Latitude :	39.246479		
Section:	11	Twp:	9
Tdir:	N	Rng:	5
Rdir:	W	Farm name:	Peters, Dan
Farm num:	Not Reported	Company name:	Beasley, Eugene B.

Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	50
Wformation:	gravel	Wfmfrom:	13
Wfmto:	20	Pumpgpm:	0

13
ESE
1/2 - 1 Mile
Higher

IL WELLS **ILSG20000059431**

Pt api number:	121352397800	Pt status:	WATER
Pt longitude:	-89.572937		
Pt latitude:	39.24766		
Api number:	121352397800		
Longitude :	-89.572937		
Latitude :	39.24766		
Section:	6	Twp:	9
Tdir:	N	Rng:	4
Rdir:	W	Farm name:	Seward, Jeffery & Amy
Farm num:	1	Company name:	Walters, Steven
Status:	Water Well	Elevation:	0
Elevref:	Not Reported	Total depth:	47
Wformation:	gray sand layered	Wfmfrom:	26
Wfmto:	32	Pumpgpm:	0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for MONTGOMERY County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for MONTGOMERY COUNTY, IL

Number of sites tested: 8

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	2.000 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	3.300 pCi/L	62%	38%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Illinois State Geological Survey
Telephone: 217-333-4747

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Records
Source: Illinois Geological Survey
Telephone: 217-333-4747

Illinois Private Well Database and PICS (Public, Industrial, Commercial Survey)
Source: Illinois State Water Survey
Telephone: 217-333-9043

Water Well Location Information
Source: Illinois Environmental Protection Agency
Telephone: 217-782-0810

OTHER STATE DATABASE INFORMATION

RADON

State Database: IL Radon
Source: Department of Nuclear Safety
Telephone: 217-785-9958
County Radon Results

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

APPENDIX B
Historical Data

Lake Lou Yeager
Hwy 55
Butler, IL 62015

Inquiry Number: 4552953.9
March 03, 2016

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Date EDR Searched Historical Sources:

Aerial Photography March 03, 2016

Target Property:

Hwy 55

Butler, IL 62015

Year	***Scale***	***Details***	***Source***
1938	Aerial Photograph. Scale: 1"=500'	Flight Date: October 21, 1938	EDR
1973	Aerial Photograph. Scale: 1"=500'	Flight Date: February 04, 1973	EDR
1975	Aerial Photograph. Scale: 1"=500'	Flight Date: November 23, 1975	EDR
1986	Aerial Photograph. Scale: 1"=1000'	Flight Date: March 21, 1986	EDR
1988	Aerial Photograph. Scale: 1"=750'	Flight Date: March 21, 1988	EDR
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	USDA/NAIP
2005	Aerial Photograph. Scale: 1"=500'	DOQQ - acquisition dates: March 06, 2005	USGS/DOQQ
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	USDA/NAIP
2007	Aerial Photograph. Scale: 1"=500'	Flight Year: 2007	USDA/NAIP
2009	Aerial Photograph. Scale: 1"=500'	Flight Year: 2009	USDA/NAIP
2010	Aerial Photograph. Scale: 1"=500'	Flight Year: 2010	USDA/NAIP
2011	Aerial Photograph. Scale: 1"=500'	Flight Year: 2011	USDA/NAIP
2012	Aerial Photograph. Scale: 1"=500'	Flight Year: 2012	USDA/NAIP


INQUIRY #: 4552953.9
YEAR: 1938
= 500'
N
EDR

INQUIRY #: 4552953.9

YEAR: 1973

= 500'

N

EDR

INQUIRY #: 4552953.9

YEAR: 1975

= 500'

N

EDR


INQUIRY #: 4552953.9
YEAR: 1986
= 1000'
N
EDR


INQUIRY #: 4552953.9
YEAR: 1988
= 750'
N
EDR


INQUIRY #: 4552953.9
YEAR: 2005
= 500'
N
EDR


INQUIRY #: 4552953.9
YEAR: 2005
= 500'
N
EDR


INQUIRY #: 4552953.9
YEAR: 2006
= 500'
N
EDR


INQUIRY #: 4552953.9
YEAR: 2007
= 500'
N
EDR


INQUIRY #: 4552953.9
YEAR: 2009
= 500'
N
EDR


INQUIRY #: 4552953.9
YEAR: 2010
= 500'
N
EDR


INQUIRY #: 4552953.9
YEAR: 2011
= 500'
N
EDR


INQUIRY #: 4552953.9
YEAR: 2012
= 500'
N
EDR

Lake Lou Yeager

Hwy 55

Butler, IL 62015

Inquiry Number: 4552953.4

March 02, 2016

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

03/02/16

Site Name:
Lake Lou Yeager
Hwy 55
Butler, IL 62015
EDR Inquiry # 4552953.4

Client Name:
U.S. Army Corps of Engineers
Svc. Base,
St. Louis, MO 63118
Contact: Rick Archeski

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by U.S. Army Corps of Engineers were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:

Site Name:	Lake Lou Yeager
Address:	Hwy 55
City,State,Zip:	Butler, IL 62015
P.O.#	NA
Project:	Lake Lou Yeager

Coordinates:

Latitude:	39.252983 39° 15' 11" North
Longitude:	-89.589306 -89° 35' 22" West
UTM Zone:	Zone 16 North
UTM X Meters:	276572.75
UTM Y Meters:	4348046.64
Elevation:	589.63' above sea level

Maps Provided:

2012
1998
1974, 1979
1925
1923

Topo Sheet Thumbnails

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets

Raymond
2012
7.5-minute, 24000

Butler
2012
7.5-minute, 24000

1998 Source Sheets

Butler
1998
7.5-minute, 24000
Aerial Photo Revised 1998

Raymond
1998
7.5-minute, 24000
Photo Inspected 1998
Aerial Photo Revised 1998

1974, 1979 Source Sheets

Butler
1974
7.5-minute, 24000
Aerial Photo Revised 1973

Raymond
1979
7.5-minute, 24000
Aerial Photo Revised 1975
Edited 1979

1925 Source Sheets

Raymond
1925
15-minute, 62500

Topo Sheet Thumbnails

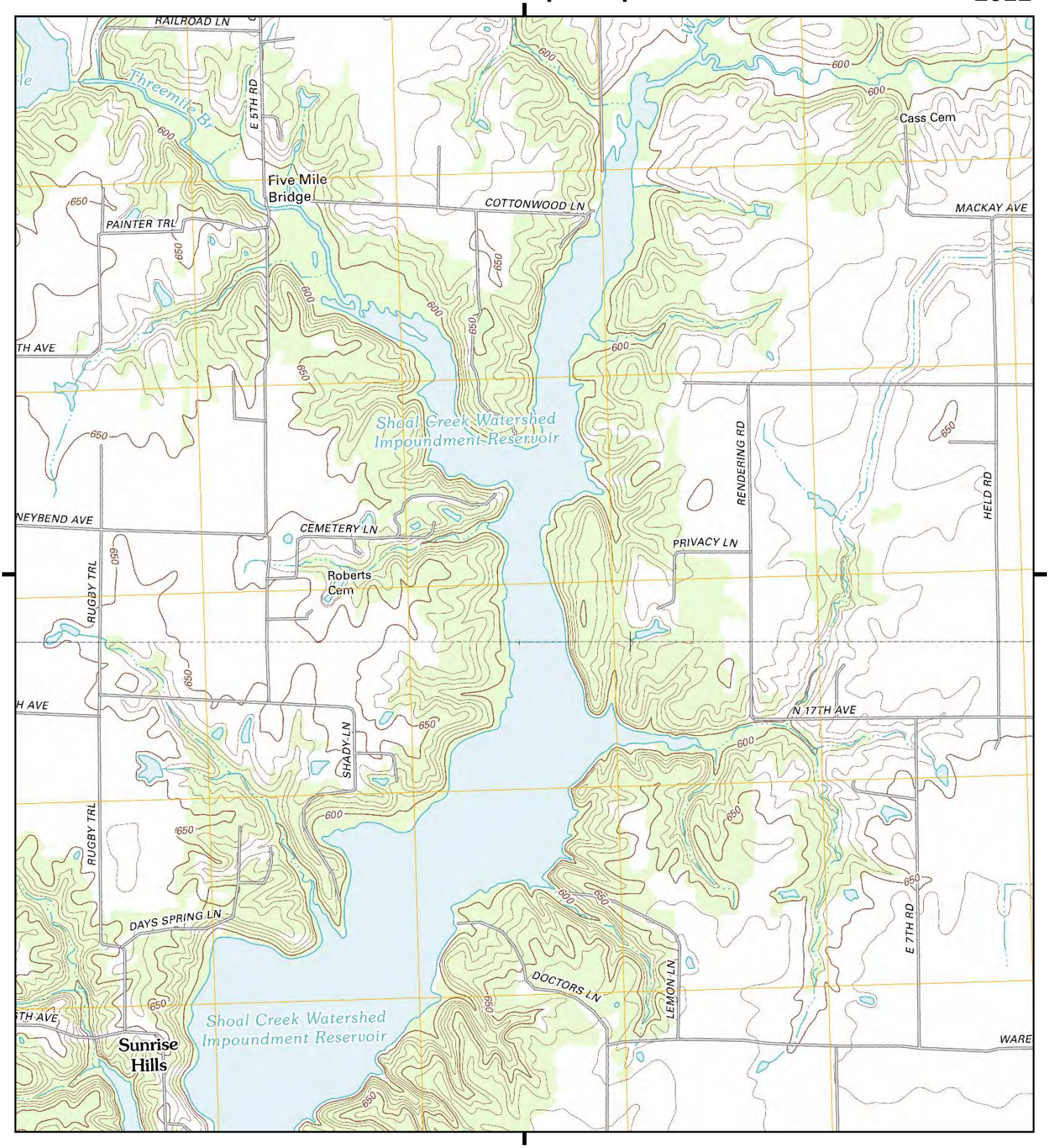
This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1923 Source Sheets

Raymond
1923
15-minute, 62500

Historical Topo Map

2012



This report includes information from the following map sheet(s).

Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Raymond, 2012, 7.5-minute

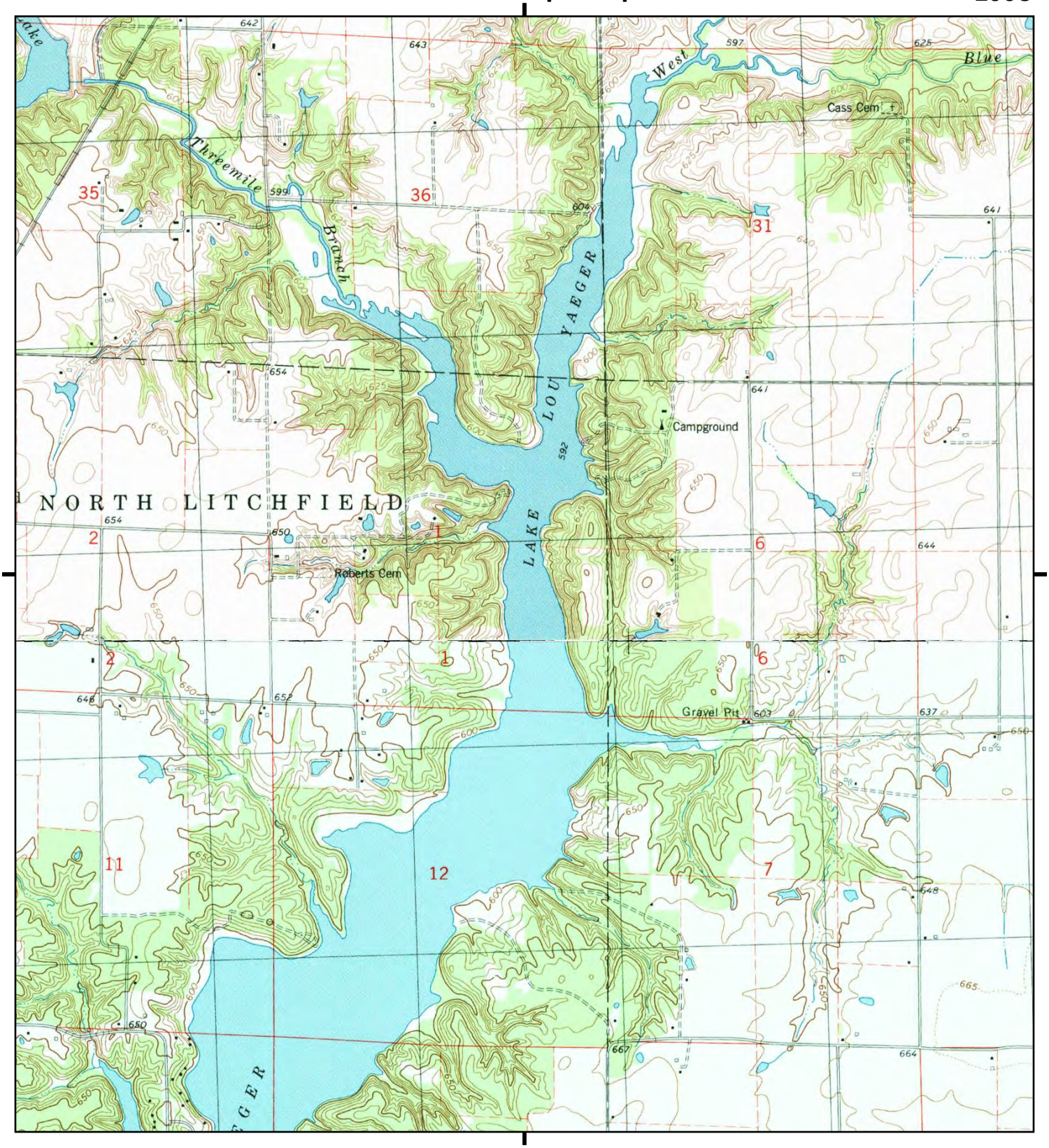
S, Butler, 2012, 7.5-minute

SITE NAME: Lake Lou Yeager
ADDRESS: Hwy 55
Butler, IL 62015
CLIENT: U.S. Army Corps of Engineers

N

Historical Topo Map

1998



This report includes information from the following map sheet(s).

Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Raymond, 1998, 7.5-minute

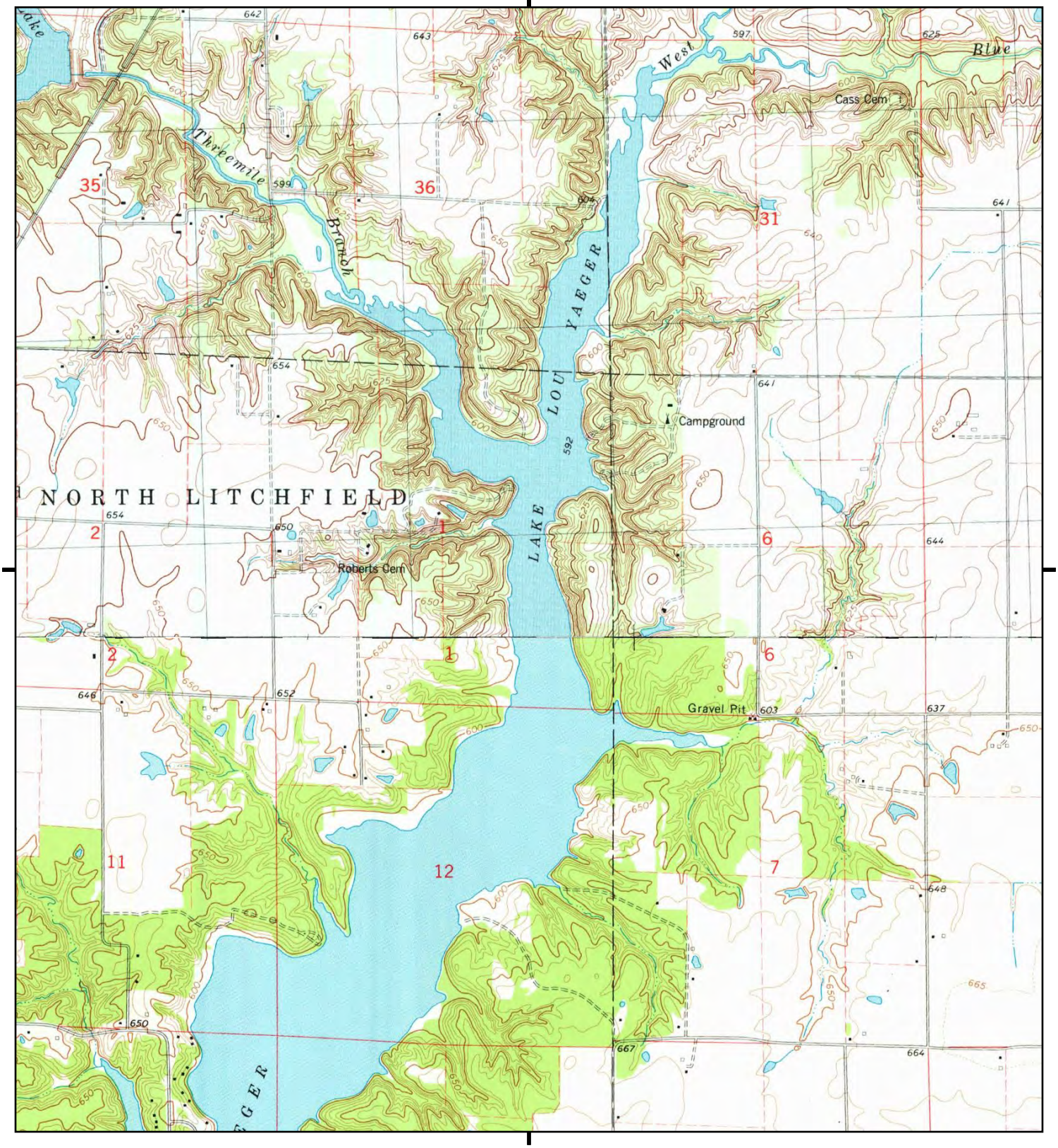
S, Butler, 1998, 7.5-minute

SITE NAME: Lake Lou Yeager
ADDRESS: Hwy 55
Butler, IL 62015
CLIENT: U.S. Army Corps of Engineers

N

Historical Topo Map

1974, 1979



This report includes information from the following map sheet(s).

Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Raymond, 1979, 7.5-minute

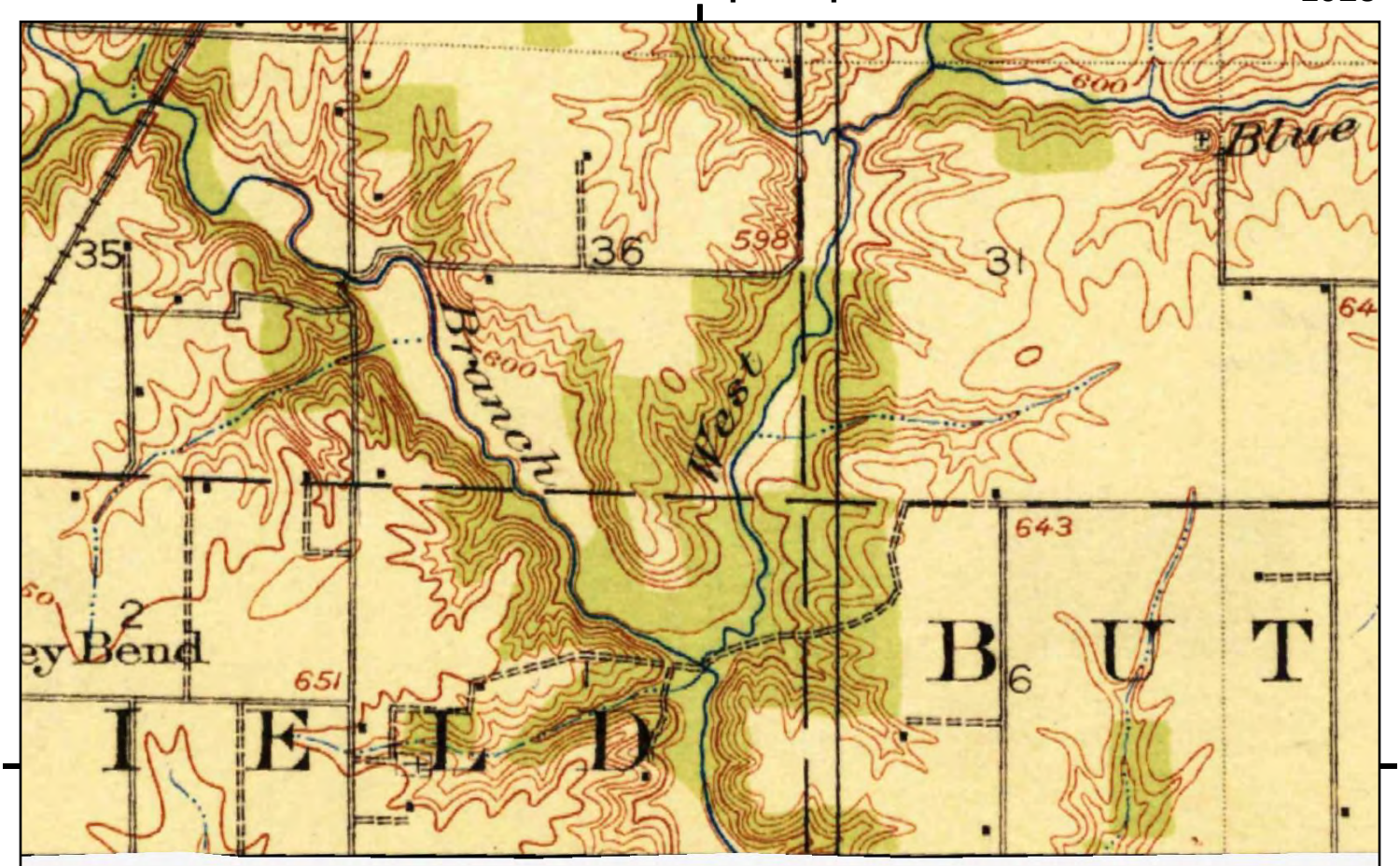
S, Butler, 1974, 7.5-minute

SITE NAME: Lake Lou Yeager
ADDRESS: Hwy 55
Butler, IL 62015
CLIENT: U.S. Army Corps of Engineers

N

Historical Topo Map

1925



This report includes information from the following map sheet(s).

Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

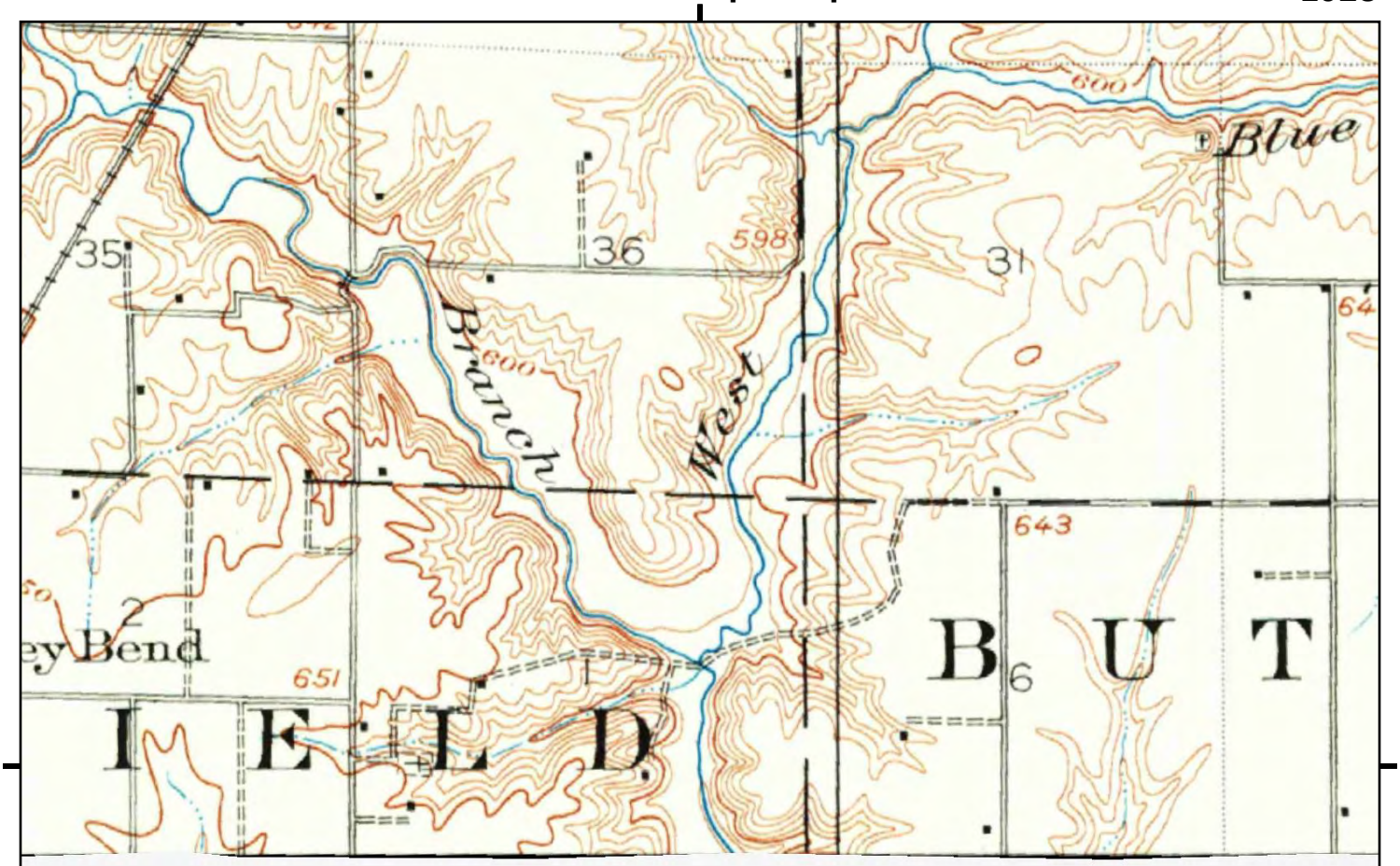
TP, Raymond, 1925, 15-minute

SITE NAME: Lake Lou Yeager
ADDRESS: Hwy 55
Butler, IL 62015
CLIENT: U.S. Army Corps of Engineers

N

Historical Topo Map

1923



This report includes information from the following map sheet(s).

Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Raymond, 1923, 15-minute

SITE NAME: Lake Lou Yeager
ADDRESS: Hwy 55
Butler, IL 62015
CLIENT: U.S. Army Corps of Engineers

N

Lake Lou Yeager
Hwy 55
Butler, IL 62015

Inquiry Number: 4552953.3
March 02, 2016

Certified Sanborn® Map Report

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

3/02/16

Site Name:
Lake Lou Yeager
Hwy 55
Butler, IL 62015

Client Name:
U.S. Army Corps of Engineers
Svc. Base,
St. Louis, MO 63118

EDR Inquiry # 4552953.3

Contact: Rick Archeski

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by U.S. Army Corps of Engineers were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Site Name: Lake Lou Yeager
Address: Hwy 55
City, State, Zip: Butler, IL 62015
Cross Street:
P.O. # NA
Project: Lake Lou Yeager
Certification # 5862-4809-AC2C

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results
Certification # 5862-4809-AC2C

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✓ Library of Congress
- ✓ University Publications of America
- ✓ EDR Private Collection

The Sanborn Library LLC Since 1866™

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Lake Lou Yeager
Hwy 55
Butler, IL 62015

Inquiry Number: 4552953.5
March 03, 2016

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	*Target Street*	*Cross Street*	*Source*
2013	☐	☑	Cole Information Services
2008	☐	☑	Cole Information Services
2003	☐	☑	Cole Information Services
1999	☐	☑	Cole Information Services
1995	☐	☐	Haines Criss-Cross Directory
1990	☐	☐	Haines Criss-Cross Directory
1985	☐	☐	Haines Criss-Cross Directory
1980	☐	☐	Haines Criss-Cross Directory

RECORD SOURCES

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FINDINGS

TARGET PROPERTY STREET

Hwy 55
Butler, IL 62015

Year	*CD Image*	*Source*	
HWY 55			
2013	-	Cole Information Services	Street not listed in Source
2008	-	Cole Information Services	Street not listed in Source
2003	-	Cole Information Services	Street not listed in Source
1999	-	Cole Information Services	Street not listed in Source
1995	-	Haines Criss-Cross Directory	Street not listed in Source
1990	-	Haines Criss-Cross Directory	Street not listed in Source
1985	-	Haines Criss-Cross Directory	Street not listed in Source
1980	-	Haines Criss-Cross Directory	Street not listed in Source

FINDINGS

CROSS STREETS

Year	*CD Image*	*Source*	
CEMETERY LN			
2013	pg. A1	Cole Information Services	
2008	pg. A2	Cole Information Services	
2003	pg. A3	Cole Information Services	
1999	pg. A4	Cole Information Services	
1995	-	Haines Criss-Cross Directory	Street not listed in Source
1990	-	Haines Criss-Cross Directory	Street not listed in Source
1985	-	Haines Criss-Cross Directory	Street not listed in Source
1980	-	Haines Criss-Cross Directory	Street not listed in Source

City Directory Images

Target Street	Cross Street	Source
-	✓	Cole Information Services

CEMETERY LN 2013

149	NOEL SETTLE
150	OCCUPANT UNKNOWN
217	CHARLES ODLE

Target Street	Cross Street	Source
-	✓	Cole Information Services

CEMETERY LN 2008

149 NOEL SETTLE
217 CHARLES ODLE

Target Street	Cross Street	Source
-	✓	Cole Information Services

CEMETERY LN 2003

149 NOEL SETTLE
150 HAROLD HARTMAN
217 C ODLE

Target Street	Cross Street	Source
-	✓	Cole Information Services

CEMETERY LN 1999

149 NOEL SETTLE

APPENDIX C
PHOTOGRAPHS

Looking northeast from Cemetery Lane at western edge of proposed berm 1A.

Looking northeast from Cemetery Lane at western edge of proposed berm 1A.

Looking southeast from Cemetery Lane at western edge of proposed berm 1A.

Looking southeast from end of Cemetery Lane toward proposed site 1 berm area in the distance.

Looking west from lake.

Looking east along Cemetery Lane.

Looking to west from east side of lake near site 1 berm.

Looking north from site 1 berm location on east side of lake.

Looking west from east side of lake near site of berm 1.

Electrical box on east side of lake near berm construction locations.

Looking north from primitive campground approximately 0.5 mile south of proposed berm area.

Looking northwest from primitive campground.

Looking south from primitive campground.

APPENDIX D
Threatened and Endangered Species

Threatened and Endangered Species (Federal)

In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, the following table is provided as an official species list identifying any federally threatened, endangered, proposed and candidate species that may occur within the boundary of the Project Area or may be affected by the proposed actions. No critical habitats within the Project Area have been identified. Some of the listed species are only found in specific habitats, which are not found in close proximity to the Project Area.

Federally listed species for the Project Area

Illinois

County Distribution of Federally Threatened, Endangered and Candidate Species

Revised September 30, 2015

Species	Status	Range	Habitat
Mammals			
Gray bat *(Myotis grisescens)*	Endangered	Alexander, Hardin, Jackson, Johnson, Monroe, Pike, Pope, Pulaski	Caves and mines; rivers & reservoirs adjacent to forests
Indiana bat *(Myotis sodalis)*	Endangered	**Potential Habitat Statewide; Known Occurrences In:** Adams, Alexander*, Bond, Clinton, Ford, Hardin*, Henderson, Jackson*, Jersey*, Johnson, LaSalle**, Lawrence, Macoupin, Madison, McDonough, Monroe*, Perry, Pike, Pope*, Pulaski, Randolph, St. Clair, Saline*, Schuyler, Scott, Union*, Vermilion, Washington *counties with hibernacula ** Blackball Mine: Designated Critical Habitat	Caves, mines (hibernacula); small stream corridors with well developed riparian woods; upland forests (foraging)

Northern long-eared bat *Myotis septentrionalis* Do I Need A Permit? Key to Interim 4(d) Rule	Threatened	Statewide	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests and woods.
Birds			
Least Tern *(Sterna antillarum*)	Endangered	Alexander, Jackson, Madison, Massac, Monroe, Pope, Randolph, St. Clair, Union, Wabash	Bare alluvial and dredged spoil islands
Piping Plover (*Charadrius melodus*)	Endangered	Cook, Lake **Migration:** Bond, Clinton, Fayette, Franklin, Jefferson, Moultrie, Shelby	Lake Michigan beaches
Piping Plover *(Charadrius melodus)*	Critical Habitat Designated	Lake	
Rufa Red knot *(Calidris canutus rufa)*	Threatened	Cook, Lake Only actions that occur along coastal areas or large wetland complexes during the red knot migratory window of May 1 - September 30	Coastal areas or large wetland complexes
Reptile			
Eastern Massasauga *(Sistrurus catenatus)*	Proposed as Threatened	Clinton, Cook, Knox, Lake, Madison, Piatt, Will	Graminoid dominated plant communities (fens, sedge meadows, peatlands, wet prairies, open woodlands, and shrublands)

Fish			
Pallid Sturgeon *(Scaphirynchus albus*)	Endangered	Alexander, Jackson, Madison, Monroe, Randolph, St. Clair, Union	Large rivers
Mussels			
Clubshell *(Pleurobema clava*)	Endangered	Vermillion	Vermillion River (North Fork)

Fanshell mussel *(Cyprogenia stegaria) (=C. irrorata)*	Endangered	White	Wabash River
Fat pocketbook pearlymussel *(Potamilis capax*)	Endangered	Gallatin, Hardin, Lawrence, Massac, Pope, Wabash, White	Mississippi, Wabash, Little Wabash, Ohio Rivers Saline, Middle Fork Saline, and North Fork Saline Rivers
Higgins eye pearlymussel *(Lampsilis higginsi*)	Endangered	Adams, Carroll, Hancock, Henderson, Jo Daviess, Mercer, Pike, Rock Island, Whiteside	Mississippi River; Rock River to Steel Dam
Orangefoot pimpleback *(Plethobasus cooperianus)*	Endangered	Massac, Pulaski	Ohio River below confluence with Cumberland River
Pink Mucket pearlymussel *(Lampsilis abrupta)*	Endangered	Massac	Ohio River
Rabbitsfoot (*Quadrula cylindrica cylindrica*)	Threatened	Alexander, Clark, Crawford, Jasper, Lawrence, Massac, Pulaski, Vermilion, Wabash, White	Embarrass, North Fork Vermilion, Vermilion, Ohio, and Wabash Rivers
Rabbitsfoot (*Quadrula cylindrica cylindrica*)	Critical Habitat	Massac, Pulaski, and Vermilion	Ohio River, North Fork Vermilion, Vermilion, Maps of Critical Habitat
Scaleshell *(Leptodea leptodon)*	Endangered	Grundy	Illinois River, Marseilles Pool
Sheepnose mussel (*Plethobasus cyphyus*)	Endangered	Alexander, Hancock, Kankakee, Massac, Pulaski, Rock Island, Whiteside, Will	Shallow areas in larger rivers and streams
Snuffbox (*Epioblasma triquetra*)	Endangered	Coles, Cumberland, Douglas	Small to medium-sized creeks in areas with a swift current and some larger rivers
Spectaclecase mussel (*Cumberlandia monodonta*)	Endangered	Hancock, Henderson, Madison, Massac, Pike, Rock Island	Large rivers in areas sheltered from the main force of the current
Snails			
Iowa pleistocene snail *(Discus macclintocki)*	Endangered	Jo Daviess	North-facing algific talus slopes of the driftless area

Insects			
Hine's emerald dragonfly *(Somatochlora hineana*)	Endangered	Cook, Dupage, Will (Des Plaines River drainage)	Spring fed wetlands, wet meadows and marshes

Hine's emerald dragonfly *(Somatochlora hineana*)	Critical Habitat Designated	Cook, DuPage, and Will Go here for a map and written description of the areas designated as Critical Habitat (PDF)	
Karner blue butterfly *(Lycaeides melissa samuelis)*	Endangered	Lake	Pine barrens and oak savannas on sandy soils and containing wild lupines (*Lupinus perennis)*, the only known food plant of the larvae
Rattlesnake-master borer moth *(Papaipema eryngii)*	Candidate	Cook, Effingham, Fayette, Grundy, Kankakee, Livingston, Marion, Will	Undisturbed prairie and woodland openings that contain their only food plant, rattlesnake-master (*Eryngium yuccifolium*).
Crustacean			
Illinois cave amphipod *(Gammarus acherondytes)*	Endangered	Monroe, St. Clair	Cave streams in Illinois sinkhole plain
Plants			
Decurrent false aster *(Boltonia decurrens*)	Threatened	Brown, Bureau, Calhoun, Cass, Fulton, Greene, Jersey, LaSalle, Madison, Marshall, Mason, Morgan, Peoria, Pike, Putnam, St. Clair, Schuyler, Scott, Tazewell, Woodford	Disturbed alluvial soils

Eastern prairie fringed orchid *(Platanthera leucophaea)*	Threatened	Adams, Bond, Boone, Brown, Bureau, Calhoun, Caroll, Cass, Champaign, Christian, Clark, Clay, Clinton, Coles, Cook, Crawford, Cumberland, Dekalb, DeWitt, Douglas, DuPage, Edgar, Effingham, Fayette, Ford, Fulton, Green, Grundy, Hancock, Henderson, Henry, Iroquois, Jasper, Jersey, Jo Davies, Kane, Kankakee, Kendall, Knox, Lake, LaSalle, Lawrence, Lee, Livingston, Logan, Macon, Macoupin, Madison, Marion, Marshall, Mason, McDonough, McHenry, McLean, Menard, Mercer, Montgomery, Morgan, Moultrie, Ogle, Peoria, Piatt, Pike, Putnam, Richland, Rock Island, Saint Clair, Sangamon, Schutler, Scott, Shelby, Stark, Stephenson, Tazewell, Vermillion, Wabash, Warren Washington, Whiteside, Will, Winnebago, Woodford	Mesic to wet prairies
Lakeside daisy *(Hymenopsis herbacea)*	Threatened	Tazewell, Will	Dry rocky prairies
Leafy prairie clover *(Dalea foliosa)*	Endangered	Boone, Dupage, Kane, Kankakee, LaSalle, Madison,Ogle, Will, Winnebago	Prairie remnants on thin soil over limestone
Mead's milkweed *(Asclepias meadii)*	Threatened	Dupage, Henry, Saline, Vermillion, Will	Virgin prairies
Pitcher's thistle *(Cirsium pitcheri)*	Threatened	Lake	Lakeshore dunes
Prairie bush clover *(Lespedeza leptostachya)*	Threatened	Cass, Champaign, Cook, Dupage, Jo Daviess, Ogle, Lee, McHenry, Winnebago	Dry to mesic prairies with gravelly soil

Price's potato bean *(Apios priceana*)	Threatened	Extirpated	Wet floodplain forests, shrubby swamps
Small whorled pogonia *(Isotria medeoloides)*	Threatened	Randolph	Dry woodlands

APPENDIX E
Clean Water Act

Section 303(d) of the Clean Water Act requires that each state identify waters not meeting water quality standards related to beneficial uses of water including whole body contact (e.g., swimming), support aquatic life, and provide drinking water for people, livestock, and wildlife.

Waters identified in the Integrated Water Quality Report in accordance with CWA Section 303(d) are deemed impaired for specific chemical constituents and consequently additional loadings (i.e., discharges) of those constituents may be restricted. In addition to possible restrictions on future loadings to these listed waterbodies, waters identified in accordance with CWA Section 303(d) are subject to the development of Total Maximum Daily Loads (TMDLs). TMDLs in Illinois may take the form of a watershed study in which the chemical constituent causing impairment to that waterbody is evaluated. A TMDL is the sum of the allowable amount of a single pollutant that a waterbody can receive from all contributing sources and still meet water quality standards and designated uses.

Impaired Waters of Illinois
Draft 2016 Integrated Water Quality Report

Order	Priority	Hydrologic Unit Code	Water Name	Assessment ID	Designated Use	Cause
221	High	0714020301	Lou Yaeger	IL_RON	Fish Consumption	Mercury
222	High	0714020301	Lou Yaeger	IL_RON	Aesthetic Quality	Total Suspended Solids (TSS)
2757	Low	0714020301	Lou Yaeger	IL_RON	Aesthetic Quality	Phosphorus (Total)
219	High	0714020301	West Fork Shoal Creek	IL_OIM-02	Aquatic Life	Dissolved Oxygen
220	High	0714020301	West Fork Shoal Creek	IL_OIM-02	Aquatic Life	Water Temperature

APPENDIX F
National Response Center (NRC) Report

SEQNOS	DESCRIPTION OF INCIDENT	TYPE OF INCIDENT	INCIDENT CAUSE	INCIDENT DATE TIME	INCIDENT LOCATION	LOCATION ADDRESS	LOCATION NEAREST CITY	LOCATION STATE	LOCATION COUNTY
1016254	CALLER REPORTED THAT 1 QUART OF DIESEL FUEL DISCHARGED ONTO THE RUNNING BOARD OF THE ENGINE DUE TO A DISCONNECTED FUEL LINE.	RAILROAD	EQUIPMENT FAILURE	6/29/2012 21:12	MILE POST TS395		COFFEEN	IL	MONTGOMERY
1020710	CALLER REPORTED A LOCOMOTIVE THAT CAUGHT ON FIRE AND SPILLED OIL ONTO THE ENGINE WALKWAY.	RAILROAD	EQUIPMENT FAILURE	8/11/2012 1:00		MP D432.5	HONEY BEND	IL	MONTGOMERY
1031237	THE CALLER IS REPORTING A RELEASE OF SINAZINE (4 L) INTO A LOCAL CREEK. THE CALLER STATED THAT A VEHICLE ACCIDENT LEAD TO THE SPILL. THE CALLER STATED THAT A PICK UP TRUCK WAS CARRYING	STORAGE TANK	OTHER	11/21/2012 6:00		IRVING RD. & 17TH ST.	IRVING	IL	MONTGOMERY

	A 250 GALLON TOTE CONTAINING THE MATERIAL. NO INJURIES REPORTED AT THIS TIME.								
1064178	CALLER REPORTED THAT A TRAIN FATALLY STRUCK A TRESPASSER.	RAILROAD NON-RELEASE	TRESPASSER	10/27/2013 18:27		SPRUCE STREET AND FRONT	IRVING	IL	MONTGOMERY
1100854	CALLER IS REPORTING THAT A VALVE CAME OFF OF AN ANHYDROUS AMMONIA WAGON CAUSING A RELEASE OF APPROXIMATELY 350 POUNDS OF ANHYDROUS AMMONIA.	MOBILE	EQUIPMENT FAILURE	11/12/2014 11:05		GRAIN LEG & 5TH AVE	FARMERSVILLE	IL	MONTGOMERY
1101371	CALLER STATED 12 CARS DE-RAILED YESTERDAY, WITH SOME CARS UPRIGHT AND AT LEAST ONE CAR ON ITS SIDE DUE TO UNKNOWN	RAILROAD	DERAILMENT	11/17/2014 9:40	MAIN LINE	MP: D439	BROWNING	IL	MONTGOMERY

	CAUSES. WHILE RE-RAILING THE CAR TODAY (18NOV14), 400 POUNDS OF COAL RELEASED FROM THE BOTTOM OF THE CAR TO THE BALLAST.								
1109022	CALLER STATED THAT THERE WAS A RELEASE OF TURBINE OIL FROM GENERATING UNIT NUMBER 1 DUE TO AN EQUIPMENT FAILURE. 800-1000 GALLONS DID IMPACT COFFEEN LAKE.	FIXED	EQUIPMENT FAILURE	2/25/2015 9:25		134 CIPS LANE	COFFEEN	IL	MONTGOMERY
1126595	CALLER STATED TURBAN OIL RELEASED FROM A TURBAN OIL COOLER INTO COFFEEN LAKE DUE TO MECHANICAL ISSUES.	FIXED	EQUIPMENT FAILURE	8/24/2015 22:30	COFFEEN POWER STATION		COFFEEN	IL	MONTGOMERY
1129723	CALLER IS REPORTING A RELEASE OF ANHYDROUS AMMONIA FROM A FAILED ISOLATION VALVE.	FIXED	EQUIPMENT FAILURE	9/30/2015 0:15		134 CIPS LANE	COFFEEN	IL	MONTGOMERY

1130090	TRESPASSER FATALITY INVOLVED WITH A FREIGHT TRAIN AT A GRADE CROSSING.	RAILROAD NON-RELEASE	TRESPASSER	10/4/2015 20:04		MILLER BRANCH TRAIL	HILLSBOROUGH	IL	MONTGOMERY
1132567	CALLER STATED THAT A HOSE BROKE ON THE WAGON APPLYING AMMONIA TO THE FIELD WHICH CAUSED A RELEASE OF MATERIALS TO THE ATMOSPHERE.	MOBILE	EQUIPMENT FAILURE	11/4/2015 13:30		GOLBY AVENUE	WAGNER	IL	MONTGOMERY
1135481	*** CONTINUOUS RELEASE REPORT *** * STATISTICALLY SIGNIFICANT INCREASE ANHYDROUS AMMONIA IS RELEASING FROM THE POWER STACK. (DATE AND TIME IS INACCURATE)	CONTINUOUS	OTHER	12/10/2015 0:00		134 CIPS LANE	COFFEEN	IL	MONTGOMERY
1135605	CALLER STATED A FREIGHT TRAIN STRUCK A SUBJECT ON THE MAIN LINE. CALLER STATED IF WAS	RAILROAD NON-RELEASE	TRESPASSER	12/12/2015 1:35		MP 217.98	NOKOMIN	IL	MONTGOMERY

	CONFIRMED AS A FATALITY AT 0135 HOURS.								
894110	DOWANOL (A GLYCOL PRODUCT) , BUTYL CARBINOL, AND PRIMARY AMYL ALCOHOL HAVE SPILLED ONTO THE SOIL FROM A TANKER TRUCK INVOLVED IN A TRAFFIC ACCIDENT.	MOBILE	TRANSPORT ACCIDENT	1/6/2009 9:00		I-55 MILE MARKER 67	WAGGONERS	IL	MONTGOMERY
895722	CALLER IS REPORTING THAT A VESSEL RUBBED AGAINST THE RIGHT DESCENDING BANK OF THE RIVER CREATING A HOLE IN THE HULL. THIS CREATES A POTENTIAL RELEASE OF MATERIAL LUBE OIL.	VESSEL	TRANSPORT ACCIDENT	1/23/2009 21:00	UPPER MISSIPPI RIVER	MILE MARKER 162.0	COLUMBIA	IL	MONTGOMERY

925420	CALLER STATED THAT THERE WAS A TRESPASSER THAT WAS RIDING AN ALL TERRAIN VEHICLE ALONG THE RAILROAD TRACKS AND IT LOST CONTROL AND ROLLED ON TOP OF THE PERSON RESULTING IN ONE FATALITY.	MOBILE	OPERATOR ERROR	12/6/2009 14:36	MAIN STREET, MILE POST 217.5 AND SUBDIVISON GILMAN			IL	MONTGOMERY
861847	CALLER STATED THERE WAS A TWENTY ONE CAR FREIGHT TRAIN DERAILMENT WITH A POTENTIAL RELEASE OF MATERIALS. NO RELEASE OF MATERIALS REPORTED, NO INJURES.	RAILROAD	DERAILMENT	2/8/2008 9:30		COUNTY HWY 21 AND	WALSHVILLE	IL	MONTGOMERY
871184	THE CALLER IS REPORTING A RELEASE OF MATERIAL ONTO THE GROUND DUE TO AN OPEN DOOR.	RAILROAD	UNKNOWN	5/16/2008 17:10		MILE POST D-424	HARVEL	IL	MONTGOMERY

874713	NINE COAL CARS HAVE DERAILED ON THE BNSF MAIN LINE. THE CAUSE OF THE DERAILMENT IS UNDER INVESTIGATION.	RAILROAD NON-RELEASE	DERAILMENT	6/19/2008 16:15	BNSF RAILROAD		TOLAND	IL	MONTGOMERY
875892	CALLER IS REPORTING A RELEASE OF K061 ARC DUST FROM A STEEL MILL (HAZARDOUS WASTE SOLID). THE DRIVER WAS OVERWEIGHT ON HIS AXLE AND WHEN THE SCALE MASTER TOLD HIM TO RAISE THE DUMP TRAILER TO SLIDE THE LOAD TO THE BACK WHICH CAUSED THE MATERIAL TO RELEASE FROM THE TRAILER. THE RELEASE WENT ONTO THE CONCRETE AND GRAVEL.	MOBILE	OPERATOR ERROR	6/30/2008 17:30		I55 NORTHBOUND TRUCK SCALES	LICHFIELD	IL	MONTGOMERY

878575	CALLER IS REPORTING THAT POWDER LIME STONE RELEASED FROM A RAILCAR ON TRAIN 349N DUE TO UNKNOWN CAUSES. AS A RESULT THE MATERIAL RELEASED ONTO THE BALLAST.	RAILROAD	UNKNOWN	7/26/2008 15:40	MAIN LINE, MILE POST D 439.1		BROWNING	IL	MONTGOMERY
828810	THE CALLER STATED THAT A HOPPER DOOR ON A RAIL CAR CAME OPEN WHILE A TRAIN WAS IN MOTION CAUSING A RELEASE OF BULK LIMESTONE ONTO THE BALLAST AND GROUND.	RAILROAD	OTHER	3/11/2007 7:00	MILE POST D468		LITCHFIELD	IL	MONTGOMERY
840586	CALLER IS REPORTING A DISCHARGE OF COPPER SULFATE INTO A SELF CONTAINED POND ON THEIR FACILITY. THE MATERIALS WAS DUMPED INTO THE POND TO CONTROL ALGAE.	FIXED	DUMPING	7/1/2007 9:30		725 SOUTH MCKINNY DRIVE	LITCHFIELD	IL	MONTGOMERY

840944	CALLER REPORTED THAT COPPER SULFATE WAS PUT INTO AN ENCLOSED POND AT THE FACILITY TO KILL THE ALGAE.	FIXED	OTHER	7/4/2007 9:00		725 SOUTH MCKINNY DRIVE	LITCHFIELD	IL	MONTGOMERY
842748	THE CALLER IS REPORTING A RELEASE OF MATERIALS ONTO THE GROUND AND INTO A STORM SEAWARE FROM TRANSFORMER DUE TO EQUIPMENT FAILURE.	FIXED	EQUIPMENT FAILURE	7/19/2007 20:30		2001 ALLCUT	MONTGOMERY	IL	MONTGOMERY
851871	CALLER IS REPORTING THAT THE QUARRY IS GRINDING UP LIME STONE AND IT IS DISCHARGING DUST CLOUDS INTO THE AIR AND IT IS FALLING ONTO THE FARMLAND.	FIXED	OPERATOR ERROR	10/17/2007 13:50	2 MILES NORTH OF NAKOMIS, IL	23311 TAYLORVILLE ROAD	NAKOMIS	IL	MONTGOMERY

816181	CALLER IS REPORTING A GRADE CROSSING ACCIDENT INVOLVING A FREIGHT TRAIN AND AUTOMOBILE (LONE VEHICLE OCCUPANT). CALLER DOES NOT KNOW THE EXACT TYPE OF AUTOMOBILE INVOLVED IN THE ACCIDENT. DRIVER FATALITY AS A RESULT OF THE ACCIDENT.	RAILROAD NON-RELEASE	TRANSPORT ACCIDENT	10/26/2006 20:33	MILEPOST 230	GRAND POINT AVE.	HILLSBORO	IL	MONTGOMERY

APPENDIX G
Questionnaire

From: Chris Hawn <CHawn@cityoflitchfieldil.com>
Sent: Thursday, May 26, 2016 7:11 AM
To: Archeski, Richard D MVS
Subject: [EXTERNAL] RE: Lake Questions

1. No
2. Fuel Pump, No, No, Fuel
3. Yes, Approximately 200 yards, No, No, Fuel
4. Yes, Possible PCBs, Don't know how many or locations
5. No
6. No

Please let me know if you have any other questions.

-----Original Message-----
From: Archeski, Richard D MVS [mailto:Richard.D.Archeski@usace.army.mil]
Sent: Wednesday, May 25, 2016 11:31 AM
To: Chris Hawn <CHawn@cityoflitchfieldil.com>
Subject: Lake Questions

Chris, I am with the Army Corps of Engineers in the St. Louis District. We are conducting a Phase I
Environmental Survey for Lake Lou Yaeger in preparation for a project. I would appreciate if you could
answer a couple of questions.

1. To your knowledge have there ever been any spills at or in the lake?
   If so, how long ago?
   What was spilled and how much (quantity)?

2. Have there been any or are there any underground storage tanks (USTs) near the lake?
   Did they leak?
   Have they been removed?
   What was/is their content (material stored)?

3. Have there been any or are there any aboveground storage tanks (ASTs) near the lake?
   Did they leak?
   Have they been removed?
   What was/is their content (material stored)?

4. Are there any transformers, capacitors, or any hydraulic equipment which have PCB's in the
lake area?
   If so, how many and where are they located.

5. Any landfills located near the lake?
   If so, please provide location(s).

6. Any industrial facilities located next to lake?
   If so, what type (foundry, auto shop, cleaners, etc.).

Please call me if you have any questions.

Thanks
Rick Archeski
Environmental Engineer
USACE- St. Louis District
314-865-6307

From: David Sumpter <DSumpter@cityoflitchfieldil.com>
Sent: Saturday, May 28, 2016 10:31 AM
To: Archeski, Richard D MVS
Subject: [EXTERNAL] RE: Emergency Response
Attachments: Dave Sumpter.vcf

I have been with the Litchfield Fire Department for 36 years, plus spent a lot of time around the lake in
my childhood. My answers are to the best of my recollection.

-----Original Message-----
From: Archeski, Richard D MVS [mailto:Richard.D.Archeski@usace.army.mil]
Sent: Wednesday, May 25, 2016 11:29 AM
To: David Sumpter <DSumpter@cityoflitchfieldil.com>
Subject: Emergency Response

Dave, I am with the Army Corps of Engineers in the St. Louis District. We are conducting a Phase
I Environmental Survey for Lake Lou Yaeger in preparation for a project. I would appreciate if you could
answer a couple of questions.

1. To your knowledge have there ever been any spills at or in the lake?
   If so, how long ago?
   What was spilled and how much (quantity)? No.

2. Have there been any or are there any underground storage tanks (USTs) near the lake?
   Did they leak?
   Have they been removed?

What was/is their content (material stored)? I know of one (1) underground tank at
Marina #1 containing Regular gasoline. I do not know of any leaks.

3. Have there been any or are there any aboveground storage tanks (ASTs) near the lake?
Did they leak?
Have they been removed?
What was/is their content (material stored)? I am sure there are above ground tanks at
some of the local farms, but we have never been called in regards to any leaks.

4. Are there any transformers, capacitors, or any hydraulic equipment which have PCB's in the
lake area? No
If so, how many and where are they located.

5. Any landfills located near the lake? No
If so, please provide location(s).

6. Any industrial facilities located next to lake?
If so, what type (foundry, auto shop, cleaners, etc.). No, there is cove named in regard
to an old Rendering plant in the area, but I don't think it has been in operation for at least 50 years.

Please call me if you have any questions.

I believe that in regard to Haz-Mat the lake hasn't been placed at risk from any incidents that I recall.
Agriculture type chemicals would be the only source of pollutants that I know of, and not from any
particular incident, but normal agriculture activities. Feel free to contact the fire department if you have
any other questions.

Thanks
Rick Archeski
Environmental Engineer
USACE- St. Louis District
314-865-6307

Appendix H

MONITORING AND ADAPTIVE MANAGEMENT

Monitoring and Adaptive Management Appendix H

1. Introduction

Section 2039 of WRDA 2007 requires that when conducting a feasibility study for ecosystem restoration, the proposed project includes a plan for monitoring the success of the ecosystem restoration. Additionally, paragraph (3)(d) of Section 2039 states that "an adaptive management plan will be developed for ecosystem restoration projects…appropriately scoped to the scale of the project." The implementation guidance for Section 2039, in the form of a CECW-PB Memo dated 31 August 2009, also requires that an adaptive management plan be developed for all ecosystem restoration projects. Adaptive management "prescribes a process wherein management actions can be changed in response to monitored system response, so as to maximize restoration efficacy or achieve a desired ecological state" (Fischenich et al. 2012).

The adaptive management plan for the Lake Lou Yaeger, IL, Section 206 project describes and justifies whether adaptive management is needed in relation to the proposed project management alternatives identified in the project feasibility study. This appendix outlines how the results of the project-specific monitoring plan would be used to adaptively manage the project, including monitoring targets which demonstrate project success in meeting project objectives. The USACE intent was to develop monitoring and adaptive management actions appropriate for the project's goal and objectives.

Adaptive management provides a process for making decisions in the face of uncertainty. The primary incentive for implementing an adaptive management plan is to increase the likelihood of achieving desired project outcomes given the identified uncertainties, which can include incomplete description and understanding of relevant ecosystem structure and function; imprecise relationships among project management actions and corresponding outcomes; engineering challenges in implementing project alternatives; and ambiguous management and decision-making processes.

The study team determined that uncertainties surrounding the success of the project are primarily linked to the following: 1) successful establishment of desirable aquatic vegetation in the wetland area, and 2) possible higher than estimated sedimentation rates in the wetland area.

2. Goals and Objectives

The primary goal of the Lake Lou Yaeger, IL, Section 206 project is to restore, to the extent practical, quality, functional wetlands and habitat for aquatic organisms in Lake Lou Yaeger. Implementation of the recommended plan would result in the restoration of emergent wetland upstream of the berm and also restore habitat for aquatic species downstream of the berm.

The following objectives and proposed restoration features were considered during the study to achieve the project goal:

1) *Restore herbaceous emergent wetlands* – Construct a berm to retain sediment and allow wetland vegetation to naturally establish over time as water depths decrease.
2) *Improve habitat for aquatic organisms* – Construction of the berm will reduce the amount of sediment deposited downstream of the berm, thereby reducing the rate of habitat loss for aquatic organisms.

3. Performance Indicators

Performance indicators to the above objectives were developed with the best available knowledge. They were developed to be specific, measurable, attainable, realistic, and timely. Because the two areas of greatest risk and uncertainty are related to the goal of wetland restoration, and because the achievement of

the second goal is dependent on the success of the wetland restoration, USACE is only proposing monitoring and adaptive management related to wetland restoration.

Vegetation Monitoring

1) **Performance Indicators:** Species composition and quality of annual or perennial herbaceous vegetation.
2) **Rationale:** This survey will be conducted to evaluate effectiveness of restoration features to successfully establish a diverse wetland habitat while keeping invasive species at a tolerable level.
3) **Methodology:** For the first five years, herbaceous vegetation surveys will be conducted by the Sponsor once each year within the restored emergent herbaceous wetland areas. Surveys will be conducted between August 1st and September 15th. Prior to the end of the construction phase, 20 (50 × 50 cm) plots will be randomly located above the berm. GPS points will be recorded for each plot and subsequent monitoring will be done at the same coordinates. Percent cover of each plant species will be visually estimated for all plants within the plot. Species will be classified as native, non-native (invasive), and/or woody. For each year two average percent cover (all plots both samples) values will be provided: a total plant percent cover value and a native emergent herbaceous wetland percent cover value. These values will be used to determine success. If ecological success targets are not being achieved at year two, then adaptive management will be considered.
4) **Monitoring Targets (Desired Outcomes):** With the restoration of native wetland communities, the targets for species composition and quality include the following:
    a. Native wetland herbaceous species ≥ 75%
    b. Percentage of invasive species < 25%.
5) **Action Criteria (Adaptive Management triggers):** Adaptive management actions should be implemented if any of the below action criteria are triggered. Adaptive management could include, but is not limited to, planting native wetland species, removing invasive species, and/or modifying the berm. The exact management action implemented will be decided by USACE.
    a. Native wetland herbaceous species ≤ 75%
    b. Percentage of invasive species > 25%.

Performance indicators are summarized in Table 1. The conceptual monitoring schedule and estimated costs are provided in Table 2.

Table 1. Project objectives, indicators, and time before the effects of the Lake Lou Yaeger, IL Section 206 project become apparent

Objective	Performance Indicator	Monitoring Target (Desired Outcome)	Action Criteria (AM triggers)	Time of Effect	Responsible Party
Restore herbaceous emergent wetlands	Species composition and quality of annual and perennial herbaceous vegetation	Native wetland herbaceous species ≥ 75% Percentage of invasive species < 25%.	Apply adaptive management actions if any of the monitoring targets fall outside the desired thresholds	5- years post-construction	Sponsor/ USACE

Table 2. Lake Lou Yaeger, IL, Section 206 project conceptual monitoring schedule and estimated monitoring costs. Construction completion is set at year 0.

Performance Indicator	0	+1	+2	+3	+4	+5
Plant Species Diversity*	Construction	X	X	X	X	X
Est. Cost ($)		$1,000	$1,000	$1,000	$1,000	$1,000
SUBTOTAL	**$5,000**					

*These data will be collected annually by the Sponsor and visually confirmed by USACE during a site visit.

4. Data Management Plan

The data management plan has been developed to support the monitoring and adaptive management plan. The surveys will be documented in an annual written report that will be provided by the Sponsor to USACE for review by the end of the calendar year. The report will include:

- A figure showing the location of all sample plots
- GPS coordinates for all sample plots
- Day, month, and year monitoring was performed
- Name(s) of company/individuals conducting the monitoring
- Herbaceous species and percent cover for each species listed by sample plot
- Classification (native, non-native, woody, wetland, non-wetland) of herbaceous species by plot

5. Adaptive Management Plan

In the event that USACE determines that ecological success is not likely to be met using information provided in the monitoring reports, the following adaptive management measures could be implemented to aid the achievement of ecological success.

If native herbaceous plants do not constitute 75% of the total plant percent cover then adaptive management measures may be necessary. If species survivorship is low, then live plant plugs of native herbaceous wetland species suitable for the area's hydrology should be planted. If the hydrology fails, modification of the berm could be conducted to restore the hydrology.

If invasive encroachment exceeds 25% of percent land cover, measures will be taken to remove invasive species. Common invasive species to be monitored for include Johnsongrass (*Sorghum halepense*), Reed Canary Grass (*Phalaris arundinacea*), Kudzu (*Pueraria* spp.), Japanese Hops (*Humulus japonicus*), and Common Reed (*Phragmites australis*). Common management techniques include burning, hand removal, and herbicide application. Management techniques would be implemented until percent cover of invasive plants is reduced to less than 25%.

Table 3 below outlines the estimated timing and cost of potential adaptive management measures. The timing and costs may be adjusted based on the monitoring results. If implementation of adaptive management measures occur in years 3, 4 or 5, then annual monitoring as described above will be continued for an additional 3 years following the adaptive management action. Ecological success will be

evaluated and additional adaptive management and subsequent monitoring cycle could be conducted. This process will continue until success is determined.

Table 3. Lake Lou Yaeger, IL, Section 206 project conceptual adaptive management schedule and estimated costs. Construction completion is set at year 0.

Management Measure	0	+1	+2	+3	+4	+5
Plantings	Construction	N/A	$2,500	N/A	N/A	N/A
Invasives Management		N/A	$2,500	N/A	N/A	N/A
Berm Modification		N/A	$15,000	N/A	N/A	N/A
Total	**$20,000**					