Shoreline Management Plan Revision and Master Plan Supplement

Environmental Impact Statement

Resource Categories Not Affected

Eufaula Lake, Oklahoma

United States Army
Corps of Engineers
Tulsa District

November 2012

CDM Smith

Contents

Acronyms ..... **vii**

Section 1 Introduction **1-1**

Section 2 Affected Environment **2-1**

2.1 Agricultural Lands 2-1
- 2.1.1 Area of Analysis (Agricultural Lands) 2-1
- 2.1.2 Regulatory Setting (Agricultural Lands) 2-1
- 2.1.3 Existing Conditions (Agricultural Lands) 2-3

2.2 Air Quality 2-9
- 2.2.1 Area of Analysis (Air Quality) 2-9
- 2.2.2 Regulatory Setting (Air Quality) 2-9
- 2.2.3 Existing Conditions (Air Quality) 2-11

2.3 Climate Change and Greenhouse Gas Emissions 2-12
- 2.3.1 Background 2-12
- 2.3.2 Area of Analysis (Climate Change and GHG) 2-13
- 2.3.3 Regulatory Setting (Climate Change and GHG) 2-13
- 2.3.4 Existing Conditions (Climate Change and GHG) 2-14

2.4 Water Supply, Flood Storage, and Operations 2-17
- 2.4.1 Area of Analysis (Water Supply, Flood Storage, and Operations) 2-17
- 2.4.2 Regulatory Setting (Water Supply, Flood Storage, and Operations) 2-17
- 2.4.3 Existing Conditions (Water Supply, Flood Storage, and Operations) 2-18

2.5 Hazardous Materials 2-20
- 2.5.1 Area of Analysis (Hazardous Materials) 2-20
- 2.5.2 Regulatory Setting (Hazardous Materials) 2-20
- 2.5.3 Existing Conditions (Hazardous Materials) 2-21

2.6 Navigation 2-24
- 2.6.1 Area of Analysis (Navigation) 2-24
- 2.6.2 Regulatory Setting (Navigation) 2-24
- 2.6.3 Existing Conditions (Navigation) 2-24

2.7 Energy 2-25
- 2.7.1 Area of Analysis (Energy) 2-25
- 2.7.2 Regulatory Setting (Energy) 2-25
- 2.7.3 Existing Conditions (Energy) 2-26

2.8 Land Use Compatibility 2-29
- 2.8.1 Area of Analysis (Land Use Compatibility) 2-29
- 2.8.2 Regulatory Setting (Land Use Compatibility) 2-30
- 2.8.3 Existing Conditions (Land Use Compatibility) 2-30

2.9 Public Infrastructure and Utilities 2-31
- 2.9.1 Area of Analysis (Public Infrastructure and Utilities) 2-31
- 2.9.2 Regulatory Setting (Public Infrastructure and Utilities) 2-31
- 2.9.3 Existing Conditions (Public Infrastructure and Utilities) 2-32

2.10 Social Services and Community Facilities 2-39
2.10.1 Area of Analysis (Social Services and Community Facilities) 2-39
2.10.2 Regulatory Setting (Social Services and Community Facilities) 2-39
2.10.3 Existing Conditions (Social Services and Community Facilities) 2-39
2.11 Environmental Justice 2-48
2.11.1 Area of Analysis (Environmental Justice) 2-48
2.11.2 Regulatory Setting (Environmental Justice) 2-48
2.11.3 Existing Conditions (Environmental Justice) 2-48

Section 3 Environmental Consequences 3-1

3.1 Agricultural Lands 3-1
3.1.1 Assessment Methods (Agricultural Lands) 3-1
3.1.2 Significance Criteria (Agricultural Lands) 3-2
3.1.3 No Action Alternative (Agricultural Lands) 3-2
3.1.4 Alternative 1 (Agricultural Lands) 3-3
3.1.5 Alternative 2 (Agricultural Lands) 3-4
3.1.6 Alternative 3 (Agricultural Lands) 3-6
3.1.7 Alternative 4 (Agricultural Lands) 3-7
3.1.8 Potential Mitigation Measures (Agricultural Lands) 3-8
3.2 Air Quality 3-9
3.2.1 Assessment Methods (Air Quality) 3-9
3.2.2 Significance Criteria (Air Quality) 3-9
3.2.3 No Action Alternative (Air Quality) 3-9
3.2.4 Alternative 1 (Air Quality) 3-9
3.2.5 Alternative 2 (Air Quality) 3-10
3.2.6 Alternative 3 (Air Quality) 3-10
3.2.7 Alternative 4 (Air Quality) 3-11
3.2.8 Potential Mitigation Measures (Air Quality) 3-11
3.3 Climate Change and Greenhouse Gas Emissions 3-12
3.3.1 Assessment Methods (Climate Change and GHG) 3-12
3.3.2 Significance Criteria (Climate Change and GHG) 3-12
3.3.3 No Action Alternative (Climate Change and GHG) 3-12
3.3.4 Alternative 1 (Climate Change and GHG) 3-12
3.3.5 Alternative 2 (Climate Change and GHG) 3-13
3.3.6 Alternative 3 (Climate Change and GHG) 3-14
3.3.7 Alternative 4 (Climate Change and GHG) 3-15
3.3.8 Climate Change Impacts 3-16
3.3.9 Potential Mitigation Measures (Climate Change and GHG) 3-16
3.4 Water Supply, Flood Storage, and Operation 3-16
3.4.1 Assessment Methods (Water Supply, Flood Storage, and Operation) 3-16
3.4.2 Significance Criteria (Water Supply, Flood Storage, and Operation) 3-16
3.4.3 No Action Alternative (Water Supply, Flood Storage, and Operation) 3-16
3.4.4 Alternative 1 (Water Supply, Flood Storage, and Operation) 3-17
3.4.5 Alternative 2 (Water Supply, Flood Storage, and Operation) 3-17
3.4.6 Alternative 3 (Water Supply, Flood Storage, and Operation) 3-18
3.4.7 Alternative 4 (Water Supply, Flood Storage, and Operation) 3-18

3.4.8 Potential Mitigation Measures (Water Supply, Flood Storage, and Operation) ... 3-19
3.5 Hazardous Materials ... 3-19
3.5.1 Assessment Methods (Hazardous Materials) ... 3-19
3.5.2 Significance Criteria (Hazardous Materials) ... 3-19
3.5.3 No Action Alternative, Alternatives 1, 2, and 3 (Hazardous Materials) . 3-20
3.5.4 Alternative 4 (Hazardous Materials) ... 3-20
3.5.5 Potential Mitigation Measures (Hazardous Materials) ... 3-20
3.6 Navigation ... 3-21
3.6.1 Assessment Methods (Navigation) ... 3-21
3.6.2 Significance Criteria (Navigation) ... 3-21
3.6.3 No Action Alternative (Navigation) ... 3-21
3.6.4 Alternative 1 (Navigation) ... 3-22
3.6.5 Alternatives 2, 3, and 4 (Navigation) ... 3-22
3.6.6 Potential Mitigation Measures (Navigation) ... 3-22
3.7 Energy ... 3-23
3.7.1 Assessment Methods (Energy) ... 3-23
3.7.2 Significance Criteria (Energy) ... 3-23
3.7.3 No Action Alternative (Energy) ... 3-23
3.7.4 Alternative 1 (Energy) ... 3-24
3.7.5 Alternative 2 (Energy) ... 3-24
3.7.6 Alternative 3 (Energy) ... 3-25
3.7.7 Alternative 4 (Energy) ... 3-25
3.7.8 Potential Mitigation Measures (Energy) ... 3-26
3.8 Land Use Compatibility ... 3-27
3.8.1 Assessment Methods (Land Use Compatibility) ... 3-27
3.8.2 Significance Criteria (Land Use Compatibility) ... 3-27
3.8.3 No Action Alternative (Land Use Compatibility) ... 3-27
3.8.4 Alternatives 1, 2, 3, and 4 (Land Use Compatibility) ... 3-27
3.8.5 Potential Mitigation Measures (Land Use Compatibility) ... 3-28
3.9 Public Infrastructure and Utilities ... 3-28
3.9.1 Assessment Methods (Public Infrastructure and Utilities) ... 3-28
3.9.2 Significance Criteria (Public Infrastructure and Utilities) ... 3-28
3.9.3 No Action Alternative (Public Infrastructure and Utilities) ... 3-28
3.9.4 Alternative 1 (Public Infrastructure and Utilities) ... 3-29
3.9.5 Alternative 2 (Public Infrastructure and Utilities) ... 3-30
3.9.6 Alternative 3 (Public Infrastructure and Utilities) ... 3-31
3.9.7 Alternative 4 (Public Infrastructure and Utilities) ... 3-31
3.9.8 Potential Mitigation Measures (Public Infrastructure and Utilities) ... 3-32
3.10 Social Services and Community Facilities ... 3-33
3.10.1 Assessment Methods (Social Services and Community Facilities) ... 3-33
3.10.2 Significance Criteria (Social Services and Community Facilities) ... 3-33
3.10.3 No Action Alternative (Social Services and Community Facilities) ... 3-33
3.10.4 Alternative 1 (Social Services and Community Facilities) ... 3-34
3.10.5 Alternative 2 (Social Services and Community Facilities) ... 3-34

3.10.6 Alternative 3 (Social Services and Community Facilities) 3-35
3.10.7 Alternative 4 (Social Services and Community Facilities) 3-36
3.10.8 Potential Mitigation Measures (Social Services and Community Facilities) 3-37
3.11 Environmental Justice 3-37
3.11.1 Assessment Methods (Environmental Justice) 3-37
3.11.2 Significance Criteria (Environmental Justice) 3-37
3.11.3 No Action Alternative (Environmental Justice) 3-37
3.11.4 Alternative 1 (Environmental Justice) 3-37
3.11.5 Alternative 2 (Environmental Justice) 3-38
3.11.6 Alternative 3 (Environmental Justice) 3-38
3.11.7 Alternative 4 (Environmental Justice) 3-39
3.11.8 Potential Mitigation Measures (Environmental Justice) 3-39

Section 4 Conclusions 4-1

4.1 Agricultural Lands 4-1
4.2 Air Quality 4-1
4.3 Climate Change and Greenhouse Gas Emissions 4-1
4.4 Water Supply, Flood Storage, and Operation 4-1
4.5 Hazardous Materials 4-1
4.6 Navigation 4-2
4.7 Energy 4-2
4.8 Land Use Compatibility 4-2
4.9 Public Infrastructure and Utilities 4-2
4.10 Social Services and Community Facilities 4-2
4.11 Environmental Justice 4-2

Section 5 References 5-1

Tables

Table 2.1-1. Land in Farms by County in 2002 and 2007 2-3
Table 2.1-2. Hay Production and Change in Area from 2002 to 2007 2-4
Table 2.1-3. Livestock Farms and Change in Number from 2002 to 2007 2-4
Table 2.1-4. Agricultural Lease Areas and Use 2-6
Table 2.1-5. Prime Farmland in the Counties around Eufaula Lake 2-7
Table 2.2-1. National Ambient Air Quality Standards 2-10
Table 2.2-2. Annual Air Quality Monitoring Data 2-12
Table 2.3-1. 2010 Greenhouse Gas Emissions from Large Facilities 2-14
Table 2.7-1. Residential Electricity Consumption, 2010 2-27
Table 2.7-2. Residential Natural Gas Consumption, 2010 2-27
Table 2.7-3. Projections of Maximum Electricity Demand, 2010 - 2019 2-28

Table 2.9-1. Airports that Serve the Study Area 2-32

Table 2.9-2. Intermodal Facilities Near Eufaula Lake 2-34

Table 2.9-3. Dams At and Near Eufaula Lake 2-34

Table 2.9-4. Water Systems that Serve the Study Area 2-36

Table 2.9-5. Wastewater Providers that Serve the Study Area 2-36

Table 2.9-6. Landfills that Serve the Study Area 2-37

Table 2.10-1. Public School Districts and 2011 through 2012 Enrollment 2-40

Table 2.10-2. Colleges and Universities 2-41

Table 2.10-3. Libraries 2-43

Table 2.10-4. Fire Stations 2-43

Table 2.10-5. Sheriff and Police Departments 2-44

Table 2.10-6. Correctional Facilities 2-44

Table 2.10-7. Hospitals and Medical Centers 2-46

Table 2.11-1. Summary of Minority Populations by Nation, State, and County 2-49

Table 2.11-2. Minority Population of the Census tracts within the Study Area as Compared to State 2-49

Table 2.11-3. Summary of Poverty Rate and Median Household Income by Nation, State, and County 2-50

Figures

Figure 2.1-1. Agricultural Lease Lands in Study Area 2-5

Figure 2.1-2. Farmland Classifications around Eufaula Lake 2-8

Figure 2.4-1. Eufaula Dam 2-19

Figure 2.5-1. Hazardous Materials Sites near Eufaula Lake 2-23

Figure 2.6-1. Small Boat Navigation Aids in Eufaula Lake 2-25

Figure 2.7-1. Projected Residential Natural Gas Consumption, West South Central Region (2008-2035) 2-29

Figure 2.9-1. Airports Serving the Study Area 2-33

Figure 2.9-2. Transportation Infrastructure Serving the Study Area 2-35

Figure 2.9-3. Water, Wastewater, and Solid Waste Facilities Serving the Study Area 2-38

Figure 2.10-1. Educational Facilities that Serve the Study Area 2-42

Figure 2.10-2. Public Safety Facilities 2-45

Figure 2.10-3. Medical Facilities that Serve the Study Area 2-47

Figure 2.11-1. Minority Rates within the Census Tracts of the Study Area per 2010 U.S. Census Data 2-51

Figure 2.11-2. Poverty Rate and Median Household Income within the Census Tracts of the Study Area per 2010 U.S. Census Data 2-52

Figure 3.11-1. Alternative 4 Proposed Development in Relation to the Minority Rate within the Census Tracts of the Study Area per 2010 U.S. Census Data 3-40

Figure 3.11-2. Alternative 4 Proposed Development in Relation to the Poverty Rate and Median Household Income within the Census Tracts of the Study Area per 2010 U.S. Census Data 3-41

Acronyms

$\mu g/m^3$	micrograms per cubic meter
µS/cm	microsiemens per centimeter
ADA	Americans with Disabilities Act
AF	acre-feet
AFY	acre-feet per year
AMD	acid mine drainage
APE	area of potential effect
BLM	Bureau of Land Management
BMP	Best Management Practice
C1	Commercial district
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Code	Oklahoma Environmental Quality Code
CRP	Conservation Reserve Program
CSC	Connors State College
CWA	Clean Water Act
DEQ	Department of Environmental Quality
DO	dissolved oxygen
DOT	Department of Transportation
EA	Environmental Assessment
EIA	Energy Information Administration
EIS	Environmental impact statement
EM	Engineer Manual
EMAP	Environmental Monitoring and Assessment Program
EO	Executive Order
EOSC	Eastern Oklahoma State College
EP	Engineer Pamphlet
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ER	Engineer Regulation
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FLPMA	Federal Land Policy and Management Act
Form AD 1006	Farmland Conversion Impact Rating Form
FPPA	Farmland Protection Policy Act

FSA	Farm Service Agency
FY	Fiscal Year
GAP	Gap Analysis Project
GHG	greenhouse gas
GIS	Geographic Information Systems
gpm	gallons per minute
GRP	Grassland Reserve Program
KATS	KI BOIS Area Transit System
LEPC	Local Emergency Planning Committee
MCT	Muskogee County Transit Authority
MGD	million gallons per day
MP	Master Plan
MSL	mean sea level
MT	metric tons
MW	megawatts
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHB	National Association of Home Builders
NEPA	National Environmental Policy Act
NLA	National Lake Assessment
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resource Conservation Service
O_3	ozone
OAC	Oklahoma Administrative Code
OCC	Oklahoma Conservation Commission
ODEQ	Oklahoma Department of Environmental Quality
ODOT	Oklahoma Department of Transportation
ODPS	Oklahoma Department of Public Safety
ODWC	Oklahoma Department of Wildlife Conservation
OGE	Oklahoma Gas and Electric Company
OHMERC	Oklahoma Hazardous Materials Emergency Response Commission
OHP	Oklahoma Highway Patrol
OMP	operational management plan
ONG	Oklahoma Natural Gas
OSHA	Occupational Safety and Health Administration
OTRD	Oklahoma Tourism and Recreation Department
OWRB	Oklahoma Water Resource Board
Pb	lead
PCBs	polychlorinated biphenyls
$PM_{2.5}$	fine particulate matter with an aerodynamic diameter less than or equal to 2.5 microns

PM_{10}	inhalable particulate matter with an aerodynamic diameter less than or equal to 10 microns
ppb	parts per billion
ppm	parts per million
PPWS	Public and Private Water Supply
PSD	prevention of significant deterioration
PSO	Public Service Company of Oklahoma
PWCs	personal water crafts (*e.g.*, water scooters, Jet-Skis)
R1	Residential 1 (single-family residential district)
R2	Residential 2 (two-family residential district)
R3	Residential 3 (multiple-family residential district)
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Officer
SIP	state implementation plan
SMP	shoreline management plan
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SWT	Southwest Division, Tulsa District
tpy	tons per year
TSCA	Toxic Substances Control Act
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USDOC	U.S. Department of Commerce
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
WMA	wildlife management area
WQS	Water Quality Standards

Section 1
Introduction

To determine the significance of impacts, the severity of the potential impact is examined in terms of the type, quality and sensitivity of the resource involved, the duration of the effect (short- or long-term) and other considerations of context.

The potential revisions to the SMP, supplements to the MP land classification maps, and actions on the request for a lease of government land at Carlton Landing and the individual zoning requests were found to have minimal to no effect on several of the resource categories analyzed. These resource categories are listed below and are discussed in detail in this appendix. Section 2 describes the affected environment or existing conditions for each of these resource categories at Eufaula Lake. Section 3 provides an analysis of the potential effects of the No Action Alternative and each action alternative for each resource category. Potential cumulative effects are described in Chapter 5 of the Draft EIS for all resource categories.

The resource categories for which there would be no or minimal effects associated with any of the alternatives include:

- Agricultural Lands
- Air Quality
- Climate Change and Greenhouse Gas Emissions
- Water Supply, Flood Storage, and Operation
- Hazardous Materials
- Navigation
- Energy
- Land Use Compatibility
- Public Infrastructure and Utilities
- Social Services and Community Facilities
- Environmental Justice

Although there were no significant effects identified related to socioeconomics and demographics, issues were raised during scoping related to socioeconomic concerns. The issues raised during scoping were primarily related to honoring the expectations of property owners who had purchased land adjacent to the lake with the expectation that they would be able to construct new or maintain existing private docks. Since socioeconomics and demographics were raised as a scoping issue, they are discussed in the Draft EIS.

Resource categories with potentially significant direct, indirect, and/or cumulative impacts under one or more alternatives are listed below and are discussed in detail in the Draft EIS. For these resource categories, the affected environment is described in Chapter 3 of the Draft EIS, and the environmental consequences of each alternative are described in Chapter 4 of the Draft EIS.

- Vegetation, Wetlands, and Aquatic Habitats
- Fish and Wildlife
- Water Quality
- Geology, Soils, and Mineral Resources
- Aesthetics and Visual Resources
- Cultural and Historic Resources
- Recreation
- Noise
- Transportation
- Public Lands and Access

Section 2
Affected Environment

This chapter describes current environmental and socioeconomic conditions at Eufaula Lake and in the surrounding area for the resource categories described in Section 1. It describes each resource that could be affected by the revisions to the SMP and MP and by action on the rezone and lease request at Carlton Landing and on the individual zoning requests submitted during scoping.

The information in this section also serves as a baseline from which to identify and evaluate potential environmental and socioeconomic changes resulting from actions under consideration. The information has been provided in only enough detail to understand the effects of the alternatives on the environment and depicts conditions as they currently exist based on the most recent available data. The environmental consequences of the alternatives for revising the SMP and MP and for actions on the requests for rezones and a lease of USACE land at Carlton Landing are discussed in Section 3 for these resource categories.

2.1 Agricultural Lands

This section describes the existing agricultural lands in the area of analysis as well as applicable regulations related to agricultural lands. Potential impacts from implementation of the No Action and action alternatives are discussed in Section 3.1.

2.1.1 Area of Analysis (Agricultural Lands)

The area of analysis for direct impacts to agricultural resources includes the USACE-owned lands which could undergo changes in shoreline allocations or land use classification as a result of implementation of any of the action alternatives under consideration. This area is primarily encompassed by McIntosh, Haskell, Pittsburg, and Muskogee Counties, with small portions in Okmulgee and Latimer Counties (USACE 1977).

The area of analysis for indirect impacts to agricultural resources includes both government-owned and privately-owned lands around Eufaula Lake that may have the potential to be developed into residential, recreational, or commercial uses following potential shoreline allocation changes. USACE has granted several leases for agricultural activities on USACE lands.

2.1.2 Regulatory Setting (Agricultural Lands)

Farmland Protection Policy Act

Congress passed the Agriculture and Food Act of 1981 which includes the Farmland Protection Policy Act (FPPA). The purpose of the law is to "minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to non-agricultural uses…" (Public Law 97-98, Sec. 1539-1549; 7 U.S.C. 4201, *et seq.*). Federal agencies are to consider alternative actions, as appropriate, that could lessen adverse effects of federal programs on the protection of farmland. The FPPA also stipulates that federal programs should be compatible with state, local, and private efforts to protect farmland. As defined in the

law, federal programs include construction projects sponsored or financed in whole or part by the federal government, and the management of federal lands (American Farmland Trust 2006).

The law defines "farmland" as prime farmland, unique farmland, and farmland, other than prime or unique farmland, that is of statewide or local importance (7 C.F.R. Part 658). Farmland subject to FPPA requirements does not have to be currently used for cropland. It can also be forest land, pastureland, or other land that could be used as farmland, but does not include water or urban built-up land. The three main categories of farmland are defined as follows (7 USC 4201):

Prime Farmland: land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion.

Unique Farmland: land other than prime farmland that is used for production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated or managed according to acceptable farming methods.

Farmland of Statewide or Local Importance: land other than prime or unique farmland that is of statewide or local importance for the production of food feed, fiber, forage, or oilseed crops, as determined by the appropriate state or unit of local government agency or agencies.

The FPPA specifically requires that federal agencies use the criteria provided in Section 658.5 to identify and assess the effects of federal projects that may convert farmland to another use (USDA, NRCS 1984). The criteria in Section 658.5 consist of two parts: the land evaluation criteria and the site assessment criteria. The land evaluation criteria is used to assign a score between 0 and 100 to the agricultural land proposed for conversion. This score is referred to as the Relative Value Rating on the Farmland Conversion Impact Rating Form (Form AD 1006). Form AD 1006 is used by the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) to make a determination under the FPPA about the relative value of the land being evaluated for agricultural production as compared to other farmland in the same local government jurisdiction. The site assessment criteria assess the suitability of the proposed site or design alternatives and their suitability for protection as farmland (7 C.F.R Part 658.5). If a site scores poorly on the site assessment criteria then protection of the site as farmland may not have as high a priority as other potential uses.

Conservation Reserve Program

The Conservation Reserve Program (CRP) is a federal program administered by the USDA Farm Service Agency (FSA). The CRP is a voluntary program that offers annual rental payments, incentive payments, and annual maintenance payments for certain activities, and cost-share assistance to establish approved cover on eligible cropland. To be eligible for placement in the CRP, land must be (1) cropland that is planted or considered planted with an agricultural commodity in two out of the five most recent crop years (including field margins) and that is physically and legally capable of being planted in a normal manner to an agricultural commodity or (2) marginal pastureland that is either enrolled in the Water Bank Program or suitable for use as a riparian buffer to be planted with trees. As of May 2012, there was a total of 824,941.6 acres of CRP cropland in the State of Oklahoma (USDA FSA 2012). Counties in the area of analysis with cropland acres in the CRP include: Muskogee (190.7 acres) and Okmulgee (74.8 acres) (FSA 2012).

Grassland Reserve Program (GRP)

The Grassland Reserve Program (GRP) is a voluntary conservation program that emphasizes support for working grazing operations, enhancement of plant and animal biodiversity, and protection of grassland under threat of conversion to other uses.

Participants voluntarily limit future development and cropping uses of the land while retaining the right to conduct common grazing practices and operations related to the production of forage and seeding, subject to certain restrictions during nesting seasons of bird species that are in significant decline or are protected under federal or state law. A grazing management plan is required for participants.

Producers may apply for GRP on a continuous basis at the local FSA or NRCS office. Application options are for a 10, 15, or 20 year rental contract or a permanent easement. Rental contracts receive an annual rental payment for the contract term. Rental rates are based on a per acre rental rate that may vary by county.

The most recent data on GRP rental contracts in the State of Oklahoma is reported by the NRCS for 2006-2010 (USDA, NRCS 2010). In 2010, there were GRP rental contract obligations in Pittsburgh, Haskell, Muskogee, and Okmulgee Counties.

2.1.3 Existing Conditions (Agricultural Lands)

2.1.3.1 Regional Agricultural Resources

USDA conducts the Census of Agriculture every five years. The most recent census was completed in 2007, and the 2012 census forms are planned to be mailed in December 2012. The census presents county profiles with information on the number of farms and changes in land use. **Table 2.1-1** summarizes farmed acreages in the counties in the study area in 2002 and in 2007 (USDA National Agricultural Statistics Service 2007a – 2007f).

Table 2.1-1. Land in Farms by County in 2002 and 2007

County	Land in Farms (acres); 2002	Land in Farms (acres); 2007	Percent Change
Haskell	274,562	290,260	6%
Latimer	205,652	213,411	4%
McIntosh	266,403	246,730	-7%
Muskogee	351,895	374,372	6%
Okmulgee	288,969	294,324	2%
Pittsburg	505,047	547,050	8%

Source: USDA National Agricultural Statistics Service 2007a – 2007f.

The Census of Agriculture also provides data at the county level on specific agricultural land use categories. **Table 2.1-2** shows hay production acreages in the counties in the study area in 2002 and in 2007 (USDA National Agricultural Statistics Survey 2007g).

Data on livestock is reported at the county level as number of farms raising hogs and pigs and those raising cattle and calves for the years 2002 and 2007 (USDA National Agricultural Statistics Service 2007h). **Table 2.1-3** summarizes the number of livestock farms in the counties in the study area in 2002 and in 2007.

Table 2.1-2. Hay[1] Production and Change in Area from 2002 to 2007

Ag District	County	2002 Acres	2007 Acres	Percent Change
East Central	Haskell	46,329	43,101	-6.97%
Southwest	Latimer	25,448	28,798	13.16%
East Central	McIntosh	45,524	43,004	-5.54%
East Central	Muskogee	71,673	80,450	12.25%
East Central	Okmulgee	50,089	53,587	6.98%
East Central	Pittsburg	61,923	69,614	12.42%

Source: USDA National Agricultural Statistics Service 2007g.

1 - Hay includes all hay including alfalfa, other tame, small grain, and wild.

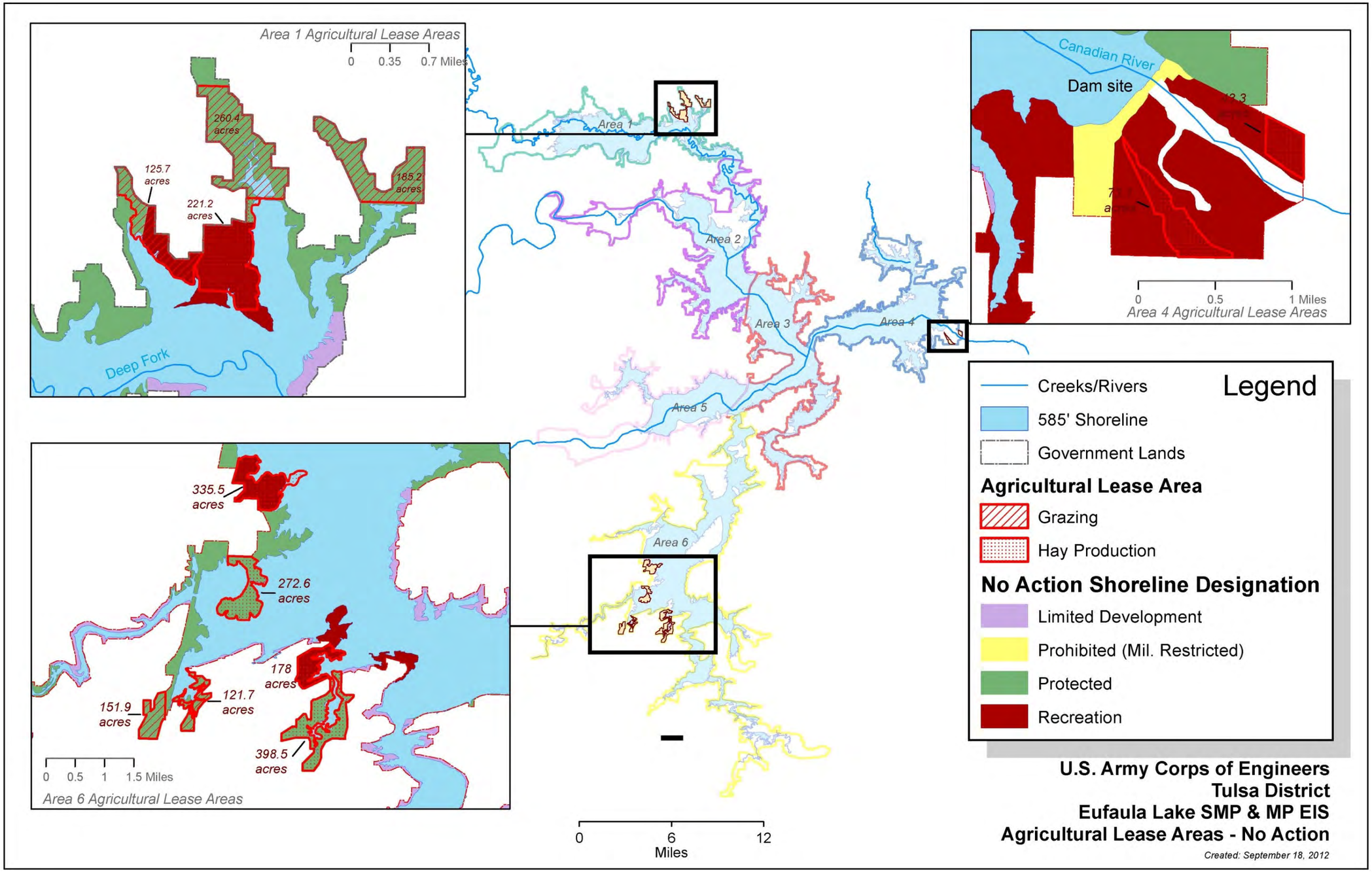
Table 2.1-3. Livestock Farms and Change in Number from 2002 to 2007

County	Cattle and Calves			Hogs and Pigs		
	2002 Farms	2007 Farms	Percent Change	2002 Farms	2007 Farms	Percent Change
Haskell	732	639	-13%	37	33	-11%
Latimer	563	520	-8%	43	47	9%
McIntosh	695	652	-6%	21	29	38%
Muskogee	1,281	1,224	-4%	51	63	24%
Okmulgee	888	897	1%	48	63	31%
Pittsburg	1,377	1,218	-12%	43	39	-9%

Source: USDA National Agricultural Statistics Service 2007h.

2.1.3.2 Study Area Agricultural Resources

Figure 2.1-1 shows the location of agricultural leases on USACE-owned lands around the lake. As shown on the figure, these lands are a mixture of livestock grazing lands and hay production. **Table 2.1-4** summarizes the acreages and uses of these agricultural parcels in the study area. As shown in **Figure 2.1-1**, there are agricultural lease areas in some of the public recreation areas around the lake. Maintaining haying areas within parks is a fairly common practice on USACE lakes in the district as it offers a solution to the areas becoming overgrown without spending money on mowing. As these areas are protected by lease agreements, they would not be affected by implementation of the alternatives; therefore, they are not discussed further.



1 **Figure 2.1-1. Agricultural Lease Lands in Study Area**

Table 2.1-4. Agricultural Lease Areas and Use

Lease Area Number	Use	Acres
0	Grazing	185.18
1	Grazing	260.40
2	Hay	335.53
3	Hay	272.64
4	Grazing	125.69
5	Hay	221.16
6	Hay; Pecan Harvest Permit	43.30
7	Hay; Pecan Harvest Permit	73.11
8	Hay	178.00
9	Hay	398.54
10	Grazing	151.90
11	Grazing	121.69

Farmland Classifications

As described in Section 2.1.2, the term "farmland" has specific definitions under federal law. NRCS surveys and categorizes soil types and corresponding farmland classifications through the Web Soil Survey. Based on soil types, each of the counties in the study area contains a combination of prime and not prime farmland. The following describes the general configuration of these classifications in each county. **Figure 2.1-2** shows where these lands are located in relation to Eufaula Lake.

- Haskell County: The county is bordered on all sides by not prime farmland except along the eastern edge near Highway 9 and in the southwest near Highway 31. These areas have prime farmland. The interior county is a mixture of prime and not prime farmlands (USDA, NRCS 2009).
- Latimer County: Most of the county is not prime farmland with the exception of a wide band running through the center of the county from east to west and aligned roughly along Highway 270. There are also small areas of prime farmland scattered across the southern portion of the county (USDA, NRCS 2008a).
- McIntosh County: Eufaula Lake takes up a large portion of the center of the county. To the northeast of the lake, a majority of the county is prime farmland with some not prime located in the northeastern and northwestern corners. To the southwest of the lake, there is a predominance of not prime farmland mixed in with patches of prime farmland (USDA, NRCS 2008b).
- Muskogee County: The county is largely composed of prime farmland in the northwest, central, and southwestern portions. Not prime farmland exists along the eastern side of the county and in small patches in the southeast and southwest (USDA, NRCS 2008c).
- Okmulgee County: The eastern portion of the county is mainly prime farmland, with not prime farmland mainly in the south and running south to north through the central part of the county. There is also a patch of not prime farmland in the northwest corner of the county above Highway 16 (USDA, NRCS 2008d).

- Pittsburg County: The majority of the county is not prime farmland with small patches of prime farmland located in the north near Indianola, in the east near Blocker, in the center near McAlester, and in the southwest near Ashland and Kiowa (USDA, NRCS 2008e). The proposed Carlton Landing development is located in Pittsburg County, and with the exception of a small pocket of prime farmland soil on Roundtree Landing, the Carlton Landing site is not prime farmland.

Table 2.1-5 summarizes the acreage of prime farmlands in each of the six-counties.

Table 2.1-5. Prime Farmland in the Counties around Eufaula Lake

County	Acres of Prime Farmland
Haskell	113,090
Latimer	65,700
McIntosh	178,371
Muskogee	321,270
Okmulgee	211,289
Pittsburg	170,905

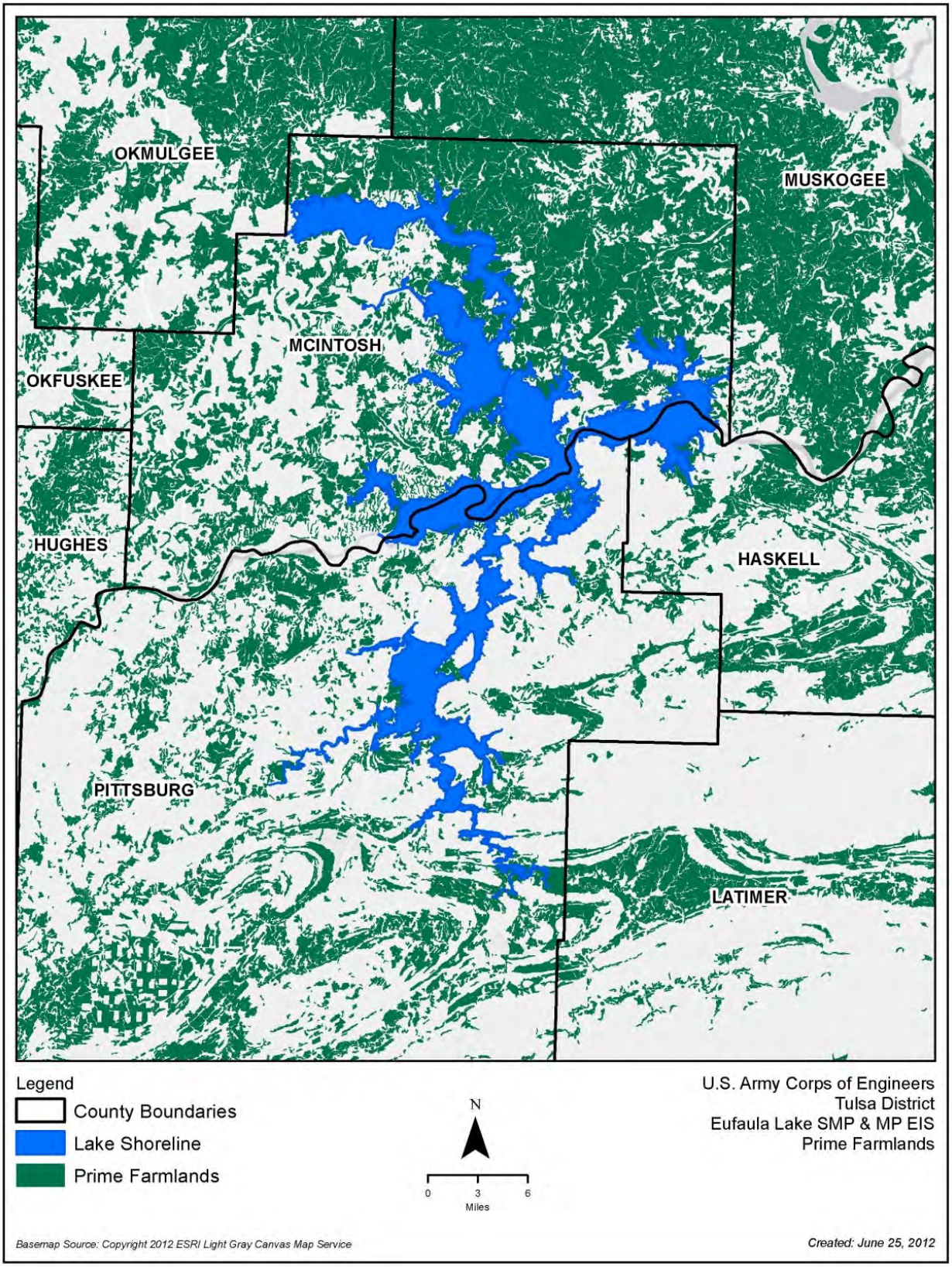


Figure 2.1-2. Farmland Classifications around Eufaula Lake

2.2 Air Quality

This section describes the area studied in the air quality analysis, as well as the regulatory and environmental setting. The regulatory setting describes federal, state and local requirements. Oklahoma state and local air quality standards are based on the federal requirements. The environmental setting describes climate conditions and existing air quality conditions.

2.2.1 Area of Analysis (Air Quality)

The air quality impact analysis evaluates the existing conditions and potential impacts in Haskell, Latimer, McIntosh, Okmulgee, Pittsburg, and Muskogee Counties. These counties surround Eufaula Lake, and air quality in these counties could be impacted from increased air emissions resulting from construction, development, and recreational activities allowed as a result of proposed changes to the SMP and MP.

2.2.2 Regulatory Setting (Air Quality)

Federal, state, and local governments all share responsibility for air quality management. The Federal Clean Air Act (CAA) is the primary statute that establishes national ambient air quality standards (NAAQS). It also establishes regulatory authorities to design and enforce air quality regulations.

2.2.2.1 Clean Air Act

The U.S. Environmental Protection Agency (EPA) is responsible for implementation of the CAA. The CAA defines EPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone (O_3) layer. The last major change in the law, the CAA Amendments of 1990, was enacted by Congress in 1990. Under authority of the CAA, EPA established National Ambient Air Quality Standards (NAAQS) (40 CFR 50) for the following criteria pollutants considered harmful to public health and the environment: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), O_3, inhalable particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), fine particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and sulfur dioxide (SO_2). Primary standards provide public health protection, including protecting the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Table 2.2-1 presents current NAAQS for criteria pollutants. Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air ($\mu g/m^3$).

The CAA mandates that states submit, implement, and enforce a state implementation plan (SIP) to attain and maintain the NAAQS. SIPs must include pollution control measures and demonstrate how standards will be met. Oklahoma has an EPA-approved SIP to address the requirements of the CAA. In the absence of more stringent air quality standards, Oklahoma air quality standards are based on the federal NAAQS. The Air Quality Division of the Oklahoma Department of Environmental Quality (ODEQ) is responsible for implementing the SIP and setting specific emission reduction goals for areas not meeting NAAQS. Areas where air pollution levels persistently exceed the NAAQS are designated as nonattainment areas. According to the EPA’s *Green Book Nonattainment Areas for Criteria Pollutants*, the counties comprising the Eufaula Lake study area are designated as attainment areas for each of the federal criteria air pollutants (EPA 2012d).

Table 2.2-1. National Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Averaging Time	Standard	Violation Criteria
Carbon Monoxide	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead	Primary and Secondary	Rolling 3 month average	0.15 µg/m^3	Not to be exceeded
Nitrogen Dioxide	Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
	Primary and Secondary	Annual	53 ppb	Annual Mean
Ozone	Primary and Secondary	8-hour	0.075 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Fine particulate matter ($PM_{2.5}$)	Primary and Secondary	Annual	15 µg/m^3	Annual mean, averaged over 3 years
		24-hour	35 µg/m^3	98th percentile, averaged over 3 years
Inhalable particulate matter (PM_{10})	Primary and Secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)	Primary	1-hour	75 ppb[1]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: EPA 2011

1 -Final rule signed June 2, 2010. The 1971 annual and 24-hour SO2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

2.2.2.2 General Conformity Rule

Established under Section 176 (c)(4) of the CAA, the General Conformity Rule ensures that federal actions (*i.e.,* providing financial assistance for licenses, permits, or approvals) in nonattainment and maintenance areas do not interfere with a state's plans to meet national standards for air quality. In this context, conformity means that such federal actions must be consistent with a SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of those standards. Each federal agency must determine that any action that is proposed by the agency and that is subject to the regulations implementing the conformity requirements will, in fact, conform to the

applicable SIP before the action is taken. The General Conformity Rule does not apply to the Eufaula Lake SMP update and MP supplement because the Eufaula Lake study area is in attainment for all criteria pollutants.

2.2.3 Existing Conditions (Air Quality)

Air quality conditions for a project area are typically the result of metrological conditions and existing emission sources in an area. The climate of eastern Oklahoma is described as humid subtropical. Warm, moist air from the Gulf of Mexico often results in humidity, cloudiness, and precipitation. Summers are long and hot, and winters are shorter and less severe than those of the northern Plains states (Oklahoma Climatological Survey 2012). Ozone season is March to November when warm temperatures and sunlight interact and chemically mix with other pollutants such as nitrogen oxides (NOx) and volatile organic compounds (VOCs) producing ground level O_3.

The main source of air emissions in the Eufaula Lake study area is from mobile emission sources. Mobile emission sources include fuel emissions from on-road motor vehicles and off-road vehicles, engines, and equipment. On-road vehicle emissions result from traffic in the area and would increase during the summer recreation and tourism season when more vehicles are traveling to Eufaula Lake. Off-road vehicles, engines, and equipment at Eufaula Lake include recreational engines and vehicles, including watercraft, construction equipment and vehicles, and lawn and garden equipment. As with increased on-road motor vehicle emissions, emissions from recreational vehicles and equipment increase during the summer recreation season.

Other sources of emissions include building heating and cooling, stationary small engines, wood burning, landscaping, and fugitive dust primarily from construction sites, paved and unpaved roadways, and farming operations. Fugitive dust is a major source of particulate matter, PM_{10} and $PM_{2.5}$, and a major cause of reduced visibility or haze.

2.2.3.1 Monitoring Data

The ODEQ Air Quality Division maintains 26 monitoring sites for criteria pollutants in twelve counties. The closest monitoring site to the Eufaula Lake study area is in McAlester, OK, the county seat of Pittsburg County, and is approximately eight miles from the southwest edge of Eufaula Lake. The next closest monitoring station is in Muskogee, OK, approximately 28 miles northwest of Eufaula Lake (ODEQ 2010). The McAlester monitoring station monitors for O_3 and $PM_{2.5}$, and the Muskogee monitoring site monitors for PM_{10} and SO_2. Air quality data from the two monitoring stations are summarized in **Table 2.2-2** for the years 2009, 2010, and 2011. CO and NO_2 were not included in the analysis because they are monitored in Oklahoma City and Tulsa, which is too far from Eufaula Lake to be representative of air quality conditions in the study area.

Recorded 8-hour O_3 concentrations increased in 2011 to 0.85 ppm, which exceeds the EPA federal standard; however, the area is still in attainment because the annual fourth-highest daily maximum 8-hour concentration, averaged over three years, is less than the NAAQS of 0.075 ppm. $PM_{2.5}$ is below the NAAQS for both the annual mean and 24-hour concentration levels. PM_{10} exceeded the highest 24-hour concentration in 2010 but is still in attainment because it was not exceeded more than once in 2010 and the average over 3 years also did not exceed the NAAQS. The 1-hour concentration of SO_2 significantly increased in 2011 but the average over 3 years did not exceed the NAAQS. Despite increases in certain years, the counties comprising the Eufaula Lake study area are designated as attainment areas for each of the federal criteria air pollutants.

Table 2.2-2. Annual Air Quality Monitoring Data

Criteria Air Pollutant/ Monitoring Location	Annual Monitoring Data			
	2009	2010	2011	NAAQS EPA Federal Standard
Ozone (O_3) McAlester, OK Pittsburg County				
Highest 8-hour concentration (ppm)	0.071	0.068	0.85	0.075
Fine particulate matter ($PM_{2.5}$) McAlester, OK Pittsburg County				
Annual Mean (µg/m^3)	9.8	9.8	10.6	15
24-hour concentration, 98th percentile (µg/m^3)	22	18	20	35
Inhalable particulate matter (PM_{10}) Muskogee, OK Muskogee County				
Highest 24-hour concentration (µg/m^3)	137	151	145	150
Sulfur Dioxide (SO_2) Muskogee, OK Muskogee County				
1-hour concentration, 99th percentile (ppb)	40	30	94	75

Source: EPA 2012a

2.3 Climate Change and Greenhouse Gas Emissions

Climate change is a shift in the average weather patterns observed on Earth, which can be measured by such variables as temperature, wind patterns, storms, and precipitation. This section describes the area studied in the climate change and greenhouse gas (GHG) emission analysis, as well as the regulatory and environmental setting. The regulatory setting describes federal, state, and local requirements with respect to GHG emissions. Oklahoma state and local GHG standards are based on the federal requirements. The environmental setting describes climate conditions and existing GHG conditions and trends.

2.3.1 Background

Greenhouse gases trap energy in the atmosphere and cause it to warm. This phenomenon is called the greenhouse effect and is a natural and necessary process that helps to support life on Earth. However, the buildup of GHGs can change the Earth's climate and result in dangerous effects to human health and welfare and to ecosystems. The majority of GHG emissions come from burning fossil fuels to produce energy, although deforestation, industrial processes, and some agricultural practices also emit GHGs into the atmosphere.

The largest source of GHG emissions from human activities in the United States is from burning fossil fuels for electricity, heat, and transportation. Specifically, sources of GHG emissions in the United States include the following (EPA 2012c):

- Transportation - burning of fossil fuels, mostly petroleum-based fuels.
- Electricity production - burning fossil fuels, mostly coal and natural gas.
- Industry - burning fossil fuels for energy as well as from certain chemical reactions necessary to produce goods from raw materials.
- Commercial and Residential - burning of fossil fuels for heat, the use of certain products that contain greenhouse gases, and the handling of waste.
- Agriculture - livestock such as cows, agricultural soils, and rice production.
- Land Use and Forestry - land areas can act as a sink (absorbing carbon dioxide [CO_2] from the atmosphere) or a source of GHG emissions.

The climate of eastern Oklahoma is described in Section 2.2.3. Climate change impacts include increased temperatures, sea level rise, and habitat change. Specifically in the Eufaula Lake study area, climate change impacts may include warmer winters, fewer but more intense precipitation events, and hotter or drier conditions (Crawford 2009). Changing precipitation patterns may alter the lake ecosystem and vegetation though fluctuating lake levels and invasion of non-native plant and animal species.

2.3.2 Area of Analysis (Climate Change and GHG)

The climate change and GHG emissions impact analysis evaluates the existing conditions and impacts in Haskell, Latimer, McIntosh, Okmulgee, Pittsburg, and Muskogee Counties. These counties surround Eufaula Lake, and the climate in these counties could be impacted from increased GHG emissions resulting from construction, development, and recreational activities allowed as a result of proposed revisions to the SMP and MP.

2.3.3 Regulatory Setting (Climate Change and GHG)

GHG emissions are currently regulated as “air pollutants” pursuant to the Federal Clean Air Act (CAA). Responsibility for implementation of the CAA rests with EPA and is delegated to the State of Oklahoma. In Oklahoma, ODEQ implements air quality regulations. GHG emissions are also subject to reporting under EPA’s Mandatory Greenhouse Gas Reporting Rule. The Mandatory Greenhouse Gas Reporting Rule (40 CFR 98) requires suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more of carbon dioxide equivalent (CO_2e) per year to submit annual reports to EPA. Reporting started in 2011 for the calendar year 2010 except for vehicle and engine manufacturers which began reporting for model year 2011.

Additionally, EPA issued a final rule on June 3, 2010 to amend the applicability criteria that determine when stationary sources and modification projects are subject to prevention of significant deterioration (PSD) and Title V permitting programs for GHG emissions (75 FR 31514). The Tailoring Rule applies a threshold for obtaining these permits for GHG emissions of 75,000 to 100,000 tons per year (tpy) of CO_2e.

The key elements of the Tailoring Rule were phased in starting on January 2, 2011. During that phase, only stationary sources that were already subject to PSD permitting requirements were required to permit GHG emissions. Permitting was required for new sources that emit 75,000 tpy CO_2e and for existing major stationary sources that had an emissions increase of 75,000 tpy CO_2e. During that phase of permitting, no source was subject to PSD permitting solely because of its GHG emissions. Beginning July 1, 2011,

permitting is now required for new stationary sources or for modifications that would increase CO_2e emissions by 100,000 tpy. This second phase of permitting applies to both PSD and Title V permitting programs.

2.3.4 Existing Conditions (Climate Change and GHG)

GHG emissions result from the combustion of fossil fuels for electricity, heat, and transportation, the decomposition of waste and other organic matter, and the volatilization of gases from various other sources. To-date, a GHG emissions inventory has not been conducted for the Eufaula Lake study area. However, data is available on major sources of stationary emissions for facilities and suppliers required to report under the EPA's Mandatory GHG Reporting Program within and near the study area. Based on data retrieved from EPA's searchable online map, **Table 2.3-1** identifies the major stationary sources of GHG emissions in the Eufaula Lake study area, including power plants, refineries, chemical factories, landfills, and paper mills (EPA 2012b).

Based on this emissions data of major stationary sources along with an evaluation of activities at Eufaula Lake and in the surrounding areas, potential GHG emission sources and a qualitative assessment of existing conditions can be determined. A qualitative assessment of GHG emissions conditions is described below by main source types in the Eufaula Lake study area.

Table 2.3-1. 2010 Greenhouse Gas Emissions from Large Facilities

Sector	Facility Name	County	Location	Source/Process	Metric Tons of CO_2e per year
Power Plants	Muskogee	Muskogee	Fort Gibson, OK	Natural gas and subbituminous coal electricity production; natural gas stationary combustion	8,237,526
	Tenaska Kiamichi Generating Station	Pittsburg	Kiowa, OK	Natural gas electricity generation	1,261,519
Pulp and Paper	Georgia Pacific Consumer Products LP/Muskogee Mill	Muskogee	Muskogee, OK	Natural gas and subbituminous coal stationary combustion	958,013
Minerals	Anchor Glass Container Corporation	Okmulgee	Henryetta, OK	Natural gas stationary combustion; glass production	98,893
	Dal-Italia	Muskogee	Muskogee, OK	Natural gas stationary combustion	64,879
	Owens Brockway Glass Container Incorporated	Muskogee	Muskogee, OK	Natural gas stationary combustion; glass production	66,022

Sector	Facility Name	County	Location	Source/Process	Metric Tons of CO_2e per year
Landfills	Elliott Construction Company Landfill	Okmulgee	Morris, OK	Landfill	25,700
	Alderson Regional Landfill	Pittsburg	Alderson, OK	Landfill	31,786
	Muskogee Community Landfill	Muskogee	Muskogee, OK	Landfill	90,022
Other Industrial	CP Kelco US, Inc.	Okmulgee	Okmulgee, OK	Natural gas stationary combustion	74,977
	Chandler Compressor Station/Wilburton Compressor Station	Latimer	Wilburton, OK	Stationary combustion	62,429
	East Rockpile Gas Plant	Pittsburg	McAlester, OK	Stationary combustion	35
	Verner	Pittsburg	McAlester, OK	Stationary combustion	27,564
Total					**10,999,365**

Source: EPA. 2012a. GHG Data: 2010 Greenhouse Gas Emissions from Large Facilities. Available at: http://ghgdata.epa.gov/ghgp/main.do. Accessed August 13, 2012.

2.3.4.1 Transportation

Similar to air emissions as described in Section 2.2, the main source of GHG emissions in the Eufaula Lake study area is from mobile emission sources. Mobile emission sources include fuel emissions from on-road motor vehicles and off-road vehicles, engines, and equipment. Off-road vehicles, engines, and equipment at Eufaula Lake include watercraft, construction equipment and vehicles, and lawn and garden equipment. GHG emissions from both on-road and off-road motor vehicles would increase during the recreation and tourism season when travel to and from Eufaula Lake and watercraft use increases. As discussed in Section 3.9 of the Draft EIS, Transportation, traffic volumes on major state routes or highways around the lake are considered to be low. In areas with more development, such as along Highway 9 near the City of Eufaula and Eufaula Cove North, the City of McAlester, and Belle Starr Park, there is more traffic and more mobile source GHG emissions. Similarly, in areas where the highest levels of on-water recreation takes place there is more vehicle traffic on the roads.

2.3.4.2 Electricity and burning of fossil fuels

There are two power plants in the Eufaula Lake study area: Muskogee Power Plant in Fort Gibson, OK and Tenaska Kiamichi Generating Station in Kiowa, OK. These power plants together emitted a combined 9,499,045 metric tons of CO_2e as reported in 2010 (EPA 2012c). They are both fossil fuel power plants; the Muskogee Power Plant produces electricity from natural gas and coal, and the Tenaska Kiamichi Generating Station produces electricity from natural gas.

In addition to the emissions produced from energy suppliers, GHG emissions result from electricity consumption and burning of fossil fuels for energy. Oklahoma's electricity production is predominately from carbon-based fuels, specifically natural gas, which results in CO_2 emissions. However, the renewable energy profile of the state is increasing and approximately 9.6 percent of Oklahoma's electricity production was from renewable sources in 2010 (U.S. EIA 2012b). In fact, Oklahoma ranked seventh in the country in

net electricity generation from wind in 2011 (U.S. EIA 2012b). Renewable electricity production has significantly lower life cycle GHG emissions than fossil fuel electricity production.

Electricity needs are greater in more developed areas of the Eufaula Lake study region. There are over 250 housing developments located in close proximity to the shoreline. Building heating, cooling, stationary small engines, wood burning, and landscaping are also contributors to GHG emissions.

2.3.4.3 Industrial

The Eufaula Lake study area is home to industries including pulp and paper manufacturing, mineral processing, glass production, and others. **Table 2.3-1** identifies the major stationary sources of GHG emissions. Direct emissions are produced by burning fuel for power or heat, through chemical reactions, and from leaks from industrial processes or equipment.

2.3.4.4 Solid Waste Disposal

Waste disposal from residential and commercial areas and park operations also result in GHG emissions. According to the Oklahoma DEQ, there are four municipal solid waste landfills and four transfer stations within the study area. Anaerobic decomposition of waste in landfills produces methane (CH_4). In addition, the transportation of waste to disposal sites produces GHG emissions from the combustion of the fuel used in the equipment.

According to the EPA's searchable online map of major stationary emission sources, there are three landfills in the Eufaula Lake study area that emitted a combined total of 147,508 metric tons of CO_2e as reported in 2010 (EPA 2012a).

2.3.4.5 Wastewater Treatment

Wastewater treatment is a source of CO_2, CH_4, and nitrous oxide (N_2O). As discussed in Section 2.9, Public Infrastructure and Utilities, there are more than 30 wastewater service providers within the study area. These facilities include mechanical and lagoon retention facilities. Since municipal wastewater treatment plants are not required to report their GHG emissions, an estimate of their contribution to the study area's GHG emissions is not available.

2.3.4.6 Agriculture

As discussed in Section 2.1, Agricultural Lands, there were 1.97 million acres of farmland in the six-county region in 2007 (USDA National Agricultural Statistics Service 2007a – 2007f). Over 318,500 acres of land was used for hay production (USDA National Agricultural Statistics Service 2007g). There is not much row crop production in the Eufaula Lake study area; however, there are 5,150 farms raising cattle and calves and 274 raising hogs and pigs (USDA National Agricultural Statistics Service 2007h). Hay production results in GHG emissions, specifically N_2O, from fertilizer application, irrigation, and tillage. Grazing operations result in GHG emissions from livestock manure, which produces CH_4. N_2O and CH_4 are 310 and 21 times more potent than CO_2, respectively, in producing atmospheric warming effects.

2.3.4.7 Land Use and Forestry

Biological sequestration of CO_2 can help to reduce the effects of climate change. Plants and soil, depending on how soils are managed, can act as carbon "sinks" and absorb CO_2, thus reducing GHG emissions. The forested areas of Eufaula Lake serve as carbon sinks and offset the GHG emissions produced from other sources in the study area.

2.4 Water Supply, Flood Storage, and Operations

This section provides information on existing conditions at Eufaula Lake with respect water supply, flood storage, and operations by USACE.

2.4.1 Area of Analysis (Water Supply, Flood Storage, and Operations)

The area of analysis for this section includes the lake and the adjacent lands surrounding the lakeshore. Facilities associated with operation of the dam, water supply, and flood storage capacities of the lake are also included.

The lake is generally defined as the area below an elevation of 585 feet above mean sea level. This is the "normal" lake level and is also referred to as the "conservation pool" elevation. It is the level at which the lake is maintained most of the time to optimize power production.

2.4.2 Regulatory Setting (Water Supply, Flood Storage, and Operations)

2.4.2.1 Federal

Clean Water Act (CWA), as amended, (formerly known as Water Pollution Control Act), and implementing regulations, 33 U.S.C. 1344 et seq., 33 CFR 320 et seq.

The CWA established requirements that a) limits be determined for point source discharges and stormwater that are consistent with state water quality standards, b) procedures for state issuance of water quality standards be developed, c) guidelines to identify and evaluate the extent of nonpoint source pollution be developed, d) water quality inventory requirements be implemented, and e) toxic and pretreatment effluent standards be developed. The Act further defined liability for discharges of oil and hazardous substances and the federal role in cleanup operations. Section 404 authorized USACE to issue permits for the discharge of dredged or fill material into waters of the U.S. The CWA also requires EPA to study and monitor water quality effects attributable to the impoundment of water by dams and requires federal agencies to consider, during the planning for any reservoir, storage to regulate stream flow for the purpose of water quality control.

Executive Order 11988: Floodplain Management

This Executive Order directs all federal agencies to avoid, if possible, development and other activities in the 100-year base floodplain. Design and siting of projects are to be based on scientific, engineering, and architectural studies, consideration of human life, natural processes, and cultural resources, and on the planned life span of the project. Federal agencies are required to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out agency responsibilities.

Water Resources Development Act of 1986, as amended (PL 99-662); 33 U.S.C. 2201-2330

The Water Resources Development act provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

USACE Policy Guidance Letter No. 32

This policy guidance letter explains the policy for use of lands with flowage easements over them. Current flowage easement requirements provide that no structures for human habitation shall be constructed or maintained on the land, that no other structure shall be maintained on the land except as may be

approved in writing by USACE, and that no excavation shall be conducted or landfill placed without USACE approval. Approval for structures other than for human habitation rests with the District Engineer.

Engineer Manual 1110-02-3600 Engineering and Design Management of Water Control Systems 1987

This Manual provides guidance to field offices for the management of water control projects or systems authorized by Congress and constructed and operated by USACE. Water control management activities covered by this Manual include: data collection and handling; determination of project inflow; scheduling of releases; coordination of water management decisions; and determination of releases.

2.4.2.2 State

Oklahoma's Water Quality Standards - Oklahoma Administrative Code, Title 785, Chapter 45

This legislation establishes water quality standards promulgated by OWRB to promote and protect designated beneficial uses and to assure that degradation of existing quality of waters of the state does not occur.

Dams and Reservoirs - Oklahoma Administrative Code, Title 785, Chapter 25

This legislation sets forth minimum standards for construction and maintenance of dams based on size and hazard classification, application requirements for approval of plans and specifications, and inspection requirements, enforced by OWRB.

2.4.3 Existing Conditions (Water Supply, Flood Storage, and Operations)

Eufaula Lake is located on the Canadian River, 27 miles upstream from its confluence with the Arkansas River. It was created by impounding the Canadian River, North Canadian River, and several smaller creeks and provides flood control, water supply, hydroelectric power, fish and wildlife habitat, and recreation. Construction of Eufaula Dam was completed in 1964 and power generation began in the same year. Land and water resources at Eufaula Lake are managed by the Tulsa District of USACE in accordance with regulations governing Civil Works projects.

The dam is a rolled earth structure 3,200 feet long, including the spillway and powerhouse intake. The dam has a maximum height of 114 feet above the streambed. The spillway is a concrete weir with eleven 40- by 32-foot electrically-operated tainter gates. Spillway capacity at maximum pool is 465,000 cubic feet per second (cfs). Bank-full capacity below the dam is about 40,000 cfs, and capacity on the Arkansas River at Van Buren, Arkansas, is about 150,000 cfs. The outlet is a 5-foot 8-inch by 7-foot low-flow sluice passing through the left end of the spillway. The sluice intake invert is at elevation 500.0 feet above MSL, and flows are controlled by a hydraulically-operated gate. Capacity of the sluice at the top of the flood control pool is 2,400 cfs.

Eufaula Lake contains a total volume of 1,463,000 acre-feet (AF) of conservation storage, with a water supply storage of 56,000 AF per year (AFY) and a yield of 50 million gallons per day (MGD) (USACE 1994). OWRB issues water rights permits based on this yield, and USACE issues contracts for water supply usage. There is currently 26,000 AF of water storage not under contract with USACE (Stephens 2012).

Figure 2.4-1. Eufaula Dam

Surface water supplies, including reservoirs, are used to meet 88 percent of the water supply demand in the region around Eufaula Lake, with alluvial groundwater and bedrock groundwater supplying four and eight percent, respectively (OWRB 2012). By 2020, depletions of alluvial and bedrock groundwater storage may occur, placing more importance on surface water supplies such as that provided by Eufaula Lake. Regional water demand is estimated to increase by 36 percent (to 55,640 AFY) from 2010 to 2060, primarily from the municipal and industrial demand sector, but also from the crop irrigation and oil and gas demand sectors (OWRB 2012).

Flood storage is one of the multiple benefits provided by Eufaula Lake as part of the Arkansas River basin. The flood control storage area within the lake, or maximum elevation of the flood control pool, is 597 feet above MSL. This is 12 feet higher than the “normal” conservation pool elevation of 585 feet. The lake elevation is regulated such that the pool elevation does not exceed 600 feet (USACE 1994).

When floodwaters are being accumulated in the Arkansas River system, each lake in the system is regulated to retain equivalent flood control capabilities to the maximum extent possible (USACE 1994). Flood releases from Eufaula Lake are constrained by the channel capacity below the dam and the flood stage of the Arkansas River at Van Buren, Arkansas. Flood releases are made such that flows do not exceed 40,000 cfs and those flows specified at various locations by the Arkansas River Basin Water Control Master Manual.

2.5 Hazardous Materials

This section describes the existing conditions at Eufaula Lake with respect to hazardous materials.

2.5.1 Area of Analysis (Hazardous Materials)

The area of analysis for this section includes the lake and the adjacent USACE-owned lands surrounding the lakeshore that may be affected by federal management actions at the lake. The Carlton Landing study area includes the government lands, the private lands proposed for development, and any associated areas that might be affected by the development.

2.5.2 Regulatory Setting (Hazardous Materials)

2.5.2.1 Federal

EPA is the lead federal agency responsible for enforcing federal regulations regarding hazardous materials. The primary legislation governing hazardous materials includes the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Substances Control Act (TSCA).

Resource Conservation and Recovery Act

RCRA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste through comprehensive life cycle or "cradle to grave" tracking requirements. These include maintaining inspection logs of hazardous waste storage locations, records of quantities being generated and stored, and manifests of pick-ups and deliveries to licensed treatment/storage/disposal facilities. RCRA also identifies standards for treatment, storage, and disposal.

Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA, also known as Superfund, created a tax on the chemical and petroleum industries to provide for response and cleanup of hazardous substances that may endanger public health or the environment. CERCLA established requirements for abandoned hazardous waste sites and provided for liability of persons responsible for releases of hazardous waste at these sites.

Superfund Amendments and Reauthorization Act

SARA amended CERCLA to increase state involvement and required Superfund actions to consider state environmental laws and regulations. SARA also established a regulatory program for underground storage tanks (USTs) and the Emergency Planning and Community Right-to-Know Act (EPCRA).

Toxic Substances Control Act

TSCA established the mechanisms by which EPA tracks, screens, and tests industrial chemicals currently produced or imported into the United States that may pose an environmental or human health hazard. TSCA addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon, and lead-based paint.

Federal Occupational Safety and Health Act

The Occupational Safety and Health Administration (OSHA) administers the Federal Occupational Safety and Health Act which requires training of handlers of hazardous materials, notifying employees who work in the vicinity of hazardous materials, acquiring material safety data sheets which describe the proper use of hazardous materials, and training employees to remediate accidental releases of hazardous materials.

2.5.2.2 State

Oklahoma Environmental Quality Act, Oklahoma Environmental Quality Code 27A OS §1-1-101, et seq.

This statute established a single state agency, ODEQ, with responsibility for protecting human health and the natural environment, including air, water, and land. ODEQ authority includes the regulation of water quality (including stormwater), air quality, hazardous waste, and solid waste.

Oklahoma Hazardous Waste Management Act, Oklahoma Environmental Quality Code 27A O.S. § 2-7-101 et seq.

The Oklahoma Hazardous Waste Management Act provides ODEQ with the authority to administer the state program, including the statutory and regulatory provisions necessary to administer the provisions of RCRA, and designates ODEQ as the state agency to cooperate and share information with EPA for the purpose of hazardous waste regulation. The Oklahoma Environmental Quality Code ("Code"), at 27A O.S. Section 2-7-101 *et seq.* establishes the statutory authority to administer the Hazardous waste management program and subtitle C. The state regulations to manage the Hazardous waste management program are described in Oklahoma Administrative Code (OAC) Title 252 Chapter 205.

Oklahoma Emergency Response Act, Oklahoma Environmental Quality Code 27A-4-1-101 to 4-1- 106

The Oklahoma Emergency Response Act established the Oklahoma Hazardous Materials Emergency Response Commission (OHMERC), mandated under the 1986 Superfund Amendments and Reauthorization Act, Title III (SARA Title III). The Emergency Planning and Community Right to Know Act (EPCRA) as it is also known, requires the formation of Local Emergency Planning Committees (LEPCs). The Act establishes requirements for emergency planning, emergency release notification, hazardous chemical storage reporting requirements, and toxic chemical release inventory.

Oklahoma Administrative Code, Title 165, Oklahoma Corporation Commission

Chapter 10 (Oil and Gas Conservation) contains the rules pertinent to the oil and gas industries, including oil and gas drilling and disposal. Chapters 25 and 26 set forth the rules for petroleum underground storage tanks and aboveground storage tanks, respectively. These would apply to fuel storage tanks at Eufaula Lake marinas.

2.5.2.3 Local

Each county has a Local Emergency Planning Committee (LEPC), which is responsible for preparation and implementation of an emergency plan in accordance with SARA Title III and the EPCRA. The owner or operator of all facilities with storage of hazardous substances on-site must submit information on the types and quantities of hazardous substances annually to the OHMERC, the LEPC, and the local fire department.

2.5.3 Existing Conditions (Hazardous Materials)

Within the area of analysis, there are several potential sources of hazardous materials. These include marinas where fuels and oils are handled and stored. Oil and fuel spills could occur during fueling of boats or storage tanks. Hazardous and toxic substances can also be generated through the cleaning, painting, or repair of boats in the lake.

Hazardous materials are also used and stored at Eufaula power-generation facilities including the dam, powerhouse, transformer yard, switchyard, and operation and maintenance facility. These materials

include fuels, oils, paints, and solvents. Other materials used at Eufaula Lake include pesticides and herbicides. Light industrial and commercial sites near the lake use or store various hazardous materials and/or wastes (**Figure 2.5-1)**. Compliance with federal, state, and local regulations is required for use, storage, and disposal of hazardous chemicals. ODEQ has responsibility for overseeing the investigation and remediation of minor releases of hazardous materials that may occur at these sites. In addition, the LEPC and local fire departments maintain inventories of hazardous materials storage at facilities within the area of analysis in order to respond to emergency situations.

A long-term release of acid mine drainage from the Union Coal Company Mine No. 1, an abandoned coal mine, exists in the Gaines Creek drainage toward the southern portion of the area of analysis. Other underground coal mines also operated in this area from 1900 to 1930 (Cobbs 1979). The University of Oklahoma constructed a four-cell passive treatment wetlands system in the summer of 1998 to treat a portion of the acid mine drainage flow. The treatment wetlands have successfully improved water quality, decreasing the concentration of metals and increasing pH and alkalinity concentrations (Nairn 2003). ODEQ determined that this release did not warrant listing on the National Priorities List under CERCLA (Schrodt 2012).

Natural gas production is another potential source of hazardous materials within the area of analysis. Figure 3.4-3 in Chapter 3 of the Draft EIS shows the locations of natural gas wells on USACE lands around Eufaula Lake. Gas wells and associated pipelines located near the shoreline of Eufaula Lake have the potential to leak, allowing hazardous materials to be released into the lake. Landowners with mineral rights can apply to drill a well to extract mineral resources, following an environmental review and approval by USACE and BLM. Directional drilling is currently used to install new wells above the flood pool elevation to avoid flood waters coming into contact with the well facilities or associated pipelines.

During construction of new wells, there is the potential for hazardous materials releases, including drilling fluids and fuel for construction equipment. Typically, drilling fluids are contained in a lined waste containment and then removed upon well completion. Preparation of an Environmental Assessment (EA) is required to address potential environmental effects from new wells. The Oklahoma Corporation Commission regulates gas and oil wells (along with fuel storage tanks), including regular inspections and monitoring requirements.

In addition, major transportation corridors, including Interstate 40, U.S. Highway 69, and the Union Pacific Railroad traverse the area of analysis. There is potential for accidental releases of hazardous materials carried by trucks and/or railcars.

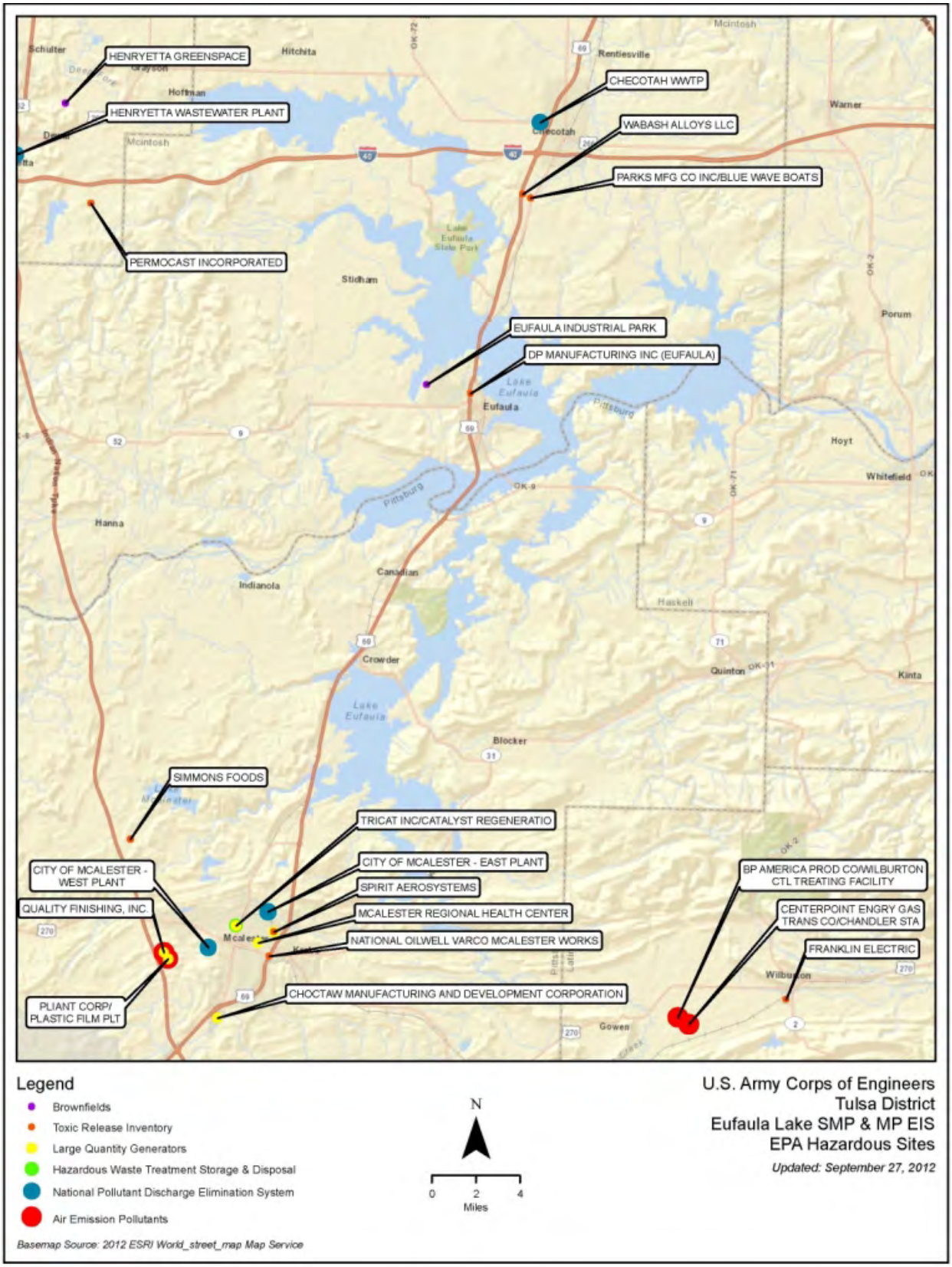


Figure 2.5-1. Hazardous Materials Sites near Eufaula Lake

2.6 Navigation

This section describes the regulatory setting and existing conditions related to navigation in Eufaula Lake. USACE does not conduct any activities specific to maintaining commercial or recreational navigation within Eufaula Lake.

2.6.1 Area of Analysis (Navigation)

The area of analysis for this section includes the lake and the adjacent lands surrounding the lakeshore.

2.6.2 Regulatory Setting (Navigation)

2.6.2.1 Federal

Rivers and Harbors Act of 1894, as amended, Title 33 of the United States Code (U.S.C.)

The Rivers and Harbors Act applies to activities within navigable waters of the U.S. Actions that may affect the navigability of waters of the U.S. such as bridge or causeway construction, aids to navigation, or dock construction are regulated under this Act.

Clean Water Act (CWA), as amended, (formerly known as Water Pollution Control Act), and implementing regulations, 33 U.S.C. 1344 et seq., 33 CFR 320 et seq.

Section 404 of the CWA authorized USACE to issue permits for the discharge of dredged or fill material into waters of the U.S.

2.6.3 Existing Conditions (Navigation)

Eufaula Lake is part of the McClellen-Kerr Arkansas River navigation system, which runs southeast through Oklahoma and Arkansas to the Mississippi River. As such, releases from Eufaula Lake are regulated to be consistent with the requirements of commercial navigation downstream. However, there is no water storage designated for navigation, and USACE does not conduct any activities specific to maintaining commercial navigation channels within the lake itself.

In addition, USACE does not maintain Eufaula Lake for recreational navigation. Private individuals can obtain permits from the USACE Regulatory Division under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act for dredging to maintain navigational boating access in areas where siltation has occurred. As described in the Master Plan, standard buoys are used as boat navigation aids within the lake to mark slow speed areas, hazard areas, and areas which are prohibited for boating (**Figure 2.6-1**).

Figure 2.6-1. Small Boat Navigation Aids in Eufaula Lake

2.7 Energy

This section describes energy resources and energy use at Eufaula Lake and in the surrounding counties.

2.7.1 Area of Analysis (Energy)

Population growth throughout the region as well as in the immediate vicinity of the Eufaula Lake would result in increased energy usage. As described in more detail below, measurements of population growth are based on the maximum potential development around the lake under each of the alternatives as well as the projected regional growth over the 10-15 year planning horizon. Thus, the area of analysis for energy resources is the four county region around Eufaula Lake including McIntosh, Haskell, Pittsburg, and Okmulgee Counties.

2.7.2 Regulatory Setting (Energy)

2.7.2.1 Federal

Section 403(b) of the Power Plant and Industrial Fuel Use Act of 1978 (P.L. 95-629) and Executive Order (EO) 12185, Conservation of Petroleum and Natural Gas (December 17, 1979, 44 F.R. §75093), encourage conservation of natural gas, among other energy resources.

USACE implements Environmental Management Systems in accordance with EO 13423 “Strengthening Federal Environmental, Energy, and Transportation Management” (January 26, 2007). This EO requires federal agencies to lead by example in advancing the nation’s energy security and environmental performance by achieving the following goals (EPA 2011):

- **Energy Efficiency:** Reduce energy intensity 30 percent by 2015, compared to an FY 2003 baseline.
- **Renewable Power:** At least 50 percent of current renewable energy purchases must come from new renewable sources (in service after January 1, 1999).

- **Building Performance:** Construct or renovate buildings in accordance with sustainability strategies, including resource conservation, reduction, and use; siting; and indoor environmental quality.
- **Vehicles**: Increase purchase of alternative fuel, hybrid, and plug-in hybrid vehicles when commercially available.
- **Petroleum Conservation:** Reduce petroleum consumption in fleet vehicles by 2 percent annually through 2015, compared to an FY 2005 baseline.
- **Alternative Fuel:** Increase use of alternative fuel consumption by at least 10 percent annually, compared to an FY 2005 baseline.

2.7.2.2 State

Subchapter 3 of Title 150, Chapter 80 of the Oklahoma Administrative Code (OAC) establishes the State Energy Conservation Program. Authorized under Title III, Parts C and D, as amended of the Energy Policy and Conservation Act (42 USC Sections 6321 *et seq.*) and the Department of Energy Organization Act (42 U.S.C. Sections 7101 *et seq.*), the purpose of the statute is to promote conservation of energy and reduce the rate of growth of energy demand for the state through the development and implementation of comprehensive state energy conservation programs (OAC 150:80-3-1). Oklahoma encourages the initiation of programs to conserve and improve energy efficiency as well as the use of renewable resources.

The State of Oklahoma passed the Energy Security Act in 2010 (House Bill 3028; codified OAC Title 17 Section 801.1). As stated in the law, it is the goal of the state to reduce dependence on foreign oil, expand development of domestic energy and renewable energy production, and to increase the ability to export the state's energy resources to the rest of the country. The bill sets annual renewable energy percentages for the state and promotes the development of natural gas resources.

Also in 2010, the Oklahoma State Senate passed House Bill 2973 (codified OAC Title 17 Section 160.11). This act is called the Oklahoma Wind Energy Development Act and it promotes the development of wind energy resources throughout the state.

2.7.3 Existing Conditions (Energy)

This section describes electricity and natural gas supplies and use in the region and study area.

2.7.3.1 Residential Electricity and Natural Gas Demand and Supply

The Oklahoma Corporation Commission regulates the prices and service reliability of several investor owned electricity and natural gas utilities serving the study area including Oklahoma Gas and Electric Company (OGE), Public Service Company of Oklahoma (PSO), CenterPoint Energy Company, and Oklahoma Natural Gas (ONG). In addition, the Oklahoma Corporation Commission regulates the service reliability only for Cookson Hills Electric Cooperative, East Central Electric Cooperative, and Kiamichi Electric Cooperative (Oklahoma Corporation Commission 2012). The Oklahoma Corporation Commission publishes the Electric System Planning Report, most recently published in 2008, which provides an overview of energy generation and projections for the state.

In addition to the Oklahoma Corporation Commission, the U.S. Energy Information Administration (EIA) maintains data on electricity and natural gas consumption for the utility companies serving the study area. **Table 2.7-1** summarizes electricity consumption for the year 2010 and **Table 2.7-2** summarizes natural gas consumption for the year 2010.

Table 2.7-1. Residential Electricity Consumption, 2010

Company	Ownership	Consumers	Consumption (Megawatt Hours)
Cookson Hills Electric Cooperative, Inc.	Cooperative	16,352	258,938
East Central Oklahoma Electric Cooperative, Inc.	Cooperative	27,984	412,938
Kiamichi Electric Cooperative, Inc.	Cooperative	18,640	254,818
Oklahoma Natural Gas and Electric	Investor Owned	614,181	8,759,063
Public Service Company of Oklahoma	Investor Owned	457,906	6,594,608

Source: U.S. EIA 2010a

Table 2.7-2. Residential Natural Gas Consumption, 2010

Company	Consumption (million cubic feet)
CenterPoint Energy	5,825,753
Oklahoma Natural Gas Company	56,057,275

Source: U.S. EIA 2010b

The Electric System Planning Report (Oklahoma Corporation Commission 2010) describes existing shortages of energy supply from in-state production. For 2008 and 2009, the electricity reserve margins of the state's largest providers were 0.34 percent below need and 5.97 percent above need, respectively. These numbers indicate that there was not sufficient generation capability to meet statewide peak demand without purchasing power or implementing demand reduction programs (Oklahoma Corporation Commission 2010). In addition to generating their own power, several providers within the state purchase power from outside of their generation systems. Purchases are made from the Southwestern Power Administration, a federal agency that markets power from hydroelectric projects, as well as from non-utility producers, such as those certified by the Federal Energy Regulatory Commission (FERC) as "Qualifying Facilities."

2.7.3.2 Residential Electricity and Natural Gas Projections

The Oklahoma Corporation Commission report includes electricity demand projections from 2010 through 2019. **Table 2.7-3** summarizes the projections from the Oklahoma Corporation Commision report. The table also illustrates the amount of power produced by the suppliers compared to the power purchased from outside sources as well as the net system demand when demand side management programs are taken into account.

Table 2.7-3. Projections of Maximum Electricity Demand, 2010 - 2019

Year	Generation Capacity (MW)	Purchased Power (MW)	Total Capacity	Peak Demand Forecast	Net System Demand [1] (MW)	Capacity Margin (MW)
2010	16,327	2,988	19,315	16,196	15,920	3,395
2011	16,443	2,898	19,341	16,480	16,146	3,195
2012	16,462	3,325	19,787	16,595	16,102	3,685
2013	16,480	3,385	19,866	16,869	16,256	3,610
2014	16,432	3,430	19,863	17,090	16,335	3,528
2015	16,537	3,340	19,877	17,258	16,459	3,418
2016	16,537	3,337	19,874	17,508	16,646	3,228
2017	16,796	3,390	20,186	17,756	16,877	3,309
2018	16,919	3,396	20,315	17,986	17,087	3,228
2019	16,919	3,399	20,319	18,228	17,324	2,994

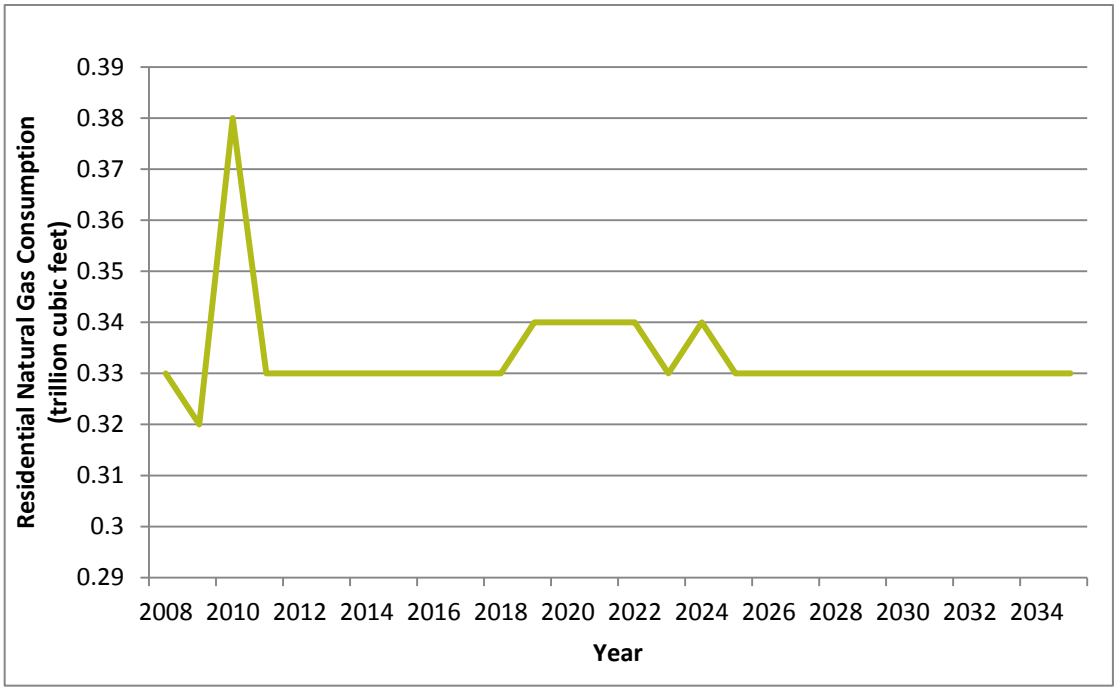
Source: Oklahoma Corporation Commission 2010.

Note: Data represents demand and capacity for the seven major electrical suppliers in the state.

1 – Net demand is peak demand minus the MW projected to be saved from implementation of demand side programs.

The projected growth rate in peak electricity demand is 12.55 percent, with an increase from 16,196 MW in 2010 to 18,228 MW in 2019. **Table 2.7-3** shows that electricity providers seem to be relying on purchased power more than generation increases to accommodate growth in demand; however, some companies have made additions to their systems. The Oklahoma Corporation Commission concludes that there will need to be major upgrades to the electric transmission system over the next decade. This is a result of aging existing facilities, increased electricity use by a growing population, and changes in national regulation of utilities (Oklahoma Corporation Commission 2010).

The U.S. EIA has developed projections of natural gas demand by U.S. Census region from 2008 through 2035. Oklahoma is located in the West South Central region. **Figure 2.7-1** illustrates projected changes in residential natural gas consumption in the region over the next 25 years.



Source: U.S. EIA 2011.

Figure 2.7-1. Projected Residential Natural Gas Consumption, West South Central Region (2008-2035)

The data represents U.S. EIA projections for the "reference" case, which is defined as the continuation of current laws and regulations remaining unchanged throughout the projected time period. The reference case provides the basis for examination and discussion of energy production, consumption, technology, and market trends and the direction they may take in the future. The data shows that, throughout the region (which includes Oklahoma, Arizona, Louisiana, and Texas), natural gas consumption is projected to remain somewhat consistent and to level off towards the end of the projection period.

2.8 Land Use Compatibility

A land use compatibility analysis was conducted to evaluate whether the action alternatives would be compatible with local land use plans, policies, and regulations given the potential growth inducing effects that could occur from revisions to the shoreline designations around the lake. This section identifies local land use planning occurring on land adjacent to Eufaula Lake.

2.8.1 Area of Analysis (Land Use Compatibility)

This analysis evaluates local land use plans, policies, and regulations in counties and municipalities adjacent to Eufaula Lake. Counties with land immediately adjacent to Eufaula Lake that may be affected by development patterns that could be influenced by revised shoreline allocations include Haskell, McIntosh, Muskogee, and Pittsburg Counties. Okmulgee and Latimer County were excluded because county land is not immediately adjacent to Eufaula Lake and the small amount of government land that extends into these counties is licensed to ODWC for wildlife management purposes. Incorporated municipalities with jurisdiction over lands adjacent to Eufaula Lake include Eufaula and Crowder.

2.8.2 Regulatory Setting (Land Use Compatibility)

Land resources at Eufaula Lake are managed in accordance with MP requirements described in ER 1130-2-550. All project lands are assigned categories which are used to determine appropriate uses for these lands. The SMP revision and MP supplement would include potential changes to shoreline designations, land classifications, and to vegetation management policies. Changes in shoreline designations could result in indirect effects from development activities on adjacent private lands.

NEPA requires an assessment of a project's potential impacts on adopted land use plans, policies, and regulations (40 CFR 1502.16). Local government zoning and land use plans may be more restrictive or prohibitive of land uses within the private properties adjacent to USACE-owned shoreline. To better integrate environmental impact statements into state or local planning processes, statements shall discuss any inconsistency of a proposed action with any approved state or local plan and laws. Where an inconsistency exists, the statement should describe the extent to which the agency would reconcile its proposed action with the plan or law (40CFR 1506.2(d)).

The following section includes a summary of existing land use plans, policies, and regulations for jurisdictions adjacent to Eufaula Lake.

2.8.3 Existing Conditions (Land Use Compatibility)

Counties that may be affected by development as a result of revised shoreline allocations include Haskell, McIntosh, Muskogee, and Pittsburg Counties. According to telephone communication with county staff, none of the counties have a comprehensive land use plan or policy (Brown 2012; Dawson 2012; Smith 2012, Ashmore 2012). Nor do the counties utilize land use controls including zoning ordinances, subdivision and land development regulations, or any other regulatory tool to prescribe and control land uses in the counties (Brown 2012, Dawson 2012, Smith 2012, Ashmore 2012). Zoning ordinances are typically used to assign a "zone" to parcels of land to describe the regulations under which that land may be used. Without zoning or any other policy or regulation to prescribe allowable land uses, land uses are unregulated in Haskell, McIntosh, Muskogee, and Pittsburg Counties. Therefore, there are no land use restrictions on county land near Eufaula Lake, including land at the Carlton Landing development in Pittsburg County.

Eufaula and Crowder are the only incorporated municipalities with jurisdiction over land adjacent to Eufaula Lake. Eufaula has a zoning ordinance, but there is no mechanism in place to regulate land uses in Crowder (Pennington 2012; Brooks 2012).

According to Pennington, City Planner at the City of Eufaula, Eufaula does not have a comprehensive land use plan or policy (Pennington 2012). Rather, planning, zoning, and development are regulated in Part 12 of the City Code (City of Eufaula 2012). Part 12 identifies allowable land uses and sets standards such as minimum lot size, maximum building heights, and set-back requirements. The areas adjacent to Eufaula Lake are zoned Residential 1 (R1), Residential 2 (R2), Residential 3 (R3), and Commercial (C1), representing the following districts (Pennington 2012):

- R1- Single-family residential district
- R2- Two-family residential district
- R3- Multiple-family residential
- C1- Commercial district

According to Brooks, Project Coordinator for Crowder, the town does not have a comprehensive land use plan or policy nor does it use zoning or any other land use control to regulate land uses (Brooks 2012). Land use in the town is primarily residential.

2.9 Public Infrastructure and Utilities

This section describes the existing public infrastructure and utilities within the vicinity of the study area. The public infrastructure discussed includes transportation: air, rail, roadway, transit and waterway; and potable water and wastewater systems. The utilities discussed include natural gas, electricity, and solid waste.

2.9.1 Area of Analysis (Public Infrastructure and Utilities)

The study area is the area within one mile of the government lands boundary around Eufaula Lake. However, the area of analysis includes the six counties that encompass Eufaula Lake: Haskell, Latimer, McIntosh, Muskogee, Okmulgee, and Pittsburg Counties as well as the 48 municipalities and 36 unincorporated areas within their borders. Changes to the SMP and MP could influence development patterns on private lands adjacent to the lake. These developments, which would be primarily residential, and their residents, would require public infrastructure and utilities. The infrastructure that supports residents and visitors at Eufaula Lake may be located outside of the study area within the counties that surround the lake. Therefore, this analysis considers public infrastructure located within the six counties that encompass the lake and that are likely to support lakeshore residents and visitors.

2.9.2 Regulatory Setting (Public Infrastructure and Utilities)

2.9.2.1 Federal

NEPA requires an evaluation of potential effects on the built environment (40 CFR 1502.16), which includes public infrastructure. The federal authorities that regulate transportation and utility infrastructure are the U.S. Department of Transportation (USDOT) and EPA, respectively. USACE has regulatory oversight over waterway infrastructure such as dams.

2.9.2.2 State

ODOT administers the programs and implements the regulations that affect the transportation infrastructure of the state. As described in Section 3.9 of the Draft EIS, ODOT prepares transportation plans and has responsibility for the design, construction, and maintenance of state roadways.

The Oklahoma Department of Environmental Quality (DEQ) monitors the solid waste industry within the state and regulates potable and wastewater facilities and systems. The regulatory framework for hazardous materials handling and water supply are described in Sections 2.5, Section 2.4, respectively, and water quality is described in Section 3.3 of the Draft EIS.

The Oklahoma Corporation Commission is the state regulatory agency focusing on public utilities (electric and gas as described in Section 2.7), except those under municipal or federal authority, and safety aspects of private transportation industries.

2.9.2.3 Local

Each municipality within the area of analysis has city or county departments or authorities which oversee water, wastewater and solid waste collection, and maintenance of local streets, alleys and right-of-ways. Development on private lands within the counties or cities adjacent to Eufaula Lake

2.9.3 Existing Conditions (Public Infrastructure and Utilities)

2.9.3.1 Airports

According to the Federal Aviation Administration (FAA), the study area is served by 12 airports open to the public (**Table 2.9-1**). These 12 airports are general aviation airports, which do not support commercial or military carriers, but rather personal and private business air travel. The closest commercial airport is Tulsa International Airport, located in Tulsa, Oklahoma, outside of the study area. These airports are shown in **Figure 2.9-1**. None of these airports are exceeding their capacity based on the volume of air traffic.

Table 2.9-1. Airports that Serve the Study Area

FAA Airport Code	Airport Name	Location
91F	Arrowhead Airport*	Canadian, Pittsburg County
MKO	Davis Field Airport	Muskogee, Muskogee County
F08	Eufaula Municipal Airport	Eufaula, McIntosh County
0F7	Fountainhead Lodge Airpark*	Eufaula, McIntosh County
2K9	Haskell Airport**	Haskell, Muskogee County
HAX	Hatbox Field Airport	Muskogee, Muskogee County
F10	Henryetta Municipal Airport	Henryetta, Okmulgee County
MLC	McAlester Regional Airport	McAlester, Pittsburg County
OKM	Okmulgee Regional Airport	Okmulgee, Okmulgee County
GZL	Stigler Regional Airport	Stigler, Haskell County
6F1	Talihina Municipal Airport	Talihina, Latimer County
H05	Wilburton Municipal Airport	Wilburton, Latimer County

**Owned by the USACE, operated by Oklahoma Tourism and Recreation Department*

*** Privately owned, but open to public use*

2.9.3.2 Rail

There are several railroad lines within the study area, the largest stretch being run by Union Pacific Railroad. **Figure 2.9-2** shows the railroad tracks within one mile of the government lands boundary surrounding Eufaula Lake. These tracks are still in active use for interstate freight movements.

2.9.3.3 Roadway

Interstate 40 is the only interstate highway within the study area, running east-west through the northern portion of the study area. Several U.S. and state highways crisscross the study area. **Figure 2.9-2** shows the major roadways within one mile of the government lands boundary surrounding Eufaula Lake. Information on roadway traffic can be found in Section 3.9 of the Draft EIS, Transportation.

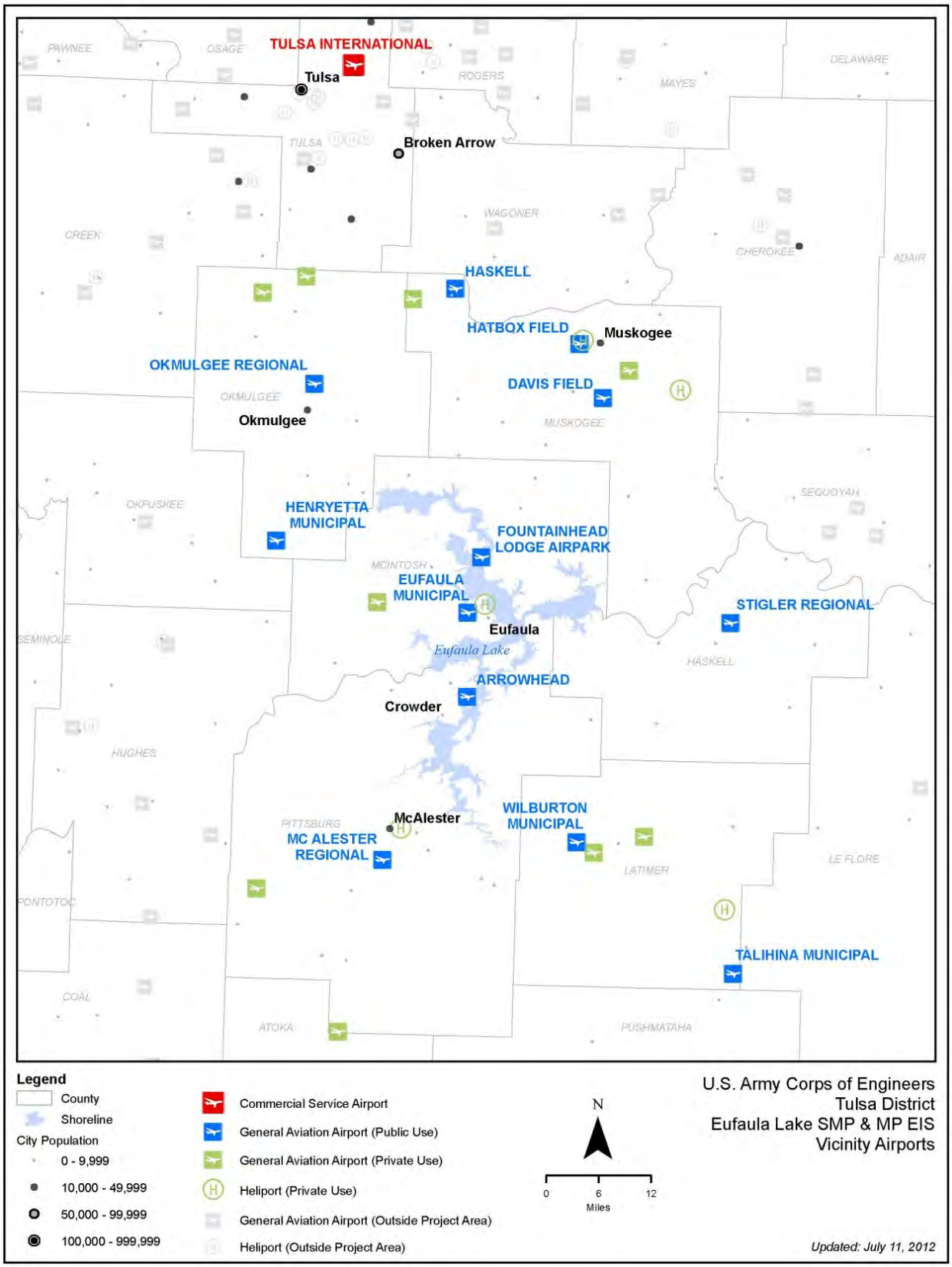


Figure 2.9-1. Airports Serving the Study Area

2.9.3.4 Transit

There are two transit service agencies within the study area: KI BOIS Area Transit System (KATS) and the Muskogee County Transit Authority (MCT). KATS operates in several counties within and around the study area including Haskell, Latimer, McIntosh, Okmulgee and Pittsburg. The KATS transit system is a bus and van demand-response service, or paratransit service, which has no fixed routes or schedules, but rather is on-call to those it serves. KATS operates its transit services Monday through Friday, 8:00 a.m. to 4:30 p.m.

MCT provides flexible fixed-route service in the City of Muskogee and demand-response service in the City and County of Muskogee. The city's provides flexible routes service Monday through Friday during the day and demand-response service Monday through Friday in the early evening and on Saturday during the daytime. The county demand-response service operates Monday through Friday, 8:00 a.m. to 3:00 p.m. The study area is outside of the city's service area and only a small portion of the study area would extend into the county's demand-response service area.

2.9.3.5 Intermodal Facilities

There are four intermodal facilities within the study area (**Table 2.9-2**). Intermodal facilities are places where freight is transferred from one mode of transport to another, such as from trucks to rail. There is one facility located within one mile of the government lands boundary of Eufaula Lake as shown on **Figure 2.9-2.**

Table 2.9-2. Intermodal Facilities Near Eufaula Lake

Facility Name	Type	Mode Type	City
Green Elevator	Rail	Rail and Truck	Checotah
The Hodges Companies-Okmulgee-OK	Rail	Rail and Truck	Okmulgee
Port of Keota	Port	Port and Truck	Haskell
Port of Muskogee	Port	Truck - Port - Rail	Muskogee

2.9.3.6 Dams

There are two USACE dam facilities within the study area (**Table 2.9-3** and **Figure 2.9-2**). The dams serve to provide flood control, water supply, hydroelectric power, and navigation benefits to the local area.

Table 2.9-3. Dams At and Near Eufaula Lake

County	Dam	River
McIntosh	Eufaula Lake	Canadian River
Muskogee	Webbers Falls Lock and Dam	Arkansas River

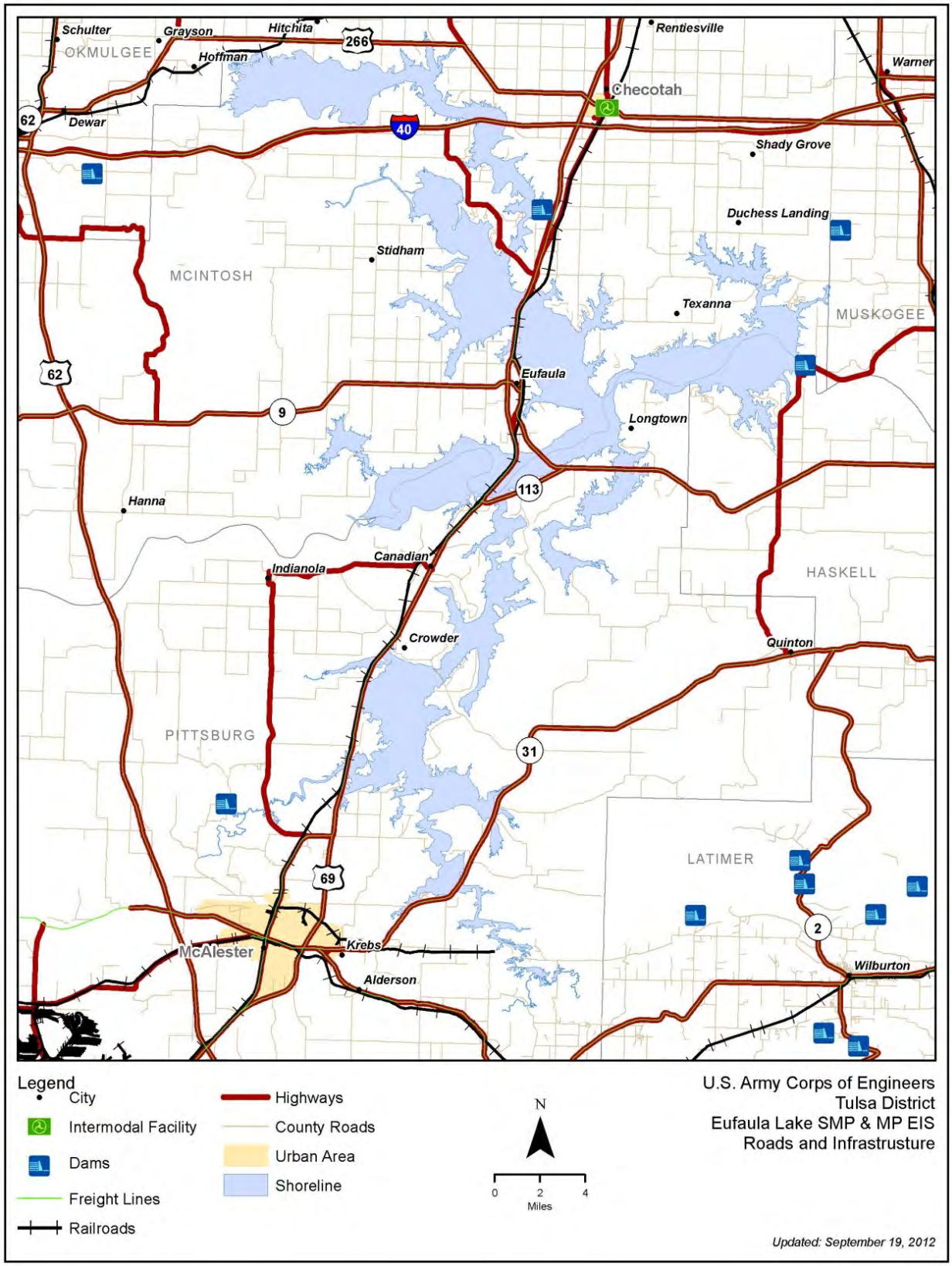


Figure 2.9-2. Transportation Infrastructure Serving the Study Area

2.9.3.7 Potable Water Systems

Table 2.9-4 shows the number of rural water providers within each county of the study area. These water providers serve relatively small areas or clusters of developments. Individual residences outside of the service area of these rural water providers would need to draw drinking water from surface water or ground water sources through a water right issued by ODEQ.

Table 2.9-4. Water Systems that Serve the Study Area

County	Number of Systems
Haskell	4
Latimer	6
McIntosh	10
Muskogee	18
Okmulgee	13
Pittsburg	17
TOTAL	**68**

Figure 2.9-3 shows the water systems and their facilities, including water towers and wells, that serve the areas within one mile of the government lands boundary of Eufaula Lake. For more information regarding water quality refer to Section 3.3 of the Draft EIS and to Section 2.4 for water supply.

2.9.3.8 Wastewater Systems

According to information provided by the Oklahoma Center for Geospatial Information, there are more than 30 wastewater service providers within the study area (**Table 2.9-5**). **Figure 2.9-3** shows the treatment plants and other wastewater treatment facilities that would serve the areas within one mile of the government lands boundary of Eufaula Lake.

Table 2.9-5. Wastewater Providers that Serve the Study Area

County	Name	Utility Size
Haskell	Haskell County Rural Water District	Small
Haskell	Keota Public Works Authority	Small
Haskell	McCurtain Municipal Authority	Small
Haskell	Stigler Municipal Improvement Authority	Medium
Latimer	City of Wilburton	Medium
Latimer	Red Oak Public Works Authority	Small
McIntosh	Checotah Public Works Authority	Medium
McIntosh	Eufaula Public Works Authority	Medium
McIntosh	Tanglewood Bluff Wastewater Treatment	Small
Muskogee	Braggs Public Works Authority	Small
Muskogee	City of Porum	Small
Muskogee	Fort Gibson Utility Authority	Medium
Muskogee	Haskell Public Works Authority	Small
Muskogee	Muskogee Municipal Authority	Medium
Muskogee	Town of Boynton	Small

County	Name	Utility Size
Muskogee	Town of Oktaha	Small
Muskogee	Town of Webbers Falls	Small
Muskogee	Warner Utilities Authority	Small
Okmulgee	Beggs Public Works Authority	Small
Okmulgee	City of Okmulgee	Medium
Okmulgee	Dewar Public Works Authority	Small
Okmulgee	Henryetta Municipal Authority	Medium
Pittsburg	Canadian Public Works Authority	Small
Pittsburg	Crowder Public Works Authority	Small
Pittsburg	City of Hartshorne	Small
Pittsburg	City of Quinton	Small
Pittsburg	City of McAlester	Medium
Pittsburg	Haileyville Public Works Authority	Small
Pittsburg	Krebs Utility Authority	Small
Pittsburg	Pittsburg Public Works Authority	Small
Pittsburg	Savanna Public Works Authority	Small
Pittsburg	Town of Alderson	Small

2.9.3.9 Solid Waste Facilities

According to ODEQ, there are four landfills, all municipal solid waste landfills, and four transfer stations within the study area (**Table 2.9-6**). **Figure 2.9-3** shows the solid waste facilities that would serve the areas within one mile of the Eufaula Lake government lands boundary.

Table 2.9-6. Landfills that Serve the Study Area

County	Municipal Solid Waste	Industrial Hazardous Waste	Transfer Station	Anticipated Closure (Year)
Haskell	0	0	1	N/A
Latimer	0	0	0	-
McIntosh	0	0	2	N/A
Muskogee	1*	0	0	2024
Okmulgee	1	0	1	Unavailable
Pittsburg	2*	0	0	2011; 2039
TOTAL	**4**	**0**	**4**	

**Also accepts non-hazardous industrial waste*

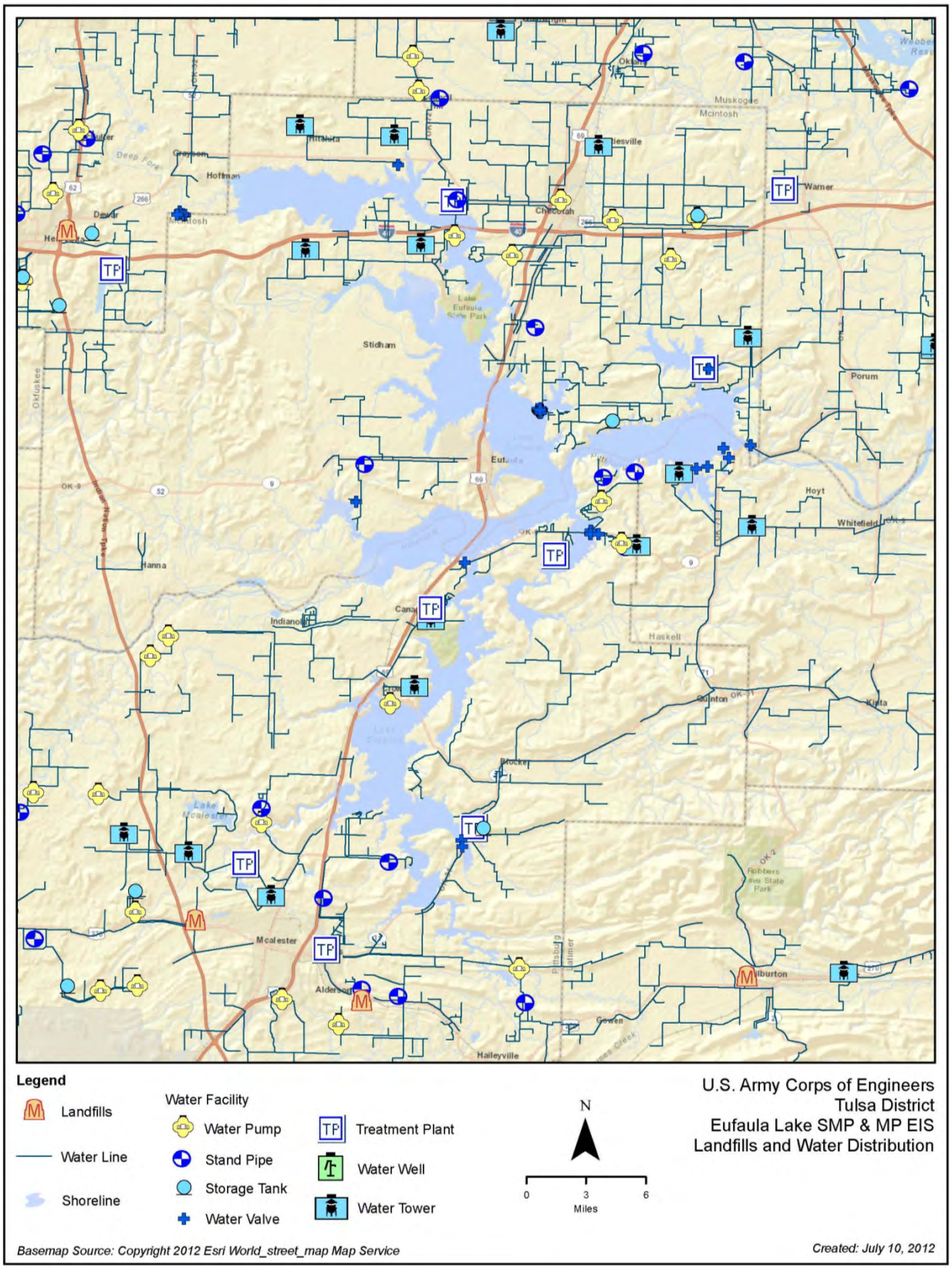


Figure 2.9-3. Water, Wastewater, and Solid Waste Facilities Serving the Study Area

2.10 Social Services and Community Facilities

This section describes the existing social services and community facilities, such as education, public safety, and health care that serve residents and visitors to the study area.

2.10.1Area of Analysis (Social Services and Community Facilities)

The study area is the area within one mile of the government lands boundary around Eufaula Lake. However, the area of analysis includes the six counties that encompass Eufaula Lake: Haskell, Latimer, McIntosh, Muskogee, Okmulgee, and Pittsburg Counties as well as the 48 municipalities and 36 unincorporated areas within their borders. The social services and community facilities that support residents and visitors at Eufaula Lake may be located outside of the study area within the counties that surround the lake. Therefore, this analysis considers facilities located within the six counties that encompass the lake and that are likely to support lakeshore residents and visitors.

2.10.2Regulatory Setting (Social Services and Community Facilities)

2.10.2.1 Federal

The National Environmental Policy Act of 1969, as amended, (NEPA), mandates that federal agencies ensure that a balance is achieved "between population and resource use which will permit high standards of living and a wide sharing of life's amenities" (42 USC 4331[b][5]). An area's social services and community facilities are considered an indicator of a region's quality of life, and therefore should be analyzed as part of the federal NEPA requirements.

2.10.2.2 State

Oklahoma state agencies such as the Oklahoma State Board of Education, Department of Public Libraries, Public Safety Department, and the Department of Health monitor and oversee the social and community facilities within the state. However, there are no state regulations or policies governing environmental impacts on social services and community facilities

2.10.2.3 Local

There are no local or regional policies or regulations that focus on social services and community facilities.

2.10.3Existing Conditions (Social Services and Community Facilities)

2.10.3.1 Education

There are 48 school districts within the six counties of the study area. These districts include 122 public schools. According to the Oklahoma State Department of Education, total school enrollment in the study area is 35,946 students. **Table 2.10-1** lists the school districts and their enrollments for the 2011-2012 school year. The school districts range in size from 77 students in the Ryal School District to 6,279 students in the Muskogee School District. Just two school districts, the Muskogee and McAlester School Districts, account for 25 percent of the total student population.

Table 2.10-1. Public School Districts and 2011 through 2012 Enrollment

School Districts	County	Grade Level(s)	Enrollment
Keota	Haskell	PK-12	414
Kinta	Haskell	PK-12	195
McCurtain	Haskell	PK-12	246
Stigler	Haskell	PK-12	1,327
Whitefield	Haskell	PK-08	130
Buffalo Valley	Latimer	PK-12	177
Panola	Latimer	PK-12	236
Red Oak	Latimer	PK-12	243
Wilburton	Latimer	PK-12	956
Checotah	McIntosh	PK-12	1,638
Eufaula	McIntosh	PK-12	1,260
Hanna	McIntosh	PK-12	310
Midway	McIntosh	PK-12	210
Ryal	McIntosh	PK-08	77
Stidham	McIntosh	PK-08	161
Braggs	Muskogee	PK-12	198
Fort Gibson	Muskogee	PK-12	1,867
Haskell	Muskogee	PK-12	882
Hilldale	Muskogee	PK-12	1,790
Muskogee	Muskogee	PK-12	6,279
Oktaha	Muskogee	PK-12	746
Porum	Muskogee	PK-12	494
Wainwright	Muskogee	PK-08	135
Warner	Muskogee	PK-12	698
Webbers Fall	Muskogee	PK-12	283
Beggs	Okmulgee	PK-12	1,228
Dewar	Okmulgee	PK-12	439
Henryetta	Okmulgee	PK-12	1,303
Morris	Okmulgee	PK-12	1,031
Okmulgee	Okmulgee	PK-12	1,579
Preston	Okmulgee	PK-12	585
Schulter	Okmulgee	PK-12	192
Twin Hills	Okmulgee	PK-08	365
Wilson	Okmulgee	PK-12	264
Canadian	Pittsburg	PK-12	438
Crowder	Pittsburg	PK-12	487
Frink-Chambers	Pittsburg	PK-08	444
Haileyville	Pittsburg	PK-12	393
Hartshorne	Pittsburg	PK-12	868
Haywood	Pittsburg	PK-08	120
Indianola	Pittsburg	PK-12	235
Kiowa	Pittsburg	PK-12	286

School Districts	County	Grade Level(s)	Enrollment
Krebs	Pittsburg	PK-08	362
McAlester	Pittsburg	PK-12	3,049
Pittsburg	Pittsburg	PK-12	160
Quinton	Pittsburg	PK-12	595
Savanna	Pittsburg	PK-12	395
Tannehill	Pittsburg	PK-08	176

In addition, there are three private K-12 schools located within the study area: Marian Academy in Okmulgee, Boulevard Christian School in Muskogee, and Agape Christian Academy in Muskogee.

The Carlton Landing Academy opened in August 2012 as a public school in the Canadian District with a pre-K through Grade 5 program for the 2012-2013 school year.

Figure 2.10-1 shows the 71 schools, both public and private, that serve the areas within one mile of the government lands boundary of Eufaula Lake.

2.10.3.2 Higher Education

There are seven colleges and universities located within the six counties of the study area (**Table 2.10-2**).

Table 2.10-2. Colleges and Universities

Name	City	County
Bacone College	Muskogee	Muskogee
Connors State College (CSC)	Warner	Muskogee
CSC - Muskogee Branch Campus	Muskogee	Muskogee
Eastern Oklahoma State College (EOSC)	Wilburton	Latimer
EOSC - McAlester Branch Campus	McAlester	Pittsburg
Northeastern State University - Muskogee Branch Campus	Muskogee	Muskogee
Oklahoma State University - Institute of Technology	Okmulgee	Okmulgee

Figure 2.10-1 shows the four colleges and universities that serve the areas within one mile of the government lands boundary of Eufaula Lake.

2.10.3.3 Libraries

The 13 public libraries within the six counties of the study area are located within several library system service areas. Haskell, Latimer, and Pittsburg Counties are located within the Southeastern Public Library System of Oklahoma. McIntosh and Muskogee Counties are served by the Eastern Oklahoma District Library System. The libraries within Okmulgee County are not affiliated with a regional library system. **Table 2.10-3** lists these 13 libraries and their locations.

Figure 2.10-1 shows the eight libraries that serve the area within one mile of the government lands boundary of Eufaula Lake.

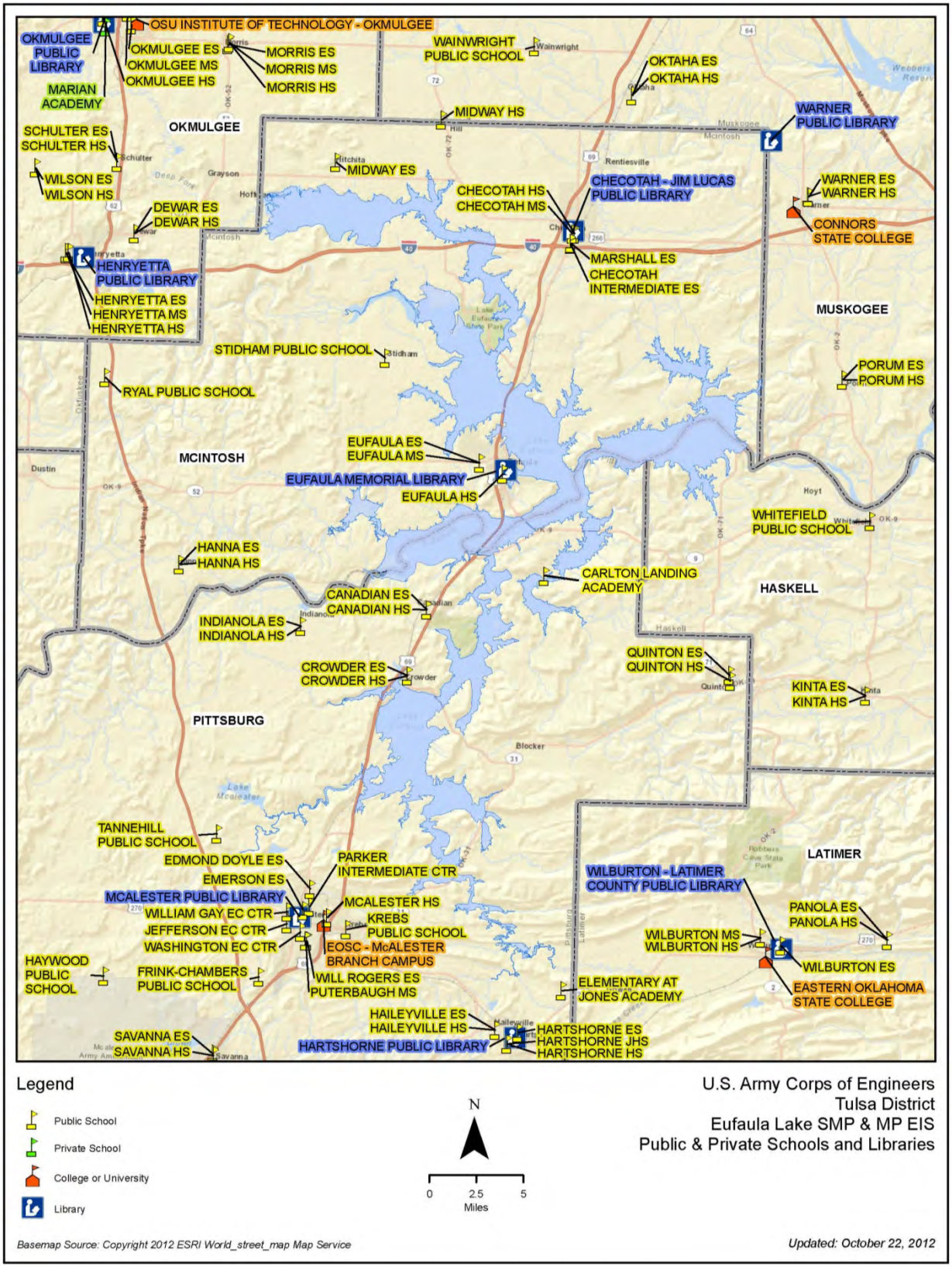


Figure 2.10-1. Educational Facilities that Serve the Study Area

Table 2.10-3. Libraries

Library	City	County
Stigler Public Library	Stigler	Haskell
Wilburton - Latimer County Public Library	Wilburton	Latimer
Checotah – Jim Lucas Checotah Public Library	Checotah	McIntosh
Eufaula Memorial Library	Eufaula	McIntosh
Eastern Oklahoma Library District Admin	Muskogee	Muskogee
Ft. Gibson - Q.B. Boydstun Library	Ft. Gibson	Muskogee
Haskell - Rieger Memorial Library	Haskell	Muskogee
Muskogee Public Library	Muskogee	Muskogee
Warner Public Library	Warner	Muskogee
Henryetta Public Library	Henryetta	Okmulgee
Okmulgee Public Library	Okmulgee	Okmulgee
Hartshorne Public Library	Hartshorne	Pittsburg
McAlester Public Library	McAlester	Pittsburg

2.10.3.4 Public Safety

There are 116 fire stations located within the six counties of the study area. **Table 2.10-4** shows the total number of fire stations within each of the counties.

Table 2.10-4. Fire Stations

County	Fire Stations
Haskell	11
Latimer	10
McIntosh	25
Muskogee	18
Okmulgee	17
Pittsburg	35
Total	**116**

Each county within the study area has its own County Sherriff's Office, as well as at least one municipal police department. The number of law enforcement departments within each county is shown in **Table 2.10-5**.

Table 2.10-5. Sheriff and Police Departments

County	Sherriff's and Police Departments
Haskell	4
Latimer	2
McIntosh	3
Muskogee	7
Okmulgee	6
Pittsburg	7
TOTAL	**29**

There are 12 correctional facilities located within the six counties of the study area, as listed in **Table 2.10-6**.

Table 2.10-6. Correctional Facilities

Name	City	County
Haskell County Jail	Stigler	Haskell
Latimer County Jail	Wilburton	Latimer
McIntosh County Jail	Eufaula	McIntosh
Dr. Eddie Warrior Correctional Center	Taft	Muskogee
Jess Dunn Correctional Center	Taft	Muskogee
Muskogee Community Corrections Center	Muskogee	Muskogee
Muskogee County Detention Center	Muskogee	Muskogee
Okmulgee County Jail	Okmulgee	Okmulgee
Jackie Brannon Correctional Center	McAlester	Pittsburg
Oklahoma State Penitentiary	McAlester	Pittsburg
Pittsburg County Juvenile Detention Center	McAlester	Pittsburg
Pittsburg County Jail	McAlester	Pittsburg

Figure 2.10-2 shows the fire stations, police stations, and correctional facilities near Eufaula Lake including those within one mile of the government land boundaries around the lake.

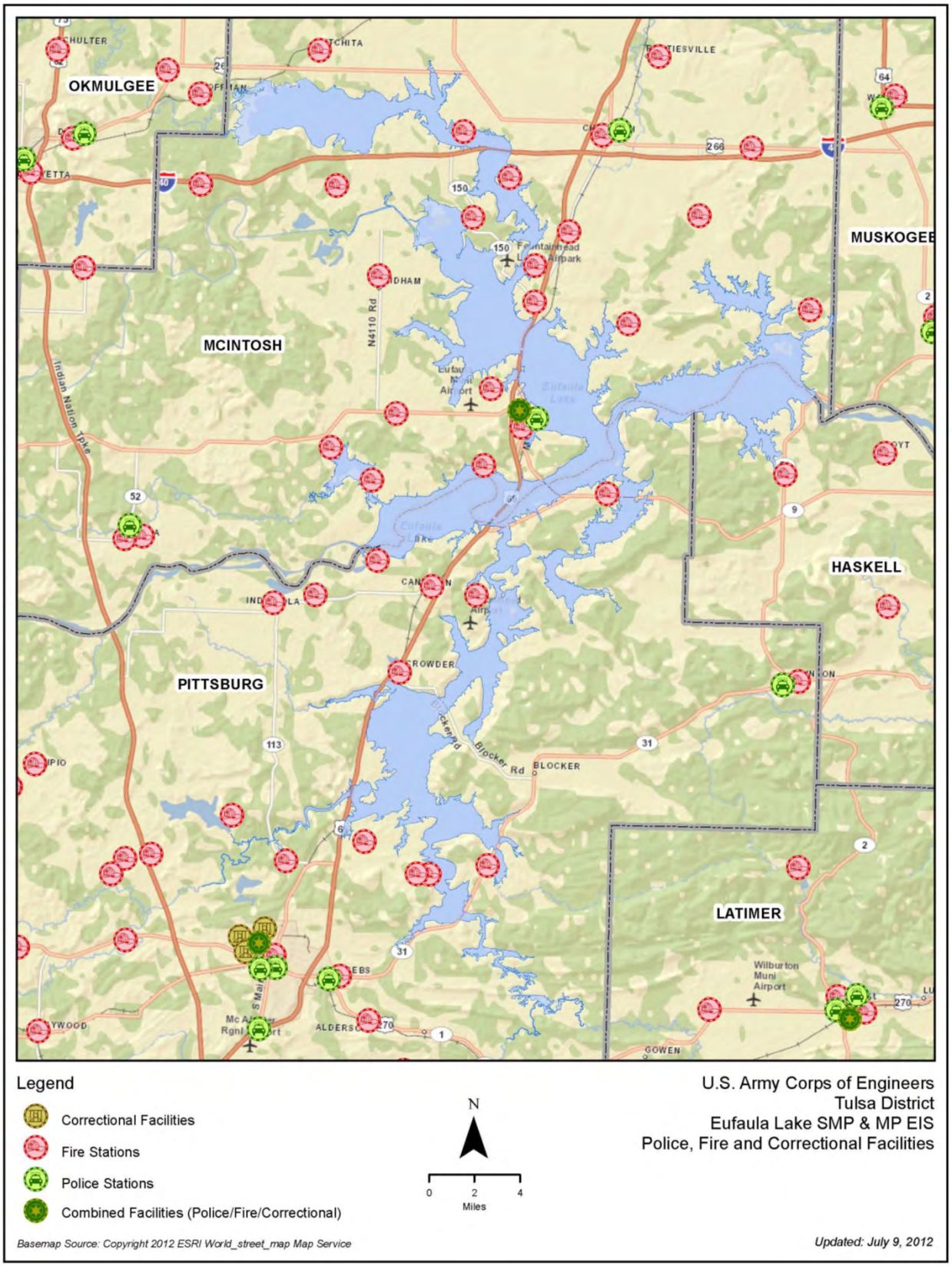


Figure 2.10-2. Public Safety Facilities

2.10.3.5 Medical Care

Within the six counties of the study area there are 15 hospitals and medical centers, several of which, including Epic Medical Center in Muskogee and Okmulgee Memorial Hospital, have emergency care capabilities (**Table 2.10-7**).

Table 2.10-7. Hospitals and Medical Centers

Name	Emergency Services	Number of Beds	City	County
Haskell County Community Hospital	Yes	25	Stigler	Haskell
Choctaw Nation Health Clinic	No	N/A	McAlester	Pittsburg
Choctaw Nation Health Clinic	No	N/A	Stigler	Haskell
Latimer County General Hospital	No	24	Wilburton	Latimer
Epic Medical Center	Yes	33	Eufaula	McIntosh
Jack C. Montgomery VA Medical Center	No	111	Muskogee	Muskogee
Muskogee Community Hospital	Yes	45	Muskogee	Muskogee
Muskogee Regional Medical Center	Yes	275	Muskogee	Muskogee
Solara Hospital of Muskogee	No	46	Muskogee	Muskogee
Henryetta Medical Center	Yes	41	Henryetta	Okmulgee
Okmulgee Memorial Hospital	Yes	66	Okmulgee	Okmulgee
George Nigh Long Term Acute Care Hospital	No	4	Okmulgee	Okmulgee
George Nigh Rehabilitation Center	No	26	Okmulgee	Okmulgee
Carl Albert Community Mental Health Center	No	15	McAlester	Pittsburg
McAlester Regional Health Center	Yes	171	McAlester	Pittsburg

Figure 2.10-3 shows the medical facilities that serve the area within one mile of the government land boundaries of Eufaula Lake.

Figure 2.10-3. Medical Facilities that Serve the Study Area

2.11 Environmental Justice

This section defines environmental justice and describes the existing conditions of environmental justice populations within the study area.

2.11.1Area of Analysis (Environmental Justice)

The area of analysis includes the six counties encompassing Eufaula Lake: Haskell, Latimer, McIntosh, Muskogee, Okmulgee, and Pittsburg, and the 16 census tracts within one mile of the government lands boundary of Eufaula Lake. As of June 2012, census tracts are the smallest geographic unit available for 2010 U.S. Census poverty data. Therefore, to be consistent, census tracts are the smallest unit used for both minority and low-income populations in the environmental justice analysis.

2.11.2Regulatory Setting (Environmental Justice)

2.11.2.1 Federal

Executive Order 12898 (EO 12898), *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Council on Environmental Quality (CEQ) issued *Environmental Justice - Guidance under the National Environmental Policy Review Act* in 1997 to provide guidance on the implementation of EO 12898.

CEQ guidance defines “minority” as non-white or Hispanic and defines the population of an affected area as a minority population when the total minority percentage in the affected area exceeds 50 percent or “is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.”

Low-income populations, according to the CEQ guidance, are identified based on poverty thresholds used by the U.S. Census Bureau. The U.S. Census Bureau defines poverty as income below $22,811 for a family of four with two children under the age of 18.

2.11.2.2 State

The State of Oklahoma does not have any agencies or policies specifically concerned with environmental justice issues pursuant to EO 12898 implementation.

2.11.2.3 Local

There are no local or regional agencies or policies that focus on environmental justice concerns.

2.11.3Existing Conditions (Environmental Justice)

2.11.3.1 Minority

The U.S. and the State of Oklahoma have a minority population (those who self-report as non-white or Hispanic) of 36.3 percent and 31.3 percent, respectively. The minority population within the six counties surrounding the study area is 34.7 percent, which is higher than the state but lower than the nation as a whole (**Table 2.11-1**).

Table 2.11-1. Summary of Minority Populations by Nation, State, and County

Geographic Area	Population	Minority Population (%)
U.S.	308,745,538	36.3
Oklahoma	3,751,351	31.3
County		
Haskell County	12,769	26.7
Latimer County	11,154	30.8
McIntosh County	20,252	30.6
Muskogee County	70,990	41.7
Okmulgee County	40,069	35.6
Pittsburg County	45,837	28.1
County Total	**201,071**	**34.7**

The total population within the 16 census tracts of the study area is 62,795. Of these 16 census tracts, eight tracts were determined to have minority populations equal to or above that of the state overall. One census tract was determined to have a minority rate equal to that of the nation overall. **Figure 2.11-1** shows the census tracts and their respective minority rates. However, the average minority population across the census tracts is 29.3 percent, which is lower than that in the state and nation as a whole.

Table 2.11-2 shows the racial minority makeup of the census tracts within the study area versus that of the state as a whole.

Table 2.11-2. Minority Population of the Census Tracts within the Study Area as Compared to the State

Geographic Area	Total Minority Population (%)	Population by Race and Ethnicity (%)						
		African American	American Indian and Alaska Native	Asian	Native Hawaiian and Pacific Islander	Other	Two or More Races	Hispanic
Oklahoma	31.3	7.4	8.6	1.7	0.1	4.1	5.9	8.9
Total Census Tracts	29.3	2.0	17.5	0.3	0.0	0.5	8.1	2.1

An individual within the study area is less likely to be a racial minority than within the state as a whole (29.3 versus 31.3 percent). However, within the study area, an individual is more likely to be of two or more races, and is considerably more likely to be American Indian and Alaska Native than within the state as a whole.

2.11.3.2 Low-Income Populations

According to the 2010 U.S. Census, the State of Oklahoma has a higher proportion of its population living in poverty than the nation overall (16.8 and 15.3 percent, respectively). The average poverty rate in the six counties encompassing the study area is 19.4 percent, which is higher than both the state and the nation.

Accordingly, the average median household income in the six counties is $35,738, which is lower than the state ($42,076) and nation ($50,046) as a whole.

Table 2.11-3 shows the percentage of the population living below the poverty level and the median household income for the United States, Oklahoma, and the six counties of the study area.

Table 2.11-3. Summary of Poverty Rate and Median Household Income by Nation, State, and County

Geographic Area	Population	Poverty Rate (%)	Median Household Income ($)
U.S.	308,745,538	15.3	50,046
Oklahoma	3,751,351	16.8	42,076
County			
Haskell County	12,769	17.5	38,528
Okmulgee County	40,069	21.4	32,551
Latimer County	11,154	17.8	38,154
McIntosh County	20,252	20.0	33,771
Muskogee County	70,990	20.6	35,306
Pittsburg County	45,837	18.8	36,119
County Total	**201,071**	**18.4**	**35,738***

**Average*

Figure 2.11-2 shows the poverty rate and median household income in the census tracts of the study area. Eleven of the 16 study area census tracts have poverty rates greater than the state overall (16.8 percent). Overall, the poverty rate in the census tracts of the study area averages to 18.8 percent, which is higher than the state and nation. Three of the 16 census tracts have a median household income greater than the state as a whole ($42,076), but none of the three are greater than the nation as a whole. The average median household income across the study area is $34,282, considerably lower than the state and nation overall.

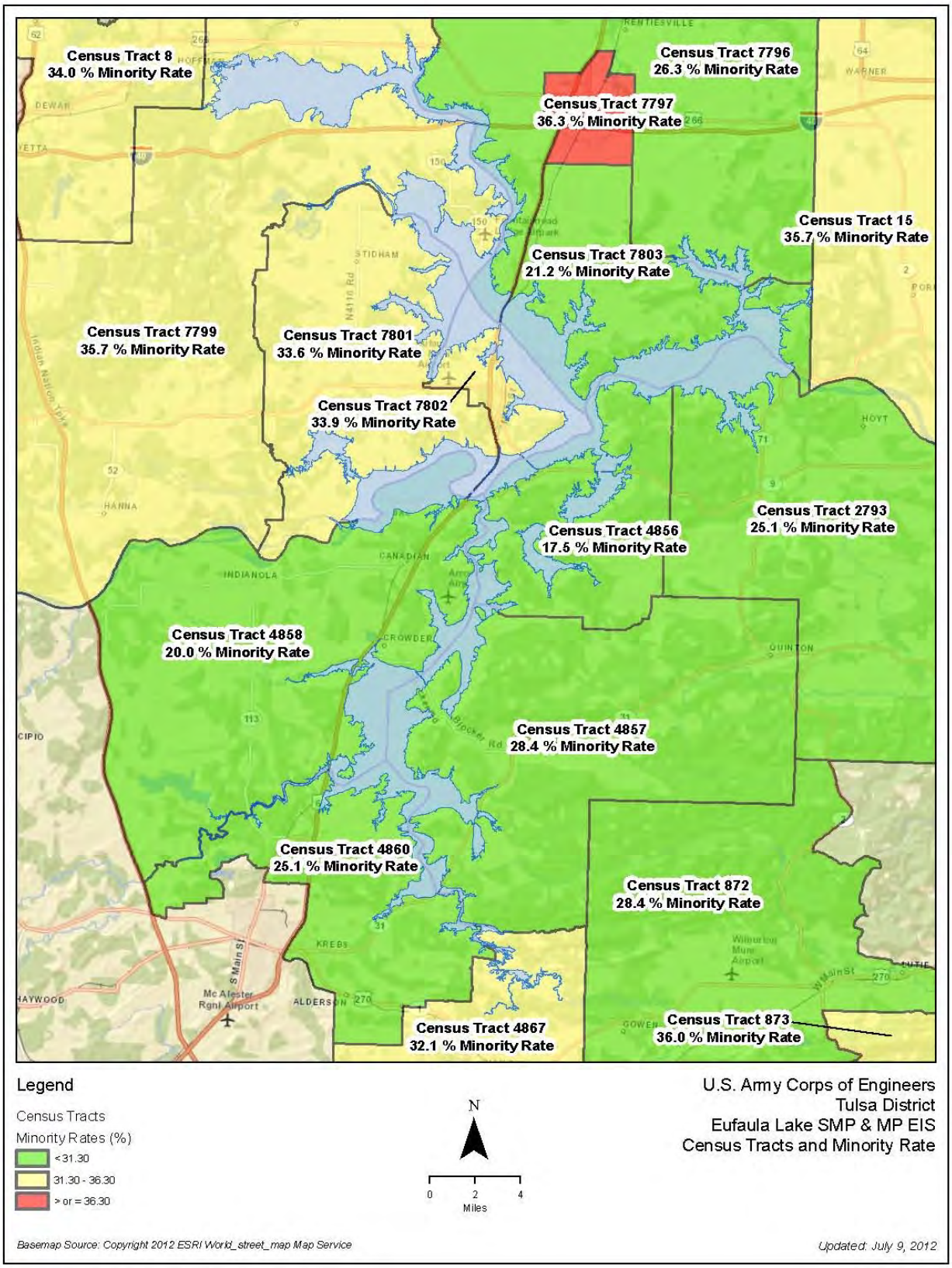


Figure 2.11-1 Minority Rates within the Census Tracts of the Study Area per 2010 U.S. Census Data

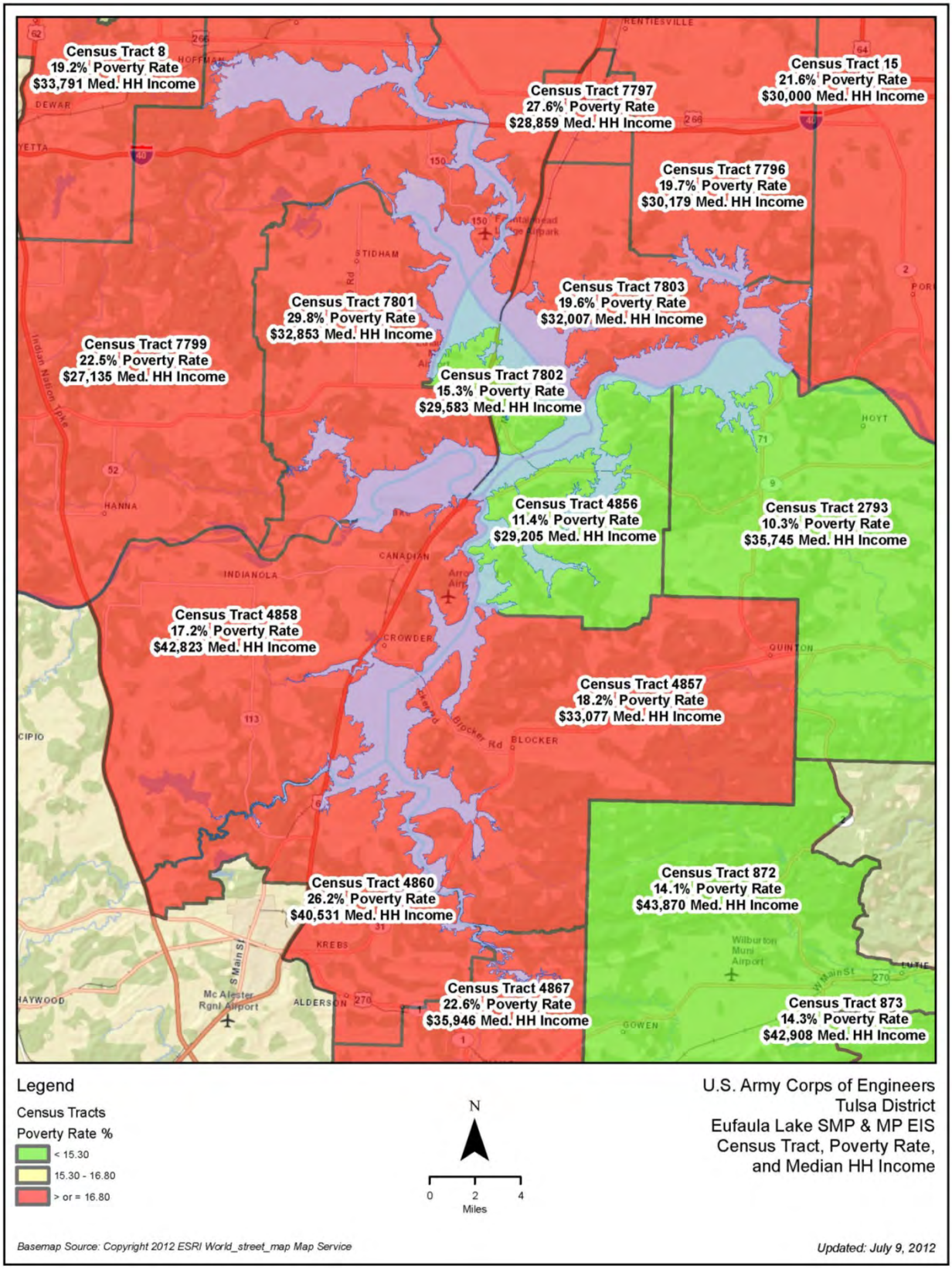


Figure 2.11-2. Poverty Rate and Median Household Income within the Census Tracts of the Study Area per 2010 U.S. Census Data

Section 3

Environmental Consequences

This section evaluates the potential direct and indirect impacts related to the No Action Alternative and each of the four action alternatives for the resource categories described in Section 1.

The federal action under consideration is primarily a planning and zoning action. The alternatives vary with respect to shoreline allocations, vegetation management, and consideration of specific zoning requests that, in turn, determine the potential number of private docks that could be built on the lake and the condition of the natural vegetation and habitats along the lakeshore. The alternatives would each have different buffer width ranges so there would be the potential for differential impacts.

Indirect effects also result from implementation, but are later in time or farther removed in distance, while still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. For example, alternatives that allow for private docks would have the indirect effect of attracting residential development to the private lands adjacent to the government lands where private docks could be constructed. Therefore, the amount of Limited Development shoreline could have an indirect effect on resources through this influence on the location of residential development.

To determine the significance of impacts, the severity of the potential impact is examined in terms of the type, quality and sensitivity of the resource involved, the duration of the effect (short- or long-term) and other considerations of context.

3.1 Agricultural Lands

There are agricultural lands and agricultural leases on USACE-owned lands around Eufaula Lake. The action alternatives would not result in direct impacts to agricultural lands. However, there is the potential for indirect impacts as a result of changes in shoreline allocations. As private lands adjacent to the government lands develop into residential uses, there is the potential for some agricultural land to convert to non-agricultural uses. The amount and location of shoreline allocated to Limited Development which allows the construction of boat docks and private lake access may influence the amount and location of residential development on adjacent private lands.

3.1.1 Assessment Methods (Agricultural Lands)

The potential magnitude of possible differences between alternatives in the amount of new residential development on private lands adjacent to government lands around the lake is related to differences between alternatives in the amount of shoreline allocated to Limited Development. Increases in the amount of adjacent residential development could result in conversion of agricultural lands to non-agricultural uses. The shoreline around Carlton Landing was also evaluated for the presence of prime farmlands because development of public recreation facilities along the shoreline could directly affect the potential for agricultural uses in that location.

The proposed changes to the vegetation management policies would not affect agricultural uses and not considered further. Vegetation management would not affect the potential for suitable soils to be used for agriculture and shoreline permits for vegetation management are not related to agricultural uses.

3.1.2 Significance Criteria (Agricultural Lands)

Impacts on agricultural land could be considered potentially significant if changes in shoreline allocations would directly or indirectly:

- Affect the agricultural leases on USACE land around the lake
- Result in the permanent conversion of prime farmland to non-agricultural uses; or
- Result in permanent changes in land use patterns to ones that are incompatible with agricultural operations.

3.1.3 No Action Alternative (Agricultural Lands)

Under the No Action Alternative there would be no changes to existing shoreline allocations or vegetation management policies. Additionally, MP land use classification maps would not be revised to be consistent with the 1998 SMP shoreline allocations. The proposed lease for a public marina and other public recreational facilities at Carlton Landing would not be granted under the No Action Alternative, and no individual requests to change shoreline allocations would be granted. None of the existing agricultural leases on USACE land would change under the No Action Alternative. However, as there are currently 271 miles of shoreline allocated to Limited Development, there is the potential for more residential development adjacent to USACE land and for the conversion of agricultural lands to non-agricultural uses. This potential is greater for areas in the north and east portions of the lake where there are more soils classified as prime farmland (*e.g.*, north and east of Deep Fork Arm, inland from the Belle Starr area, around Porum Landing, and near Brooken Cove).

3.1.3.1 Potential Impacts

The No Action Alternative would not result in changes to existing shoreline designations, land use classifications, or make any changes to the existing agricultural leases around the lake; thus, there would be no impacts to agricultural uses on USACE-owned lands around Eufaula Lake.

Under the No Action Alternative, the existing 271 miles of Limited Development shoreline are not fully developed with private docks and there is the potential for up to 8,746 docks to be constructed at the lake. There are currently 1,673 private docks on the lake, which means that 52 miles of shoreline are currently committed to private shoreline uses. Therefore, there are approximately 109 miles of shoreline left under the Limited Development allocation that would be potentially available for new private dock construction (*i.e.,* 219 miles divided by 2 to conform with the regulation that limits dock construction to 50 percent of the allocated shoreline).

Using the historical rate of growth in shoreline use permits for private docks, it is estimated that the number of private docks could reach 2800 docks over the next 20 years. This would be equivalent to a commitment of almost 87 miles of shoreline to private uses. Another method of calculating potential growth is to use the historical residential growth rate of 3 subdivisions per year with a total of approximately 123 lots per year. Over the next 20 years, this would result in 2,460 new lots, not all of which would be waterfront lots with docks. However, consistent with historical development patterns in

the study area, it is reasonable to assume that many of those potential subdivisions would be sited adjacent to the lake in order to take advantage of the amenities offered by lake access and the potential for private or community docks.

There are prime farmlands near the government lands around Eufaula Lake. Prime farmland soils are more common to the north and east of the lake than other parts of the lake, and there are Limited Development allocated shorelines in these areas. Given that new residential development near the lake is more likely to occur adjacent to shorelines allocated to Limited Development, there is the potential for new residential development to be sited on prime farmland soils close to the lakeshore and there would be the potential for adverse impacts.

New residential development constructed to take advantage of the shoreline zoning would be located adjacent to the lake and would likely be similar in character existing developments. Given that the number of farms is generally increasing in the six county region around Eufaula Lake, it is unlikely that additional residential development adjacent to the lake would create a pattern of land uses incompatible with continued agriculture. Therefore, although there could be a loss of some prime agricultural soils, there would not be a significant impact on agricultural resources.

Proposed Carlton Landing Development

Under the No Action Alternative, there would be no change in the shoreline allocations or land use classifications near Carlton Landing. In addition, no lease agreement would be granted for the construction of a public marina and other public recreation facilities at Carlton Landing. There is a small area of prime farmland on Roundtree Landing, and although the area is classified as High Density Recreation, it would still be managed as Future/Inactive Recreation and would not be developed. Therefore, there would be no impact to prime farmlands in this location.

As described in Chapter 2, there would still be some limited residential development constructed on the adjacent private lands at Carlton Landing. There is no prime farmland on the private lands at Carlton Landing; therefore, there would be no impacts from the No Action Alternative.

3.1.4 Alternative 1 (Agricultural Lands)

Alternative 1 would result in a greatly reduced number of Limited Development shoreline miles and corresponding Low Density Recreation land use classification acres. The MP land use classification maps would be revised to be consistent with the SMP shoreline allocations under this alternative. Alternative 1 includes implementation of the extended vegetation management zones. Finally, the shoreline allocation at Carlton Landing would not be changed and the lease request for a public marina and other recreational amenities at Carlton Landing would not be granted. The MP would be revised to be consistent with the SMP, which would mean that the current High Density Recreation classification would be changed to Future/Inactive Recreation.

3.1.4.1 Direct Impacts

Under Alternative 1, the reduction in Limited Development shoreline allocation would not make any changes to the existing agricultural leases around the lake; thus, there would be no direct impacts to agricultural uses on USACE-owned lands around Eufaula Lake.

Proposed Carlton Landing Development

Under Alternative 1, there would be no change in the shoreline allocations near Carlton Landing. In addition, no lease agreement would be granted for the construction of a public marina and other public recreation facilities at Carlton Landing. There is a small area of prime farmland on Roundtree Landing, and the land classification would be revised to Future/Inactive Recreation and it would not be developed. Therefore, there would be no impact to prime farmlands in this location.

Individual Zoning Requests

The individual zoning requests that may be approved under Alternative 1 include zoning requests 4, 5, 6, and 10. Each of these requests is to maintain an area of Limited Development shoreline as Limited Development. Under Alternative 1, none of these zoning requests would be granted and each of these areas would be revised to Protected shoreline. There would be no direct impacts to land designated as prime farmland from these zoning actions. Prime farmlands would not be permanently converted to another use and no incompatible uses would be created. There would be no direct impact to agricultural resources.

3.1.4.2 Indirect Impacts

Under Alternative 1, the amount of Limited Development shoreline would be greatly reduced from 271 miles under the No Action Alternative to 42 miles. Under Alternative 1, approximately 2,278 docks could potentially be built, which represents about 605 new docks. Under Alternative 1, there would be approximately 9 miles of shoreline where new docks could be constructed. While there would continue to be an incentive to site potential subdivisions adjacent to the lake, the areas where new docks could be constructed would be extremely limited. Therefore, there would not be an adverse indirect effect on agricultural resources.

Proposed Carlton Landing Development

Under Alternative 1, there would still be some limited residential development constructed on the adjacent private lands at Carlton Landing. There is no prime farmland on the private lands at Carlton Landing; therefore, there would be no indirect impacts from Alternative 1.

Individual Zoning Requests

The areas included in the individual zoning requests under Alternative 1 are already developed in residential land uses and while the shoreline allocation would change, the existing land uses on the adjacent private lands would not. Therefore, there would be no indirect impacts to prime farmland or agricultural uses.

3.1.5 Alternative 2 (Agricultural Lands)

Alternative 2 would also result in a reduction of Limited Development shoreline miles and corresponding Low Density Recreation land use classification acres. The MP land use classification maps would be revised to be consistent with the SMP shoreline allocations under this alternative. Finally, the shoreline allocation at Carlton Landing would not be changed and the lease request for a public marina and other recreational amenities at Carlton Landing would not be granted.

3.1.5.1 Direct Impacts

Under Alternative 2, the reduction in Limited Development shoreline allocation would not make any changes to the existing agricultural leases around the lake; thus, there would be no direct impacts to agricultural uses on USACE-owned lands around Eufaula Lake.

Proposed Carlton Landing Development

Under Alternative 2, there would be no change in the shoreline allocations near Carlton Landing. In addition, no lease agreement would be granted for the construction of a public marina and other public recreation facilities at Carlton Landing. There is a small area of prime farmland on Roundtree Landing, and the land classification would be revised to Future/Inactive Recreation and it would not be developed. Therefore, there would be no impact to prime farmlands in this location.

Individual Zoning Requests

There are no individual zoning requests proposed for consideration under Alternative 2.

3.1.5.2 Indirect Impacts

Under Alternative 2, there would be 182 miles of Limited Development shoreline, which would allow for the construction of more docks on the lake than currently exist. The existing docks result in a commitment of 52 miles of shoreline to private docks, which would leave approximately 65 miles of shoreline under the Limited Development allocation that would be potentially available for new private dock construction (*i.e.,* 130 miles divided by 2 to conform with the regulation that limits dock construction to 50 percent of the allocated shoreline).

Docks may be built by the owners of residential lots on adjacent private lands. It is reasonable to assume that most residential lots would be associated with Limited Development shorelines and sited adjacent to the lake in order to take advantage of the amenities offered by lake access and the potential for private or community docks. There are prime farmlands near the government lands. Prime farmland soils are more common to the north and east of the lake than other parts of the lake, and there would be Limited Development allocated shorelines in these areas. Given the potential for new residential development to occur in response to the availability of shorelines allocated to Limited Development, there is the potential for new residential development to be sited on prime farmlands and there would be the potential for an indirect impact.

Although, there is the potential for more residential development to be constructed adjacent to shorelines designated as Limited Development, this potential development would be located adjacent to the lake and would likely be similar in character existing developments. Given that the number of farms is generally increasing in the six county region around Eufaula Lake, it is unlikely that residential development adjacent to the lake would create a pattern of land uses incompatible with continued agriculture. Therefore, there would not be a significant impact on agricultural resources.

Proposed Carlton Landing Development

Under Alternative 2, there would still be some limited residential development constructed on the adjacent private lands at Carlton Landing. There is no prime farmland on the private lands at Carlton Landing; therefore, there would be no indirect impacts from Alternative 2.

3.1.6 Alternative 3 (Agricultural Lands)

Alternative 3 would result in an increase in the number of miles allocated to Limited Development and acres classified as Low Density Recreation. Compared to existing conditions, there would be a 35 percent increase in Limited Development shorelines. The MP land use classifications would be revised to be consistent with the SMP shoreline allocations. In addition, the Carlton Landing shoreline allocations would be changed from Protected to Limited Development. The lease request for the public marina and other public recreational facilities on the shoreline at Carlton Landing would not be granted.

3.1.6.1 Direct Impacts

Under Alternative 3, Protected shorelines that are not adjacent to lands that are encumbered by a lease or license agreement (and that are suitable for dock construction and maintenance) would be converted to Limited Development shoreline allocations. Therefore, areas with existing agricultural leases would not be changed under Alternative 3. Therefore, there would be no direct impacts to agricultural uses on USACE-owned lands around Eufaula Lake.

Proposed Carlton Landing Development

While the increase in Limited Development allocations on the north side of Longtown Arm would allow for some additional dock construction and boating access compared to the No Action Alternative, the number of boats that could be accommodated would be limited and the scale and extent of development at Carlton Landing would be similar to that under the No Action Alternative. The land use classification of the government lands would be changed to Low Density Recreation. However, this would not allow the construction of public recreational facilities on the government lands. While there is a small patch of prime farmland on Roundtree Landing, this area is not adjacent to private land and private docks would not be allowed to be constructed in this location. Therefore, there would be no impact to prime farmlands in this location.

Individual Zoning Requests

Only individual Zoning Request #8 would be considered under Alternative 3, which would convert Protected shoreline areas to Limited Development. There would be no potential direct impacts to prime farmland on government lands from this zoning action.

3.1.6.2 Indirect Impacts

Under Alternative 3, there would be 367 miles of Limited Development shoreline, which would allow for the construction of more docks on the lake than currently exist. The existing docks result in a commitment of 52 miles of shoreline to private docks, which would leave approximately 157 miles of shoreline under the Limited Development allocation that would be potentially available for new private dock construction (*i.e.,*. 315 miles divided by 2 to conform with the regulation that limits dock construction to 50 percent of the allocated shoreline).

Docks may be built by the owners of residential lots on adjacent private lands. It is reasonable to assume that most residential lots would be associated with Limited Development shorelines and sited adjacent to the lake in order to take advantage of the amenities offered by lake access and the potential for private or community docks. There are prime farmlands near the government lands. Prime farmland soils are more common to the north and east of the lake than other parts of the lake, and there would be Limited Development allocated shorelines in these areas. Given the potential for new residential development to occur in response to the availability of shorelines allocated to Limited Development, there is the potential

for new residential development to be sited on prime farmlands and there would be the potential for an indirect impact.

Although, there is the potential for more residential development to be constructed adjacent to shorelines designated as Limited Development, this potential development would be located adjacent to the lake and would likely be similar in character existing developments. Given that the number of farms is generally increasing in the six county region around Eufaula Lake, it is unlikely that residential development adjacent to the lake would create a pattern of land uses incompatible with continued agriculture. Therefore, there would not be a significant impact on agricultural resources.

Proposed Carlton Landing Development

Under Alternative 3, there would still be some limited residential development constructed on the adjacent private lands at Carlton Landing. There is no prime farmland on the private lands at Carlton Landing; therefore, there would be no indirect impacts from Alternative 3.

Individual Zoning Requests

Under Alternative 3, only zoning request #8 would be approved. Although the upland development under zoning request #8 is planned to comprise 680 acres, there is very little prime farmland in this area. Therefore, there would not be a significant impact to agricultural resources under Alternative 3.

3.1.7 Alternative 4 (Agricultural Lands)

Alternative 4 would increase Limited Development shoreline allocations by converting all Protected areas that do not have an existing license agreement for use of the government shoreline to Limited Development. The MP land use classification maps would be revised to be consistent with the SMP shoreline. In addition, the Carlton Landing shoreline area allocations would be changed from Protected to Public Recreation, and the lease request for the public marina and other public recreational facilities on the government shorelines at Carlton Landing would be granted.

3.1.7.1 Direct Impacts

Under Alternative 4, Protected shorelines that are not adjacent to lands that are encumbered by a lease or license agreement (and that are suitable for dock construction and maintenance) would be converted to Limited Development shoreline allocations. Therefore, areas with existing agricultural leases would not be changed under Alternative 4. Therefore, there would be no direct impacts to agricultural uses on USACE-owned lands around Eufaula Lake.

Proposed Carlton Landing Development

The USACE-owned shoreline along Carlton Landing and to the north of the proposed development would be changed from Protected to Public Recreation. While there is a small patch of prime farmland on Roundtree Landing located in the area proposed for a group camp, the area is small and isolated. There are no other prime farmlands at Carlton Landing; therefore, there would be no direct impacts on agricultural resources.

Individual Zoning Requests

The individual zoning requests that may be approved under Alternative 4 include zoning requests 2, 3, 8, and 9. These requests would convert Protected shoreline areas to Limited Development. Zoning requests 3 and 9 are within the corporate limits of Eufaula and are lands committed to uses other than agriculture. Zoning Request #8 is in an area with very little prime farmland and Zoning Request #2 is in an area with

some small patches of prime farmland mixed into a larger matrix of non-prime farmland. There would be no potential direct impacts prime farmland on government lands from these zoning actions.

3.1.7.2 Indirect Impacts

Under Alternative 4, there would be 479 miles of Limited Development shoreline, which would allow for the construction of more docks on the lake than currently exist. The existing docks result in a commitment of 52 miles of shoreline to private docks, which would leave approximately 213 miles of shoreline under the Limited Development allocation that would be potentially available for new private dock construction (*i.e.,* 427 miles divided by 2 to conform with the regulation that limits dock construction to 50 percent of the allocated shoreline).

Docks may be built by the owners of residential lots on adjacent private lands. It is reasonable to assume that most residential lots would be associated with Limited Development shorelines and sited adjacent to the lake in order to take advantage of the amenities offered by lake access and the potential for private or community docks. There are prime farmlands near the government lands. Prime farmland soils are more common to the north and east of the lake than other parts of the lake, and there would be Limited Development allocated shorelines in these areas. Given the potential for new residential development to occur in response to the availability of shorelines allocated to Limited Development, there is the potential for new residential development to be sited on prime farmlands and there would be the potential for an indirect impact.

Although, there is the potential for more residential development to be constructed adjacent to shorelines designated as Limited Development, this potential development would be located adjacent to the lake and would likely be similar in character to existing developments. Given that the number of farms is generally increasing in the six county region around Eufaula Lake, it is unlikely that residential development adjacent to the lake would create a pattern of land uses incompatible with continued agriculture. Therefore, there would not be a significant impact on agricultural resources.

Proposed Carlton Landing Development

Under Alternative 4, the full development at Carlton Landing would proceed as described in Chapter 2. Full build out would include residential and mixed-use development over most of the 1,650 acre master plan area. There is no prime farmland on the private lands at Carlton Landing; therefore, there would be no indirect impacts from Alternative 4. In addition, development at Carlton Landing would not result in development patterns incompatible with agricultural land uses, and the development is not adjacent to exiting agricultural uses. Therefore, there would be no indirect impacts from Alternative 4.

Individual Zoning Requests

The individual zoning requests that may be approved under Alternative 4 include zoning requests 2, 3, 8, and 9. These requests would convert Protected shoreline areas to Limited Development. Zoning requests 3 and 9 are within the corporate limits of Eufaula and are lands committed to uses other than agriculture. Zoning Request #8 is in an area with very little prime farmland and Zoning Request #2 is in an area with some small patches of prime farmland mixed into a larger matrix of non-prime farmland. There would be no potential indirect impacts to prime farmland on government lands from these potential zoning actions.

3.1.8 Potential Mitigation Measures (Agricultural Lands)

There would be no significant impacts to agricultural resources under the No Action Alternative or any of the action alternatives; therefore, no mitigation measures are proposed for agricultural resources.

3.2 Air Quality

3.2.1 Assessment Methods (Air Quality)

This air quality analysis provides a qualitative assessment of air emissions relative to the various alternatives proposed for the revisions to the SMP and MP supplement. A qualitative analysis is sufficient because the proposed alternatives have low potential for air emission impacts. No direct air quality impacts from changes to shoreline allocations would occur; however, indirect air quality impacts from construction, development, and recreational activities allowed as a result of changes to shoreline designations would vary for each alternative. A qualitative analysis provides a basis for identifying and comparing the potential differences among air emissions, if any, from the various alternatives proposed for revisions to the SMP. The MP would be supplemented to be consistent with the SMP so potential impacts would be the same as described for the proposed SMP revisions.

3.2.2 Significance Criteria (Air Quality)

An action is considered significant under NEPA if it causes or contributes to ambient air concentrations that exceed a NAAQS. Potentially adverse impacts may occur if project emissions exceed a NAAQS. Therefore, for the purpose of this study, the alternatives would create an adverse effect if activities on government lands directly related to the action would exceed a NAAQS. In the absence of quantitative analysis, project alternatives must involve activities with high potential for air quality effects to exceed a NAAQS given that the Eufaula Lake study area is currently in attainment for all seven criteria pollutants.

3.2.3 No Action Alternative (Air Quality)

There would be no direct or indirect impacts to air quality under the No Action Alternative. Under the No Action Alternative, there would be no change to the existing shoreline designations, none of the pending rezone requests would be granted, there would be no change to vegetation management policies, and the lease agreement required for the construction and operation of the proposed public recreational facilities at Carlton Landing would not be granted. The minimal amount of construction that would occur at Carlton Landing would not result in emissions that would exceed the NAAQS. Other residential development around the lake adjacent to shorelines allocated to Limited Development would be unlikely to exceed historical rates which have not resulted in emissions that exceed the NAAQS. Therefore, there would be no increase in air emissions due to increased transportation, recreation, construction, or building operation activities. Thus, the No Action Alternative would not result in an adverse effect on air quality. No mitigation would be required.

3.2.4 Alternative 1 (Air Quality)

There would be no direct impacts and no indirect adverse air quality impacts under Alternative 1. Alternative 1 includes the shoreline allocations as they existed under the 1981 SMP before the area of Limited Development was significantly expanded in subsequent revisions. Limited Development areas not designated as Limited Development in the 1981 SMP would be converted to Protected, none of the pending zoning requests would be granted that involve a change in shoreline allocation, and the lease agreement required for the construction and operation of the proposed public recreation facilities at Carlton Landing would not be granted.

Under Alternative 1, only 605 new private docks would be allowed on the lake, thus limiting potential development density and creating a disincentive for adjacent residential development. Therefore, air emissions resulting from construction and development activities associated with Limited Development

areas would decrease as a result of Alternative 1. Land access and boating would still be permitted on Protected areas, and Public Recreation shoreline areas would remain the same as in the No Action Alternative. Therefore, air emissions from recreational activities, including mobile emissions from vehicles commuting to the Eufaula Lake and watercraft activities, would not increase as a result of Alternative 1.

There would be no increase in air emissions due to increased transportation, recreation, construction, or building operation activities. Thus, Alternative 1 would not result in an adverse effect on air quality. No mitigation would be required.

3.2.5 Alternative 2 (Air Quality)

There would be no direct impacts and no indirect adverse air quality impacts under Alternative 2. Alternative 2 would reduce the amount of Limited Development area compared to the No Action Alternative by converting Limited Development areas that are unsuitable for docks and which do not have existing developments adjacent to the government shoreline to Protected. The pending zoning requests that involve a change in shoreline allocation and the lease agreement required for the construction and operation of the proposed public recreational facilities at Carlton Landing would not be granted.

Alternative 2 would result in a decrease in Limited Development shorelines and a corresponding increase in Protected shorelines. Protected shoreline areas limit development and private activities such as the mooring or construction of privately owned floating facilities. Typically, a change from Limited Development to Protected would result in a decrease in construction and development activities. However, many of the areas that would be converted to Protected from Limited Development include those which are unsuitable for dock development and which would have been less likely to experience development pressure and recreational activities such as boating that would result in air emissions even under the No Action Alternative.

The minimal amount of construction that would occur at Carlton Landing would not result in emissions that would exceed the NAAQS. Other residential development around the lake adjacent to shorelines allocated to Limited Development would be unlikely to exceed historical rates which have not resulted in emissions that exceed the NAAQS. Therefore, there would be no increase in air emissions due to the indirect effects on construction and development activities of Alternative 2.

Land access and boating would still be permitted on Protected areas, and Public Recreation shoreline areas would remain the same as in the No Action Alternative. Therefore, air emissions from recreational activities, including mobile emissions from vehicles commuting to the Eufaula Lake and from watercraft activities, would not increase as a result of Alternative 2. Thus, Alternative 2 would not result in an adverse effect on air quality. No mitigation would be required.

3.2.6 Alternative 3 (Air Quality)

There would be no direct impacts and minor indirect adverse air quality impacts under Alternative 3. Alternative 3 would increase the amount of Limited Development shoreline compared to the No Action Alternative by converting Protected areas that are suitable for docks and which do not have an existing lease agreement for use of the government shoreline to Limited Development. The Carlton Landing shoreline areas would be changed from Protected to Limited Development, but the lease request for a public marina and other public recreation facilities at Carlton Landing would not be granted. There would be a minimal change to the amount of shoreline miles designated as Public Recreation and no change to Prohibited allocations.

An increase in the amount of Limited Development areas that are suitable for docks would increase the area that could potentially support residential development and construction of additional docks. Dock construction would result in construction emissions from construction vehicles and equipment and construction employee commuting. Additional boating access would result in mobile air emissions from increased vehicle transportation to Eufaula Lake and from increased watercraft use. Construction emissions would occur only in areas where construction is taking place, would be temporary in nature, and would be controlled by standard fugitive dust mitigation techniques. The increase in development activities would likely be insignificant, and, as a result, it is not anticipated that Alternative 3 would lead to an increase in air emissions beyond the significance thresholds for air quality. Therefore, Alternative 3 would not result in long-term adverse effects on air quality. No mitigation would be required.

3.2.7 Alternative 4 (Air Quality)

There would be no direct impacts and minor indirect adverse air quality impacts under Alternative 4. Alternative 4 would increase the amount of Limited development compared to the No Action Alternative by converting all Protected areas that do not have an existing lease agreement for use of the government shoreline to Limited Development regardless of dock suitability. The shoreline allocations at Carlton Landing on the north side of Longtown Arm would be changed from Protected to Public Recreation, the lease request for a public marina and other public recreation facilities at Carlton Landing would be granted, and a channel though the standing timber in Longtown Arm would be cleared to allow boat access around Roundtree Landing to the southwest side of Carlton Landing and more direct access to the town center.

Similar to Alternative 3, an increase in the amount of Limited Development shoreline would increase construction of additional docks and boating access resulting in construction emissions and mobile air emissions from increased vehicle transportation to Eufaula Lake and from increased watercraft use.

The Carlton Landing development would include construction of the public marina, approximately 2,570 home lots, a K-12 school, an organic farm, a town center, community pools, public open spaces, and a conference center over a period of 25 to 30 years. Construction emissions resulting from the Carlton Landing development would include exhaust emission from off-road construction equipment, haul trucks, and construction worker employee commuting; fugitive VOC emissions from paving and architectural coatings; and fugitive dust emissions from grading activities and paved road dust. Operational emissions of the Carlton Landing development would include mobile source emission from Carlton Landing residents and visitors, natural gas combustion from space heating, consumer product usage, and landscaping. Vehicle exhaust from on- and off-site construction activities would increase emissions. Indirect emissions would occur from the use of electricity and the organic farm operation.

Construction emissions would occur only in areas where construction is taking place, would be temporary in nature, and would be controlled by standard fugitive dust mitigation techniques. It is not anticipated that Alternative 4 would lead to an increase in air emissions beyond the significance thresholds for air quality. Additionally, construction of residential lots would be expected to span over a 25 to 30 year timeframe; thus, any increases in air emissions would be gradual. Alternative 4 would not result in long-term adverse effect on air quality. No mitigation would be required.

3.2.8 Potential Mitigation Measures (Air Quality)

No mitigation would be required.

3.3 Climate Change and Greenhouse Gas Emissions

3.3.1 Assessment Methods (Climate Change and GHG)

This analysis provides a qualitative assessment of GHG emissions relative to the various alternatives proposed for revisions to the SMP and MP supplement. A qualitative analysis is sufficient because the proposed alternatives have low potential for GHG emission and climate change effects. No direct GHG emissions from changes to shoreline designations would occur; however, indirect GHG emissions from construction, development, and recreational activities allowed as a result of changes to shoreline designations would vary for each alternative. A qualitative analysis provides a basis for identifying and comparing potential differences among GHG emissions, if any, from the various alternatives proposed for revisions to the SMP. The MP would be supplemented to be consistent with the SMP so potential impacts would be the same as described for the proposed SMP updates.

3.3.2 Significance Criteria (Climate Change and GHG)

There is currently no federal regulation in place to govern the effect of climate change and GHG emissions. However, the Council of Environmental Quality (CEQ) provided draft guidance in a February 2010 memorandum that outlines how federal agencies may better consider the effects of GHG emissions and climate change in their NEPA evaluations of proposed federal actions (CEQ 2010). In the "Draft NEPA Guidance on Consideration of the Effects of Climate Change and GHG Emissions," CEQ notes that land management techniques, including changes in land use or land management strategies, lack any established federal protocol for assessing their effects on climate change.

However, it also states that if a proposed action would cause direct emission of 25,000 MT CO_2e on an annual basis, then a quantitative and qualitative assessment of both direct and indirect GHG emissions should be completed. Given the recognized difficulty in quantifying emissions from land management strategies and the fact that there is no GHG inventory for the Eufaula Lake study area, alternatives would create an adverse effect if proposed activities would include activities that would contribute significant GHG emissions.

3.3.3 No Action Alternative (Climate Change and GHG)

There would be no direct or indirect impacts to climate change and GHG emissions under the No Action Alternative. Under the No Action Alternative, there would be no change to the existing shoreline designations, none of the zoning requests would be granted, there would be no change to vegetation management policies, and the lease agreement required for the construction and operation of the proposed public recreation facilities at Carlton Landing would not be granted. Therefore, there would be no increase in GHG emissions due to increased transportation, recreation, construction, or building operation activities. Thus, the No Action Alternative would not result in an adverse effect on climate change and GHG emissions. No mitigation would be required.

3.3.4 Alternative 1 (Climate Change and GHG)

There would be no direct impacts and no indirect adverse impacts to climate change and GHG emissions under Alternative 1. Alternative 1 includes the shoreline allocations as they existed under the 1981 SMP before the area of Limited Development was significantly expanded in subsequent revisions. Limited Development shorelines not allocated as Limited Development in the 1981 SMP would be converted to Protected, none of the zoning requests that involve a change in shoreline allocation would be granted, the vegetation management policies would be changed to apply the extended buffer vegetation management

zone policies, and the lease agreement required for the construction and operation of the proposed public recreational facilities at Carlton Landing would not be granted.

Under Alternative 1, only 605 new private docks would be allowed on the lake, thus limiting potential development density and creating a disincentive for adjacent residential development. Therefore, GHG emissions resulting from construction and development activities associated with Limited Development areas would decrease as a result of Alternative 1 compared to the No Action Alternative. Land access and boating would still be permitted on Protected areas, and Public Recreation shoreline areas would remain the same as in the No Action Alternative. Therefore, GHG emissions from recreational activities, including mobile emissions from vehicles commuting to the Eufaula Lake and watercraft activities, would not increase as a result of Alternative 1.

Implementation of the extended buffer vegetation management zone policy would include the largest buffers proposed to protect shoreline habitats. The extended buffer vegetation management zone policy would protect the largest areas from vegetation clearing and mowing. This would reduce potential GHG emissions from vegetation management activities including from mobile source emissions such as from lawn mowers. Protection of plants and soils may also contribute to the biological sequestration of CO_2 and thus offset GHG emissions from other activities. Therefore, from implementation of the extended buffer vegetation management zone policy would not increase GHG emissions.

There would be no increase in GHG emissions due to increased transportation, recreation, construction, or building operation activities. Thus, Alternative 1 would not result in an adverse effect on climate change and GHG emissions. No mitigation would be required.

3.3.5 Alternative 2 (Climate Change and GHG)

There would be no direct impacts and no indirect adverse impacts to climate change and GHG emissions under Alternative 2. Alternative 2 would reduce the amount of Limited Development shoreline compared to the No Action Alternative by converting Limited Development shorelines that are unsuitable for docks and which do not have existing developments adjacent to USACE-owned lands to Protected. The pending zoning requests that involve a change in shoreline allocation and the lease agreement required for the construction and operation of the proposed public recreational facilities at Carlton Landing would not be granted. The vegetation management policy would be changed to apply the extended buffer vegetation management zone policy.

Alternative 2 would result in a decrease in Limited Development shorelines and a corresponding increase in Protected shorelines. Protected shoreline areas limit development and private activities such as the mooring or construction of privately owned floating facilities. Typically, a change from Limited Development to Protected would result in a decrease in construction and development activities. However, many of the areas that would be converted to Protected from Limited Development include those which are unsuitable for dock development and which would be less likely to experience development pressure and recreational activities such as boating that would result in GHG emissions. Therefore, there would be no increase in GHG emissions due to potential indirect effects on construction and development activities under Alternative 2.

Implementation of the extended buffer vegetation management zone policy would include the largest buffers proposed to protect shoreline habitats. The extended buffer vegetation management zone policy would protect the largest areas from vegetation clearing and mowing, thereby, reducing potential GHG

emissions from vegetation management activities including from mobile source emissions such as lawn mowers. Protection of plants and soils may also contribute to the biological sequestration of CO_2 and thus offset GHG emissions. Therefore, from implementation of the extended buffer vegetation management zone policy would not increase GHG emissions.

Land access and boating would still be permitted on Protected areas, and Public Recreation shoreline areas would remain the same as in the No Action Alternative and the potential full build out of Alternative 2 would be less than under the No Action Alternative. Therefore, GHG emissions from recreational activities, including mobile emissions from vehicles commuting to the Eufaula Lake and from watercraft activities, would not increase as a result of Alternative 2. Thus, Alternative 2 would not result in an adverse effect on climate change and GHG emissions. No mitigation would be required.

3.3.6 Alternative 3 (Climate Change and GHG)

There would be no direct impacts and minor indirect adverse impacts to climate change and GHG emissions under Alternative 3. Alternative 3 would increase the amount of Limited Development shoreline compared to the No Action Alternative by converting Protected areas that are suitable for docks and which do not have an existing lease agreement for use of the government shoreline to Limited Development. The Carlton Landing shoreline areas would be changed from Protected to Limited Development, but the lease request for a public marina and other public facilities at Carlton Landing would not be granted. There would be a minimal change to the amount of shoreline miles designated as Public Recreation and no change to Prohibited allocations. The vegetation management policies would be changed to apply the baseline buffer vegetation management policy.

Implementation of the baseline buffer vegetation management zone policy would include the basic buffers proposed to protect shoreline habitats. The baseline buffers would be 25 feet narrower than the extended buffers thus less shoreline habitat would be protected from vegetation clearing and mowing than under the extended buffer vegetation management zone policy proposed under Alternative 1 and 2. While vegetation clearing and mowing would be prohibited in the buffer zones, vegetation management would be allowed on more land than under the extended buffer vegetation management zone policy. GHG emissions from lawn equipment would be greater than under Alternative 1 and 2, but less than under the No Action Alternative. However, emissions would not be adverse since quantity would likely be insubstantial. Additionally, under the baseline buffer vegetation management policy, plants and soils protected from vegetation management may also contribute to the biological sequestration of CO_2 and thus offset GHG emissions.

An increase in the amount of Limited Development shorelines that are suitable for docks would potentially increase development activities on adjacent private lands and allow the construction of additional docks. Additional dock construction would result in construction emissions from construction vehicles and equipment and construction employee commuting. Additional boating access would result in mobile GHG emissions from increased vehicle transportation to Eufaula Lake and from increased watercraft use. Construction emissions would occur only in areas where construction is taking place and would be temporary. The increase in development activities would likely be insubstantial, and, as a result, it is not anticipated that Alternative 3 would lead to a significant increase in GHG emissions. Therefore, Alternative 3 would not result in long-term adverse effects on climate change and GHG emissions. No mitigation would be required.

3.3.7 Alternative 4 (Climate Change and GHG)

There would be no direct impacts and minor indirect impacts to climate change and GHG emissions under Alternative 4. Alternative 4 would increase the amount of Limited development compared to the No Action Alternative by converting all Protected areas that do not have an existing lease agreement for use of the government shoreline to Limited Development regardless of dock suitability. The shoreline designations at Carlton Landing on the north side of Longtown Arm would be changed from Protected to Public Recreation, the lease request for a public marina and other public recreational facilities at Carlton Landing would be granted, and a channel though the standing timber in Longtown Arm would be cleared to allow boat access around Roundtree Landing to the southwest side of Carlton Landing and more direct access to the town center. The vegetation management policies would be changed to apply the baseline buffer vegetation management zone policy.

Similar to Alternative 3, an increase in the amount of Limited Development shorelines would allow for the construction of additional docks and boating access resulting in construction-related and increased mobile GHG emissions from increased vehicle transportation to Eufaula Lake and from increased watercraft use.

The Carlton Landing development would include construction of the public marina and other public recreational facilities, approximately 2,570 home lots over a 25 to 30 year period, a K-12 school, an organic farm, a town center, community pools, public open spaces, a conference center, and private sewage treatment plant. Construction GHG emissions resulting from the Carlton Landing development would include exhaust emission from off-road construction equipment, haul trucks, construction worker employee commuting, and construction waste disposal. Operational GHG emissions of the Carlton Landing development would include mobile source emissions from Carlton Landing residents and visitors, natural gas combustion from space heating, consumer product usage, and landscaping. Indirect GHG emissions would occur from the use of electricity and water, solid waste disposal, and organic farm operation.

The proposed sewage treatment plant would result in GHG emissions. The Carlton Landing development proposes construction of five sewage lagoons; however two lagoons would be added over time as residential development increases. The lagoons are designed as total retention lagoons with a synthetic liner and under liner collection drain system to store, recycle and treat wastewater. GHG emissions from the proposed wastewater treatment system include CH_4 and N_2O; however, given the size of the proposed Carlton Landing development and estimated wastewater treatment needs spread out over time, it is not expected that emissions from the sewage lagoons would be significant.

Implementation of the baseline buffer vegetation management zone policy would include the basic buffers proposed to protect shoreline habitats. The baseline buffers would be 25 feet narrower than the extended buffers, thus less shoreline habitat would be protected from vegetation clearing and mowing than under the extended buffer vegetation management zone policy proposed under Alternative 1 and 2. While vegetation clearing and mowing would be prohibited in the buffer zone, it would be allowed on more land than under the extended buffer vegetation management zone policy. GHG emissions from lawn equipment would be greater than under Alternative 1 and 2 but less than under the No Action Alternative; however, emissions would not be adverse since quantity would likely be insubstantial. Additionally, under the baseline buffer vegetation management policy, plants and soils protected from vegetation management may also contribute to the biological sequestration of CO_2 and thus offset GHG emissions.

Construction GHG emissions would occur only in areas where construction is taking place and would be temporary. It is not anticipated that Alternative 4 would result in adverse climate change or GHG impacts.

Additionally, residential lots would be expected to be constructed over a 25 to 30 year timeframe; thus, any increases in GHG emissions would be gradual. Thus, Alternative 4 would not result in long-term adverse effect on climate change and GHG emissions. No mitigation would be required.

3.3.8 Climate Change Impacts

While the No Action Alternative and action alternatives would not result in adverse effects on climate change, climate change impacts would result from global increases in GHG emissions. Oklahoma is expected to experience more extreme temperatures including an increase in the number and severity of droughts, increased evaporation, and fewer but more intense rainfall events (Crawford 2009). There would be more runoff and, thus, more flooding and pollution, and erosion would increase. Summers are expected to be longer with spring weather arriving earlier. Winters are expected to be warmer with a longer frost-free period and longer growing season (Crawford 2009). These changes would affect the water supply functions of Eufaula Lake as it is likely that less water would be available. In addition, changing precipitation and temperature patterns would alter the lake ecosystem and vegetation through greater fluctuations in lake levels and invasion of non-native species.

3.3.9 Potential Mitigation Measures (Climate Change and GHG)

No mitigation would be required.

3.4 Water Supply, Flood Storage, and Operation

This section describes potential impacts related to water supply, flood storage, and operation for each of the alternatives. Alternatives 1 through 4 include revisions to the Eufaula Lake SMP. Since the MP would be supplemented to be consistent with the SMP, impacts would be the same as those described for the proposed SMP revisions under Alternatives 1 through 4.

3.4.1 Assessment Methods (Water Supply, Flood Storage, and Operation)

The method for assessing potential impacts involved reviewing available information describing the existing conditions and then identifying direct and indirect impacts in consideration of the regulatory setting and the significance criteria presented in the next section.

3.4.2 Significance Criteria (Water Supply, Flood Storage, and Operation)

Impacts on water supply, flood storage, or operation would be significant if they would result in a reduction in available water supply, flood storage capacity, or other changes in the ability to operate Eufaula Lake for its intended purposes.

3.4.3 No Action Alternative (Water Supply, Flood Storage, and Operation)

The No Action Alternative would not change existing shoreline allocations or land use classifications. Under existing shoreline allocations, there would be Limited Development shoreline available that could accommodate additional private dock development. These areas would be expected to attract additional residential developments on the adjacent private lands where homeowners could take advantage of the lake access and opportunity for private docks. Potential development at Carlton Landing would likely entail development of 170 residential lots, but there would be no public marina or other public recreational facilities on the shoreline. No action would be taken on any of the individual zoning requests as described

in Section 2.4.2 of the Draft EIS. There would be no change to the flowage easement lands or the dam operations under the No Action Alternative.

3.4.3.1 Potential Impacts

Under the No Action Alternative, there would be no changes to water supply, flood storage, or operation of Eufaula Lake. There is sufficient water supply available in Eufaula Lake to accommodate projected growth through 2060 which is the limit of available projections. These demand projections include anticipated residential growth in the region. There would be no impacts to water supply, flood storage, or operation of Eufaula Lake under the No Action Alternative.

3.4.4 Alternative 1 (Water Supply, Flood Storage, and Operation)

Under Alternative 1, shoreline allocations would change to reduce the length of the shoreline allocated to Limited Development. Under Alternative 1, only 605 new private docks would be allowed and thus the lake would likely be much less attractive for new residential development. Potential development at Carlton Landing would be the same as under the No Action Alternative. Individual zoning requests received during scoping would be addressed as described in Section 2.4.3 of the Draft EIS. There would be no change to the flowage easement lands or the dam operations under Alternative 1.

3.4.4.1 Direct Impacts

There would be no direct impacts to water supply, flood storage, or operation of Eufaula Lake under Alternative 1.

3.4.4.2 Indirect Impacts

There is sufficient water supply in Eufaula Lake to accommodate projected demands. Alternative 1 might be expected to slow residential growth around the lake, and thus, result in less demand for surface water supplies.

Less residential development around the lakeshore would result in less impervious surface and clearing of natural vegetation. This would result in more infiltration of stormwater and less runoff, which would reduce stormwater inputs during storm events from the area immediately around the lake. This would improve the flood capacity of the lake over the long-term although the effect would be minor.

There would be no indirect impacts to water supply, flood storage, or operation of Eufaula Lake under Alternative 1.

3.4.5 Alternative 2 (Water Supply, Flood Storage, and Operation)

Under Alternative 2, shoreline allocations would change to reduce the length of the shoreline allocated to Limited Development. Over the long-term, there would likely be less residential development around the lake. Potential development at Carlton Landing would be the same as under the No Action Alternative. Individual zoning requests received during scoping would be addressed as described in Section 2.4.4 of the Draft EIS. There would be no change to the flowage easement lands or the dam operations under Alternative 2.

3.4.5.1 Direct Impacts

There would be no direct impacts to water supply, flood storage, or operation of Eufaula Lake under Alternative 2.

3.4.5.2 Indirect Impacts

There is sufficient water supply in Eufaula Lake to accommodate projected demands. Alternative 2 might be expected to result in less residential growth overall around the lake, and thus, result in less demand for surface water supplies.

Less residential development around the lakeshore would result in less impervious surface and clearing of natural vegetation. This would result in more infiltration of stormwater and less runoff, which would reduce stormwater inputs during storm events from the area immediately around the lake. This would improve the flood capacity of the lake over the long-term although the effect would be minor.

There would be no indirect impacts to water supply, flood storage, or operation of Eufaula Lake under Alternative 2.

3.4.6 Alternative 3 (Water Supply, Flood Storage, and Operation)

Under Alternative 3, shoreline allocations would change to increase the length of the shoreline allocated to Limited Development. Over the long-term, at full build out, there would likely be more residential development around the lake. Potential development at Carlton Landing would be the same as under the No Action Alternative. Individual zoning requests received during scoping would be addressed as described in Section 2.4.5 of the Draft EIS. There would be no change to the flowage easement lands or the dam operations under Alternative 3.

3.4.6.1 Direct Impacts

There would be no direct impacts to water supply, flood storage, or operation of Eufaula Lake under Alternative 3.

3.4.6.2 Indirect Impacts

There is sufficient water supply in Eufaula Lake to accommodate projected demands through 2060. While Alternative 3 might be expected to result in more residential development over the very long-term around the lake, the rate of growth would not be expected to change. Thus, the water supplies would be sufficient at least through 2060. Projections beyond that timeframe would be speculative and unreliable.

More residential development around the lakeshore would result in more impervious surface and clearing of natural vegetation. This would result in less infiltration of stormwater and more runoff, which would increase stormwater inputs during storm events from the area immediately around the lake. This would use some of the flood capacity of the lake over the long-term although the effect would be minor.

There would be no indirect impacts to water supply, flood storage, or operation of Eufaula Lake under Alternative 3.

3.4.7 Alternative 4 (Water Supply, Flood Storage, and Operation)

Under Alternative 4, shoreline allocations would change to increase the length of the shoreline allocated to Limited Development. Over the long-term, at full build out, there would likely be more residential development around the lake. Individual zoning requests received during scoping would be addressed as described in Section 2.4.6 of the Draft EIS. There would be no change to the flowage easement lands or the dam operations under Alternative 4.

Under Alternative 4, full build-out at Carlton Landing would occur, including construction of approximately 2,570 home lots, a K-12 school, an organic farm, a town center, community pools, public open spaces, and a conference center. A public marina and other recreational facilities along the shoreline would be constructed.

3.4.7.1 Direct Impacts

The Carlton Landing development has received a withdrawal permit for 30 AF/year for the purposes of irrigating the common areas in Carlton Landing from the OWRB (Permit #2010-031) (Humphreys 2012). The development does not anticipate needing any additional water for irrigation purposes. This withdrawal would not result in a significant impact to water supply, flood storage, or operation of Eufaula Lake.

3.4.7.2 Indirect Impacts

There is sufficient water supply in Eufaula Lake to accommodate projected demands through 2060. While Alternative 4 might be expected to result in more residential development over the very long-term around the lake, the rate of growth would not be expected to change. Thus, the water supplies would be sufficient at least through 2060. Projections beyond that timeframe would be speculative and unreliable.

More residential development around the lakeshore would result in more impervious surface and clearing of natural vegetation. This would result in less infiltration of stormwater and more runoff, which would increase stormwater inputs during storm events from the area immediately around the lake. This would use some of the flood capacity of the lake over the long-term although the effect would be minor.

There would be no indirect impacts to water supply, flood storage, or operation of Eufaula Lake under Alternative 4.

3.4.8 Potential Mitigation Measures (Water Supply, Flood Storage, and Operation)

There would be no significant direct or indirect impacts to water supply, flood storage, or operation under any of the alternatives. Therefore, no mitigation would be necessary.

3.5 Hazardous Materials

This section describes potential impacts related to hazardous materials for each of the alternatives. Alternatives 1 through 4 include revisions to the 1998 Eufaula Lake SMP. Since the MP would be supplemented to be consistent with the SMP, impacts would be the same as those described for the proposed SMP updates under Alternatives 1 through 4 below.

3.5.1 Assessment Methods (Hazardous Materials)

The method for assessing potential impacts related to hazardous materials involved reviewing available information describing the existing conditions and then identifying direct and indirect impacts in consideration of the regulatory setting and the significance criteria presented in the next section.

3.5.2 Significance Criteria (Hazardous Materials)

Impacts related to hazardous materials would be significant if they would result in the following:

- A significant hazard to the public or environment through the routine transport, storage, use, or disposal of hazardous materials.
- A significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

3.5.3 No Action Alternative, Alternatives 1, 2, and 3 (Hazardous Materials)

Under the No Action Alternative and Alternatives 1, 2, and 3, there would be no change in the existing conditions with respect to the presence of hazardous materials at industrial/commercial sites. There would be no change in the presence or operation of natural gas wells or other existing sources of hazardous materials. The proposed revisions to the SMP and the MP under the No Action Alternative or Alternatives 1, 2, or 3 would have no effect on the potential for new oil or gas wells or on the operation of existing wells and pipelines. Nor would any of these alternatives affect the transport of hazardous materials or the potential for accidental releases of materials carried by trucks or railcars.

Minor spills could occur during construction of new residential developments or boat docks, resulting in an accidental release of construction-related hazardous materials such as fuels and oils from heavy equipment. However, minor spills that could occur during refueling or maintenance of construction equipment would not pose a significant hazard to the public or the environment, as contractors would be required to implement measures to avoid spills and implement spill response activities if a spill did occur.

Oklahoma state law requires that oils and other hazardous substances used on boats be disposed of at approved facilities. Boats must be licensed and are subject to inspection for proper equipment and operation. Operation of boats could result in minor accidental spills during refueling or maintenance, but these would not result in significant impacts.

3.5.4 Alternative 4 (Hazardous Materials)

Under Alternative 4, the proposed revisions to the SMP and MP also would have no effect on the presence of hazardous materials at industrial/commercial sites or the presence or operation of natural gas wells and other existing sources of hazardous materials. There would be no effect on the potential for new oil or gas wells or on the operation of existing wells and pipelines. Nor would there be any effect on the transport of hazardous materials or the potential for accidental releases of materials carried by trucks or railcars.

However, under Alternative 4, a lease of government land at Carlton Landing for the construction of a new 275 to 300 boat slip marina would be approved. The new public marina at Carlton Landing would have fuel storage tanks and other sources of hazardous materials. Development of this marina would be required to follow Oklahoma Corporation Commission guidelines for fuel storage tanks to contain accidental spills and avoid potential impacts from accidental releases. In addition, the marina (and all floating facilities on the lake) would be subject to inspection by the USACE Lake Manager. If an inspection reveals conditions that would cause pollution of public lands or water, the permittee must immediately correct the condition. With implementation of these policies, the addition of new floating facilities, fuel storage tanks, and other sources of hazardous materials under Alternative 4 would not result in a significant impact.

3.5.5 Potential Mitigation Measures (Hazardous Materials)

Appropriate pollution control techniques would be required during construction activities, including development at Carlton Landing, to reduce potential impacts from the accidental release of hazardous materials associated with construction equipment (*e.g.*, fuels and oils) to a less than significant level.

Development along the shoreline, including construction of a public marina, would require permits from USACE, which would include requirements to prevent hazardous materials releases to Eufaula Lake. With implementation of these mitigation measures, potential impacts from all of the alternatives would be reduced to a less than significant level.

3.6 Navigation

This section provides an analysis of potential impacts related to navigation for each of the alternatives. Alternatives 1 through 4 propose revisions to the Eufaula Lake SMP. Since the MP land classification maps would be supplemented to be consistent with the SMP, potential impacts related to navigation would be the same as those described for the proposed SMP revisions under Alternatives 1 through 4.

Alternatives vary in the amount of boating activity that may occur. Alternative 4 includes a proposal to open up portions of Longtown Arm to boating access by dredging and removing standing timber from the lake.

3.6.1 Assessment Methods (Navigation)

Potential impacts were assessed by reviewing available information on the existing conditions related to navigation and then identifying potential impacts of the alternatives under consideration. Existing regulations as described in Section 2.6 and the significance criteria presented in the next section were used to evaluate the potential magnitude of potential impacts.

3.6.2 Significance Criteria (Navigation)

USACE must assure the public's safety and navigational integrity on all waters of the reservoir. Activities that may interfere with navigability may require a permit from either USACE, or the Coast Guard, or both. In Eufaula Lake, USACE does not conduct any activities specific to maintaining commercial or recreational navigational channels within the lake itself. USACE does, however, maintain small boat navigation aids to mark slow speed areas, hazard areas, and areas which are prohibited for boating. Therefore, impacts related to navigation would be significant if they would result in the following:

- Reduction in the ability to maintain navigation aids within Eufaula Lake.
- Interfere with or obstruct the free navigation of navigable waters.

3.6.3 No Action Alternative (Navigation)

The No Action Alternative would not change existing shoreline allocations. Under the No Action Alternative, the number of boats potentially using Eufaula Lake would exceed the recommended carrying capacity of the lake (Section 4.7 of the Draft EIS). This increased boat density would likely require additional navigational aids to promote boating safety. However, this would not be expected to reduce the ability of USACE to maintain navigation aids. (Note, however, that USACE's ability to maintain additional navigational aids is contingent upon budgetary and manpower constraints.) Therefore, while the large number of boats may compromise boating safety and recreational enjoyment, there would be no adverse impact on navigation under the No Action Alternative.

Under the No Action Alternative, a lease for a public marina at Carlton Landing would not be approved. There would be no dredging or removal of standing timber in Longtown Arm. Areas of restricted water

would not change. Small boats typically used for fishing activities would still be able to access this portion of the lake. There would be no change in the existing condition, and there would be no adverse impact on navigation under the No Action Alternative.

3.6.4 Alternative 1 (Navigation)

Under Alternative 1, shoreline allocations would be changed such that Limited Development shorelines would be reduced to those that were mapped under the 1981 SMP. This change would mean that few new private boat docks would be allowed on the lake. Boating use of the lake would be expected to increase slightly as compared to the existing condition; however, the number of boats potentially on the lake would not exceed recommended levels. These conditions would not reduce the ability of USACE to maintain aids to navigation. Therefore, there would be no adverse impact on navigation under Alternative 1.

Under Alternative 1, a lease for a public marina at Carlton Landing would not be approved. The conditions with respect to navigation would be the same as under the No Action Alternative, and there would be no adverse impact on navigation.

3.6.5 Alternatives 2, 3, and 4 (Navigation)

Under Alternatives 2, 3, and 4, the total number of boats potentially using Eufaula Lake would exceed the recommended carrying capacity of the lake (Section 4.7 of the Draft EIS). This increased boat density under these alternatives would likely require additional navigational aids to promote boating safety. However, this would not be expected to reduce the ability of USACE to maintain navigation aids. (Note, however, that USACE's ability to maintain additional navigational aids is contingent upon budgetary and manpower constraints.) Therefore, while the large number of boats may compromise boating safety and recreational enjoyment, there would be no adverse impact on navigation under Alternatives 2, 3, or 4.

3.6.5.1 Carlton Landing Development Proposal

Under Alternative 2 and 3, a lease for a public marina at Carlton Landing would not be approved. The conditions with respect to navigation would be the same as under the No Action Alternative for Alternatives 2 and 3, and there would be no adverse impact on navigation.

Under Alternative 4, the request for a lease for the construction and operation of a marina and other public recreation facilities along the shoreline of Carlton Landing would be approved. The proposed marina would accommodate 275 to 300 new boats and would likely require the installation and maintenance of new navigational aids for safe operation.

Alternative 4 would include the clearing of almost 50 acres of standing timber from the lake in Longtown Arm. This would effectively increase the area of unrestricted water in the lake and allow more active boating activity into the portion of Longtown Arm to the west of Roundtree Landing, which may be considered to be a beneficial effect on navigation. The creation of a channel through the standing timber would likely require the installation and maintenance of additional navigational aids. However, this would not be expected to reduce the ability of USACE to maintain navigation aids, and thus, would not be an adverse effect on navigation. (Note, however, that USACE's ability to maintain additional navigational aids is contingent upon budgetary and manpower constraints.)

3.6.6 Potential Mitigation Measures (Navigation)

There would be no significant impacts related to navigation under any of the alternatives. Therefore, no mitigation would be necessary.

3.7 Energy

3.7.1 Assessment Methods (Energy)

Potential impacts to energy resources and supply are assessed qualitatively based on the potential for future population increases and residential development under the No Action Alternative and action alternatives. Changes in shoreline allocations, land use classifications, and vegetation management policies would not result in direct impacts on energy use and supply; however, changes in the potential amount of development on adjacent private lands under each of the alternatives could result in different patterns of future residential development around the lake and in the larger region, which would, in turn, result in increases in energy use.

3.7.2 Significance Criteria (Energy)

The Council on Environmental Quality (CEQ) dictates requirements for reporting environmental consequences under NEPA. Projects should determine energy requirements and conservation potential of project alternatives as well as applicable mitigation measures (40 CFR § 1502.16 (e)). Although CEQ requires evaluation of energy for federal projects subject to NEPA, no specific thresholds for significance of impacts are identified.

In order to analyze impacts and determine significance of potential impacts, the following are considered:

- Potential impacts on local and regional energy supplies and on requirements for additional capacity.
- Potential impacts on peak demands for electricity and other forms of energy.

3.7.3 No Action Alternative (Energy)

Under the No Action Alternative, the existing shoreline allocations, land use classifications, and vegetation management policies at Eufaula Lake would not change. The lease request for a public marina and other public recreational facilities at Carlton Landing would not be approved, and individual requests to change shoreline allocations would not be approved.

Under the No Action Alternative, the request for a change to the shoreline allocation and a grant of a lease for a marina and other public recreational facilities would not be approved for the Carlton Landing development proposal. Therefore, the expected residential development on adjacent private lands would be limited to approximately 170 lots representing approximately 300 units. This would represent an insignificant increase in energy demand.

Under the No Action Alternative, the number of private boat docks could increase to 8,746 total docks. Each dock would be associated with at least one lot on adjacent residential land. This would give an estimate of the number of new homes that would be built in association with the existing shoreline allocations. This predicted full build out condition would likely take over 70 years to achieve under the No Action Alternative.

The average household size in the six county region around Eufaula Lake is 2.47 persons per household and the total population in 2010 was approximately 201,000 (Section 3.11 of the Draft EIS). Therefore, a projected addition of 8,746 homes/docks would result in a population increase of 21,602 persons or an approximate 10 percent increase over 70 years. Although this projected increase in homes would be located immediately along the lake edge, the growth is projected against the population for the entire six

county area rather than the census tracts closest to the lake because energy suppliers plan for and serve larger areas than census tracts.

Over the next 20 years, the projected growth is much lower. Based on past dock approval rates, it is expected that up to 2800 new docks could be constructed over the next 20 years. This would result in approximately 6,916 additional persons or a 3 percent increase. This predicted growth rate is similar to that observed in the 1990s and early 2000s and is within the range of growth that utilities plan for and would not stress supplies or infrastructure.

It is also significant to note that 56 percent of homeowners adjacent to the lakeshore that were surveyed under the dispersed use recreation survey (Appendix E) reported that they were only seasonal residents of the area. This high proportion of seasonal residents in this predicted growth would further reduce potential effects.

Electric and natural gas utilities would continue to meet demands through increasing efficiencies, improving distribution infrastructure, developing alternative energy to comply with state mandates, and employing demand-side management techniques. Implementation of the No Action Alternative would not result in the need for new supply infrastructure beyond that which would already be funded and constructed under existing conditions. Therefore, there would not be a significant effect on energy resources from the No Action Alternative.

3.7.4 Alternative 1 (Energy)

Under Alternative 1, the existing shoreline allocations of Limited Development would be reduced to those areas that were mapped as Limited Development in the 1981 SMP; the MP land use classification maps would be revised to be consistent with the SMP; and the lease request for a public marina and other public recreational facilities at Carlton Landing would not be approved.

Potential effects related to Carlton Landing would be similar to those described under the No Action Alternative and there would not be an adverse effect on energy.

Under Alternative 1, few new docks would be allowed to be constructed. In addition to residential development associated with these new docks, there could also be some additional residential development on lands adjacent to the government lands around the lake, compared to existing conditions, as the lake would still provide amenities such as water views and proximity to public recreation areas.

Over the past 20 to 30 years, approximately 3 new subdivisions representing a total of 123 lots have been developed per year on average in the six county region around Eufaula Lake. Much of that growth has been associated with the ability to construct new private docks, and so the future rate of growth would be expected to be much less under Alternative 1. However, using a rate of 123 new homes per year projected over the next 20 years, the population might be expected to increase by 6,076 persons. This would be a 3 percent increase in the population of the area around Eufaula Lake. As described under the No Action Alternative, this rate of growth is within the range of growth that utilities plan for and would not stress supplies or infrastructure. Therefore, there would be no effect on energy demand under Alternative 1.

3.7.5 Alternative 2 (Energy)

Under Alternative 2, the amount of Limited Development shoreline would be reduced to 182 miles as Limited Development shorelines that are unsuitable for docks and which do not have existing

developments adjacent to the government lands would be converted to Protected. The MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. The lease request for a public marina and public recreation facilities at Carlton Landing would not be approved.

Potential effects related to Carlton Landing would be similar to those described under the No Action Alternative and there would not be an adverse effect on energy.

Under Alternative 2, up to 5,873 private boat docks could be constructed along the proposed length of Limited Development shoreline. This would be a 33 percent decrease in the number of docks that would be allowed under the No Action Alternative. This predicted full build out condition would likely take over 50 years to achieve under Alternative 2.

Assuming each dock would be associated with at least one lot on adjacent residential land, a projected addition of 5,873 homes/docks would result in a population increase of 14,667 persons or an approximate 7 percent increase over 50 years. The projected growth over the next 20 years would be 3 percent, the same as under the No Action Alternative, because the expected rate of growth in dock construction is expected to be the same between all alternatives. As described under the No Action Alternative, this rate of growth is within the range of growth that utilities plan for and would not stress supplies or infrastructure. Therefore, there would be no effect on energy demand under Alternative 2.

3.7.6 Alternative 3 (Energy)

Under Alternative 3, the amount of Limited Development shoreline would increase to 367 miles by converting Protected shorelines that are suitable for docks and which do not have an existing license agreement for use of the government land to Limited Development. MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. The lease request for a public marina at Carlton Landing would not be approved, but the shoreline in this area would be changed to Limited Development.

Potential effects related to Carlton Landing would be similar to those described under the No Action Alternative and there would not be an adverse effect on energy.

Under Alternative 3, up to 11,844 private boat docks could be constructed along the proposed length of Limited Development shoreline. This would be a 35 percent increase in the number of docks that would be allowed under the No Action Alternative. This predicted full build out condition would likely take over 85 years to achieve under Alternative 3.

Assuming each dock would be associated with at least one lot on adjacent residential land, a projected addition of 11,844 homes/docks would result in a population increase of 29,415 persons or an approximate 15 percent increase over 85 years. The projected growth over the next 20 years would still total a 3 percent increase, the same as under the No Action Alternative, because the expected rate of growth in dock construction is expected to be the same between all alternatives. As described under the No Action Alternative, this rate of growth is within the range of growth that utilities plan for and would not stress supplies or infrastructure. Therefore, there would be no effect on energy demand under Alternative 3.

3.7.7 Alternative 4 (Energy)

Under Alternative 4, the amount of Limited Development area would increase to 479 miles compared to the No Action Alternative by converting all Protected areas that do not have an existing license agreement

for use of the government land to Limited Development. MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. Alternative 4 would grant a lease for a marina and other public recreational facilities along the shoreline at the proposed Carlton Landing development.

Full build-out at Carlton Landing would include 2,570 residential units representing a mix of single family and multifamily housing. The proposed development would also include a K-12 school, an organic farm, a town center, community pools, public open spaces, and a conference center. Under Alternative 4, there would be full build-out of proposed recreational facilities and uses along the shoreline, including a 275 to 300 slip marina. Residential units would be expected to be constructed over a 25 to 30 year timeframe. The marina is proposed to begin operations in 2014.

Kiamichi Electric Cooperative is the most likely supplier of residential energy needs for Carlton Landing as they already serve the Highway 9A and Longtown areas. At full build out, the Carlton Landing development could add 6,348 people to the local area. While many of these homeowners would likely be part-time residents, it is assumed that the residential units would be occupied full time. Therefore, the Carlton Landing development would represent a 3 percent increase in population over the Eufaula Lake region.

The projected growth at Carlton Landing would be expected to occur over a 25 to 30 year timeframe and would not represent “explosive” growth. The expected growth is within the range that Kiamachi Electric Cooperative is planning for and would not represent a significant impact on their ability to provide electric service (Minshall 2012).

Two factors would further offset this potential impact on energy resources. First, the Carlton Landing development is proposed to be a “green” development, with attention paid to construction techniques and the production of an energy efficient residential product. Secondly, similar to other lakeshore residential areas, it would be expected that as many as 56 percent of the residents would only be part time residents, which would further reduce potential energy demands.

Under Alternative 4, up to 15,459 private boat docks could be constructed along the proposed length of Limited Development shoreline. This would be a 77 percent increase in the number of docks that would be allowed under the No Action Alternative. This predicted full build out condition would likely take over 100 years to achieve under Alternative 4.

Assuming each dock would be associated with at least one lot on adjacent residential land, a projected addition of 15,459 homes associated with docks would result in a population increase of 38,342 persons or an approximate 19 percent increase over 100 years. The projected growth over the next 20 years would still total a 3 percent increase, the same as under the No Action Alternative, because the expected rate of growth in dock construction is expected to be the same between all alternatives. As described under the No Action Alternative, this rate of growth is within the range of growth that utilities plan for and would not stress supplies or infrastructure. Therefore, there would be no effect on energy demand under Alternative 4.

3.7.8 Potential Mitigation Measures (Energy)

There would be no significant impacts to energy resources from implementation of the No Action Alternative or action alternatives; therefore, no mitigation measures are proposed for energy resources.

3.8 Land Use Compatibility

3.8.1 Assessment Methods (Land Use Compatibility)

A review of existing land use plans, policies, and regulations of county and municipal governments was conducted to evaluate the compatibility of the alternatives under consideration with land use plans. Land use compatibility was determined by identifying and comparing land use requirements, allowable uses, and goals of local planning agencies and communities for the private lands adjacent lands to Eufaula Lake against the proposed changes to shoreline allocations.

For example, an increase in Limited Development shoreline would allow private shoreline uses including vegetative modification and construction of private floating facilities which may induce growth and lead to development pressures on private property adjacent to the Limited Development shorelines. The development that may occur could be incompatible with local land use plans and zoning in location, density, or character depending on local policies. Therefore, inconsistencies between the proposed shoreline designations and local land use planning must be identified to avoid and prevent incompatible land use.

3.8.2 Significance Criteria (Land Use Compatibility)

For purposes of this land use compatibility analysis, a project's impact would be considered significant if it conflicted with any applicable land use plan, policy, or regulation of a local government with jurisdiction over land adjacent to Eufaula Lake.

3.8.3 No Action Alternative (Land Use Compatibility)

Under the No Action Alternative, the existing shoreline allocations, land use classifications, and vegetation management policies at Eufaula Lake would not change. The lease request for a public marina and other public recreational facilities at Carlton Landing would not be approved, and individual requests to change shoreline allocations would not be approved.

Although a significant number of new docks and associated residential development on adjacent private lands could be constructed under the No Action Alternative, the six counties that surround Eufaula Lake do not have any adopted land use plans or policies in place that address the location, density, or character of new development. The City of Eufaula is the only jurisdiction with a zoning ordinance. This ordinance allows residential land uses along the lake shore. Therefore, there would be no conflicts with local land use planning under the No Action Alternative.

3.8.4 Alternatives 1, 2, 3, and 4 (Land Use Compatibility)

Under all of the action alternatives, the existing shoreline allocations would be revised and the MP land classification maps would be supplemented to make them consistent with the SMP. The change in shoreline allocation and requested grant of a lease for a marina and other public recreational facilities at Carlton Landing would only be approved under Alternative 4.

Only the City of Eufaula has an adopted zoning ordinance. The other jurisdictions around Eufaula Lake do not have adopted land use plans or policies. Only a very small portion of the study area is within the City of Eufaula and so only a small area would be affected by land use plans or policies. Therefore, there would be no conflicts with local land use planning in most of the study area under any of the alternatives.

Carlton Landing is outside of the city limits of the City of Eufaula and would be regulated by Pittsburg County. Since Pittsburg County does not have an adopted land use plan, the Carlton Landing development proposal would be consistent regardless of the scale of the development anticipated under any of the alternatives.

Within the City of Eufaula, most of the shoreline is currently allocated to Public Recreation and is managed by the City of Eufaula or its sub-lessees for public recreation. Where this shoreline is leased to the City, the shoreline allocation would not be changed under any of the alternatives. Private docks are not allowed in these areas; therefore, there would not be any associated development on adjacent private lands related to dock construction under any of the alternatives.

Within the City of Eufaula, there are two individual zoning requests that would result in changes to both shoreline allocations and land use classifications if approved. Under Alternative 4, individual zoning request #3 would be approved to change an area of Limited Development allocated shoreline (Low Density Recreation classified land) to Public Recreation (High Density Recreation) for a fishing pond to be operated by the Lake Eufaula Association. This use would be consistent with the local zoning code. Individual zoning request #9 would change an area of Public Recreation shoreline (High Density Recreation) to Limited Development (Low Density Recreation). This would allow the construction of several private boat docks. The area is within a residential zone and this use would be compatible with the local land zoning code. Therefore, there would be no conflicts with local land use planning in the City of Eufaula.

3.8.5 Potential Mitigation Measures (Land Use Compatibility)

No mitigation would be required.

3.9 Public Infrastructure and Utilities

3.9.1 Assessment Methods (Public Infrastructure and Utilities)

An inventory of the public infrastructure and utilities within the six counties surrounding Eufaula Lake was developed. The proposed alternatives were evaluated to determine if the significance criteria were exceeded.

3.9.2 Significance Criteria (Public Infrastructure and Utilities)

A significant impact to the study area's public infrastructure and utilities would occur if the proposed action directly or indirectly resulted in a deficiency in available capacity that required the construction of new infrastructure or utilities beyond those planned for as part of the expected growth of the region.

3.9.3 No Action Alternative (Public Infrastructure and Utilities)

3.9.3.1 Potential Impacts

Under the No Action Alternative, the existing shoreline allocations, land use classifications, and vegetation management policies at Eufaula Lake would not change. The lease request for a public marina and other public recreational facilities at Carlton Landing would not be approved, and individual requests to change shoreline allocations would not be approved.

Dock construction or vegetation management around the lake would not affect public infrastructure or utilities.

Under this alternative, the Carlton Landing development would likely be limited to the construction of approximately 170 lots representing approximately 300 residential units. This level of development would not affect the transportation network as no new infrastructure would be needed on state or county roads.

The proposed development under the No Action Alternative includes the construction of three zero-output total retention lagoons. This system is anticipated to accommodate the wastewater demands of the development for the foreseeable future. According to the developers, the construction and demolition waste has been and will be disposed of at the Muskogee Community Recycling and Disposal Facility (Humphreys 2012). This landfill is expected to reach capacity in 2024, and could receive the expected construction and demolition waste from the development under the No Action Alternative (ODEQ 2011a). As of July, 2012, the developers were in the process of procuring waste disposal services for residents and businesses within Carlton Landing (Humphreys 2012). Household waste disposal would likely go to Pittsburg County landfill which has an anticipated closure date of 2039. Therefore, the local systems have sufficient capacity for the proposed growth under the No Action Alternative. Thus, no impacts to public infrastructure and utilities are expected under the implementation of the No Action Alternative.

Under the No Action Alternative, the number of private boat docks could increase to 8,746 total docks. Each dock would be associated with at least one lot on adjacent residential land. This would give an estimate of the number of new homes that would be built in association with the existing shoreline allocations. This predicted full build out condition would likely take over 70 years to achieve under the No Action Alternative.

The average household size in the six county region around Eufaula Lake is 2.47 persons per household and the total population in 2010 was approximately 201,000 (Section 3.11 of the Draft EIS). Therefore, a projected addition of 8,746 homes associated with docks would result in a population increase of 21,602 persons or an approximate 10 percent increase over 70 years. Although this projected increase in homes would be located immediately along the lake edge, the growth is projected against the population for the entire six county area rather than the census tracts closest to the lake because utility suppliers plan for and serve larger areas than census tracts.

Over the next 20 years, the projected growth is much lower. Based on past dock approval rates, it is expected that up to 2800 new docks could be constructed over the next 20 years. This would result in approximately 2,800 new households or 6,916 additional persons, which is a 3 percent increase. This predicted growth rate is similar to that observed in the 1990s and early 2000s.

The projected growth is within the expected growth of the region for which utility suppliers are planning. Much of this growth is expected to occur close to the lake which is consistent with the existing pattern of growth in the region. It is also significant to note that 56 percent of homeowners adjacent to the lakeshore that were surveyed under the dispersed use recreation survey (Appendix E) reported that they were only seasonal residents of the area. This high proportion of seasonal residents in this predicted growth would further reduce potential effects. Therefore, no indirect adverse impacts are anticipated under the No Action Alternative.

3.9.4 Alternative 1 (Public Infrastructure and Utilities)

3.9.4.1 Direct Impacts

Under Alternative 1, the existing shoreline allocations of Limited Development would be reduced to those areas that were mapped as Limited Development in the 1981 SMP; the MP land use classification maps

would be revised to be consistent with the SMP; and the lease request for a public marina and other public recreational facilities at Carlton Landing would not be approved.

Potential effects would be similar to those described under the No Action Alternative and there would not be an adverse effect on public infrastructure or utilities.

3.9.4.2 Indirect Impacts

Under Alternative 1, only 605 new docks would be allowed to be constructed. In addition to residential development associated with these new docks, there could also be some additional residential development on lands adjacent to the government lands around the lake, compared to existing conditions, as the lake would still provide amenities such as water views and proximity to public recreation areas.

Over the past 20 to 30 years, approximately 3 new subdivisions representing a total of 123 lots have been developed per year on average in the six county region around Eufaula Lake. Much of that growth has been associated with the ability to construct new private docks, and so the future rate of growth would be expected to be much less under Alternative 1. However, using a rate of 123 new homes per year projected over the next 20 years, the population might be expected to increase by 6,076 persons. This would be a 3 percent increase in the population of the area around Eufaula Lake.

The projected growth is within the expected growth of the region for which utility suppliers are planning. Much of this growth is expected to occur close to the lake which is consistent with the existing pattern of growth in the region. Therefore, no indirect adverse impacts are anticipated under Alternative 1.

3.9.5 Alternative 2 (Public Infrastructure and Utilities)

3.9.5.1 Direct Impacts

Under Alternative 2, the amount of Limited Development shoreline would be reduced to 182 miles as Limited Development shorelines that are unsuitable for docks and which do not have existing developments adjacent to the government lands would be converted to Protected. The MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. The lease request for a public marina and public recreation facilities at Carlton Landing would not be approved.

Potential effects would be similar to those described under the No Action Alternative and there would not be an adverse effect on public infrastructure or utilities.

3.9.5.2 Indirect Impacts

Under Alternative 2, up to 5,873 private boat docks could be constructed along the proposed length of Limited Development shoreline. This would be a 33 percent decrease in the number of docks that would be allowed under the No Action Alternative. This predicted full build out condition would likely take over 50 years to achieve under Alternative 2.

Assuming each dock would be associated with at least one lot on adjacent residential land, a projected addition of 5,873 homes associated with docks would result in a population increase of 14,667 persons or an approximate 7 percent increase over 50 years. The projected growth over the next 20 years would be 3 percent, the same as under the No Action Alternative, because the expected rate of growth in dock construction is expected to be the same between all alternatives.

The projected growth is within the expected growth of the region for which utility suppliers are planning. Much of this growth is expected to occur close to the lake which is consistent with the existing pattern of growth in the region. Therefore, no indirect adverse impacts are anticipated under Alternative 2.

3.9.6 Alternative 3 (Public Infrastructure and Utilities)

3.9.6.1 Direct Impacts

Under Alternative 3, the amount of Limited Development shoreline would increase to 367 miles by converting Protected shorelines that are suitable for docks and which do not have an existing license agreement for use of the government land to Limited Development. MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. The lease request for a public marina at Carlton Landing would not be approved, but the shoreline in this area would be changed to Limited Development.

Potential effects would be similar to those described under the No Action Alternative and there would not be an adverse effect on public infrastructure or utilities.

3.9.6.2 Indirect Impacts

Under Alternative 3, up to 11,844 private boat docks could be constructed along the proposed length of Limited Development shoreline. This would be a 35 percent increase in the number of docks that would be allowed under the No Action Alternative. This predicted full build out condition would likely take over 85 years to achieve under Alternative 3.

Assuming each dock would be associated with at least one lot on adjacent residential land, a projected addition of 11,844 homes associated with docks would result in a population increase of 29,415 persons or an approximate 15 percent increase over 85 years. The projected growth over the next 20 years would still total a 3 percent increase, the same as under the No Action Alternative, because the expected rate of growth in dock construction is expected to be the same between all alternatives.

The projected growth is within the expected growth of the region for which utility suppliers are planning. Much of this growth is expected to occur close to the lake which is consistent with the existing pattern of growth in the region. Therefore, no indirect adverse impacts are anticipated under Alternative 3.

3.9.7 Alternative 4 (Public Infrastructure and Utilities)

3.9.7.1 Direct Impacts

Under Alternative 4, the amount of Limited Development area would increase to 479 miles compared to the No Action Alternative by converting all Protected areas that do not have an existing license agreement for use of the government land to Limited Development. MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. Alternative 4 would grant a lease for a marina and other public recreational facilities along the shoreline at the proposed Carlton Landing development.

Dock construction or vegetation management around the lake would not affect public infrastructure or utilities.

Full build-out at Carlton Landing would include 2,570 residential units representing a mix of single family and multifamily housing. The proposed development would also include a K-12 school, an organic farm, a town center, community pools, public open spaces, and a conference center. Under Alternative 4, there would be full build-out of proposed recreational facilities and uses along the shoreline, including a 275 to

300 slip marina. Residential units would be expected to be constructed over a 25 to 30 year timeframe. The marina is proposed to begin operations in 2014.

Full build out of Carlton Landing would have significant impacts on the transportation network as described in Section 4.9 of the Draft EIS and would likely require construction of new infrastructure to accommodate increased traffic at the entrance to Carlton Landing.

The full development of Carlton Landing would involve construction of five sewage retention lagoons, which are anticipated to provide sanitary services to the residents and businesses within the development for at least five years. The developers acknowledge that further investigation is needed to meet the development's sanitary needs long-term (Humphreys 2012). However, as wastewater management would be developed by the developer for Carlton Landing, this would not result in an impact on public municipal facilities. Furthermore, since wastewater generated on private lands is not allowed to be discharged onto USACE lands, the future wastewater treatment solution developed by Carlton Landing would not be allowed to have an effect on USACE lands or Eufaula Lake.

Household solid waste would likely go to Pittsburg County landfill which has an anticipated closure date of 2039. Although this landfill would not have sufficient capacity to support the long-term occupancy of the development, the proposed population growth is within the expected growth that the county is planning for and would not result in an adverse impact on the utility. Implementation of Alternative 4 could have significant adverse impacts to the public infrastructure and utilities, specifically transportation, within the study area.

3.9.7.2 Indirect Impacts

Under Alternative 4, up to 15,459 private boat docks could be constructed along the proposed length of Limited Development shoreline. This would be a 77 percent increase in the number of docks that would be allowed under the No Action Alternative. This predicted full build out condition would likely take over 100 years to achieve under Alternative 4.

Assuming each dock would be associated with at least one lot on adjacent residential land, a projected addition of 15,459 homes associated with docks would result in a population increase of 38,342 persons or an approximate 19 percent increase over 100 years. The projected growth over the next 20 years would still total a 3 percent increase, the same as under the No Action Alternative, because the expected rate of growth in dock construction is expected to be the same between all alternatives.

Although Alternative 4 has the highest potential amount of growth, it would be expected to occur over a longer time frame and would not exceed that expected growth for which utility suppliers are planning. Much of this growth is expected to occur close to the lake which is consistent with the existing pattern of growth in the region. Therefore, no indirect adverse impacts are anticipated under Alternative 4.

3.9.8 Potential Mitigation Measures (Public Infrastructure and Utilities)

As described in Section 4.9 of the Draft EIS, there would be the potential for adverse impacts on the transportation network related to Carlton Landing. Traffic studies should be conducted to determine the type and extent of needed roadway improvements. These studies and any subsequent roadway improvements would be coordinated between the developer, the county, and ODOT. The developers of Carlton Landing should also work with local transit providers to explore alternatives to accessing the amenities within the development. Such alternatives could include a shuttle service or the establishment

of fixed transit routes. In addition, the developers should determine a means to meet the community's sanitary sewer needs beyond the first five years of development. The developers should ensure that the receiving landfill can handle the capacity of residents' and businesses' solid waste. The implementation of mitigation measures would alleviate potential adverse impacts to the study area.

3.10 Social Services and Community Facilities

3.10.1Assessment Methods (Social Services and Community Facilities)

An inventory of the social services and community facilities within the six counties surrounding Eufaula Lake was developed. Social services and community facilities include education, public safety, and health care that serve residents and visitors to the study area. The proposed alternatives were evaluated to determine if the significance criteria were exceeded.

3.10.2Significance Criteria (Social Services and Community Facilities)

A significant impact to the study area's social services and community facilities would occur if the proposed action directly or indirectly resulted in a deficiency in available services. Such impacts would include population growth that required the construction of new schools, public safety or healthcare systems beyond those planned for as part of the expected growth in the region.

3.10.3No Action Alternative (Social Services and Community Facilities)

3.10.3.1 Potential Impacts

Under the No Action Alternative, the existing shoreline allocations, land use classifications, and vegetation management policies at Eufaula Lake would not change. The lease request for a public marina and other public recreational facilities at Carlton Landing would not be approved, and individual requests to change shoreline allocations would not be approved. There would be no change from the current management direction or level of management intensity.

Dock construction or vegetation management around the lake would not affect social services or community facilities. The number of boating recreationists on the lake would be expected to increase over time to a level that would exceed the carrying capacity of the lake as described in Section 4.7 of the Draft EIS. This would be expected to result in a greater number of boating safety incidents and accidents which could result in the need for increased patrols by the Oklahoma Department of Public Safety (ODPS) Marine Enforcement Division. This potential impact would not be likely to occur within a reasonable planning horizon of 20 years, but could occur at full build out, which would not be expected for more than 70 years.

Under this alternative, the Carlton Landing development would likely be limited to the construction of approximately 170 lots representing approximately 300 residential units.

The Carlton Landing development would be served by the Canadian School District, the Pittsburg County Sherriff's Department, and the Longtown Volunteer Fire Department. According to the developers, the school, police and fire districts have the capacity to serve the Carlton Landing development. In addition, Carlton Landing is planned to be marketed to older singles or couples with college-aged or adult children, retirees, dual-income family households, and younger singles and childless couples (Humphreys 2011). Thus, a significant portion of the potential residents are not anticipated to have large households or households involving school-aged children, thereby mitigating the potential demands on the local

educational systems. In addition, the development would plan to supplement local police protection with a private on-site security. Thus, the development as constructed under the No Action Alternative would not overwhelm the capacities of the educational and public safety service areas.

As described in Section 3.9, under the No Action Alternative, new residential development would be expected adjacent to USACE lands where new private docks would be permitted. The predicted full build out condition would result in an approximate 10 percent increase in population and would likely take over 70 years to achieve under the No Action Alternative. The projected increase over a more reasonably foreseeable planning horizon of 20 years would be expected to be a 3 percent increase, which is within the expected range of growth for the region. Therefore, no indirect adverse impacts are anticipated under the No Action Alternative.

3.10.4Alternative 1 (Social Services and Community Facilities)

3.10.4.1 Direct Impacts

Under Alternative 1, the existing shoreline allocations of Limited Development would be reduced to those areas that were mapped as Limited Development in the 1981 SMP; the MP land use classification maps would be revised to be consistent with the SMP; and the lease request for a public marina and other public recreational facilities at Carlton Landing would not be approved.

Potential effects would be similar to those described under the No Action Alternative and there would not be an adverse effect on social services or community facilities. Since few new private docks would be permitted, the boating carrying capacity of the lake would not be exceeded and there would be no additional impact on marine police services.

Potential effects of the proposed Carlton Landing development under Alternative 1 would be similar to those described for the No Action Alternative and there would be no impact on social services and community facilities.

3.10.4.2 Indirect Impacts

Under Alternative 1, only 605 new docks would be allowed to be constructed. In addition to residential development associated with these new docks, there could also be some additional residential development on lands adjacent to the government lands around the lake, compared to existing conditions, as the lake would still provide amenities such as water views and proximity to public recreation areas.

As described in Section 3.9, the projected growth rate would be somewhat less than the existing condition; therefore, no indirect adverse impacts are anticipated under Alternative 1.

3.10.5Alternative 2 (Social Services and Community Facilities)

3.10.5.1 Direct Impacts

Under Alternative 2, the amount of Limited Development shoreline would be reduced to 182 miles as Limited Development shorelines that are unsuitable for docks and which do not have existing developments adjacent to the government lands would be converted to Protected. The MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. The lease request for a public marina and public recreation facilities at Carlton Landing would not be approved.

Potential effects would be similar to those described under the No Action Alternative. Dock construction or vegetation management around the lake would not affect social services or community facilities. The

number of boating recreationists on the lake would be expected to increase over time to a level that would exceed the carrying capacity of the lake as described in Section 4.7 of the Draft EIS. This would be expected to result in a greater number of boating safety incidents and accidents which could result in the need for increased patrols by the ODPS Marine Enforcement Division. This potential impact would not be likely to occur within a reasonable planning horizon of 20 years, but could occur at full build out, which would not be expected for more than 50 years.

Potential effects of the proposed Carlton Landing development under Alternative 2 would be similar to those described for the No Action Alternative and there would be no impact on social services and community facilities.

3.10.5.2 Indirect Impacts

As described in Section 3.9, under Alternative 2, new residential development would be expected adjacent to USACE lands where new private docks would be permitted. The predicted full build out condition would result in an approximate 7 percent increase in population and would likely take over 50 years to achieve under Alternative 2. The projected increase over a more reasonably foreseeable planning horizon of 20 years would be expected to be a 3 percent increase, which is within the expected range of growth for the region. Therefore, no indirect adverse impacts are anticipated under Alternative 2.

3.10.6Alternative 3 (Social Services and Community Facilities)

3.10.6.1 Direct Impacts

Under Alternative 3, the amount of Limited Development shoreline would increase to 367 miles by converting Protected shorelines that are suitable for docks and which do not have an existing license agreement for use of the government land to Limited Development. MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. The lease request for a public marina at Carlton Landing would not be approved, but the shoreline in this area would be changed to Limited Development.

Potential effects would be similar to those described under the No Action Alternative. Dock construction or vegetation management around the lake would not affect social services or community facilities. The number of boating recreationists on the lake would be expected to increase over time to a level that would exceed the carrying capacity of the lake as described in Section 4.7 of the Draft EIS. This would be expected to result in a greater number of boating safety incidents and accidents which could result in the need for increased patrols by the ODPS Marine Enforcement Division. This potential impact would not be likely to occur within a reasonable planning horizon of 20 years, but could occur at full build out, which would not be expected for more than 85 years.

Potential effects of the proposed Carlton Landing development under Alternative 3 would be similar to those described for the No Action Alternative and there would be no impact on social services and community facilities.

3.10.6.2 Indirect Impacts

As described in Section 3.9, under Alternative 3, new residential development would be expected adjacent to USACE lands where new private docks would be permitted. The predicted full build out condition would result in an approximate 15 percent increase in population and would likely take over 85 years to achieve under Alternative 3. The projected increase over a more reasonably foreseeable planning horizon of 20

years would be expected to be a 3 percent increase, which is within the expected range of growth for the region. Therefore, no indirect adverse impacts are anticipated under Alternative 3.

3.10.7 Alternative 4 (Social Services and Community Facilities)

3.10.7.1 Direct Impacts

Under Alternative 4, the amount of Limited Development area would increase to 479 miles compared to the No Action Alternative by converting all Protected areas that do not have an existing license agreement for use of the government land to Limited Development. MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. Alternative 4 would grant a lease for a marina and other public recreational facilities along the shoreline at the proposed Carlton Landing development.

Potential effects would be similar to those described under the No Action Alternative. Dock construction or vegetation management around the lake would not affect social services or community facilities. The number of boating recreationists on the lake would be expected to increase over time to a level that would exceed the carrying capacity of the lake as described in Section 4.7 of the Draft EIS. This would be expected to result in a greater number of boating safety incidents and accidents which could result in the need for increased patrols by the ODPS Marine Enforcement Division. This potential impact would not be likely to occur within a reasonable planning horizon of 20 years, but could occur at full build out, which would not be expected for over 100 years.

Full build-out at Carlton Landing would include 2,570 residential units representing a mix of single family and multifamily housing. The proposed development would also include a K-12 school, an organic farm, a town center, community pools, public open spaces, and a conference center. Under Alternative 4, there would be full build-out of proposed recreational facilities and uses along the shoreline, including a 275 to 300 slip marina. Residential units would be expected to be constructed over a 25 to 30 year timeframe. The marina is proposed to begin operations in 2014.

As Carlton Landing approaches full build-out, the developers propose to form their own volunteer fire department and to construct a K-12 school to meet increasing safety and educational services demands. These initiatives, along with the private security provided by the development, would mitigate any potential impacts on public safety providers from the proposed development. In addition, the proposed development is planned to include a community pool, public open spaces, and a conference center, and thus, would provide many of its own community facilities on-site. Therefore, the Carlton Landing development as constructed under Alternative 4 would not significantly impact the social services and community facilities of the study area.

3.10.7.2 Indirect Impacts

As described in Section 3.9, under Alternative 4, new residential development would be expected adjacent to USACE lands where new private docks would be permitted. The predicted full build out condition would result in an approximate 19 percent increase in population and would likely take over 100 years to achieve under Alternative 4. The projected increase over a more reasonably foreseeable planning horizon of 20 years would be expected to be a 3 percent increase, which is within the expected range of growth for the region. Therefore, no indirect adverse impacts are anticipated under Alternative 4.

3.10.8Potential Mitigation Measures (Social Services and Community Facilities)

No mitigation would be necessary.

3.11 Environmental Justice

3.11.1Assessment Methods (Environmental Justice)

Environmental justice is concerned with potential impacts to minority and low-income populations. The 2010 U.S. Census Bureau racial and income statistics for the study area were compiled and analyzed. The proposed alternatives were evaluated to determine if the significance criteria were exceeded.

3.11.2Significance Criteria (Environmental Justice)

A significant environmental justice impact is defined by EO 12898, Section 1-101 as a "disproportionately high and adverse" effect on a minority or low-income population.

3.11.3No Action Alternative (Environmental Justice)

3.11.3.1 Potential Impacts

Under the No Action Alternative, the existing shoreline allocations, land use classifications, and vegetation management policies at Eufaula Lake would not change. The lease request for a public marina and other public recreational facilities at Carlton Landing would not be approved, and individual requests to change shoreline allocations would not be approved. Under this alternative, the Carlton Landing development would likely be limited to the construction of approximately 170 residential lots.

Though an individual within the study area is less likely to belong to a racial minority than within the state or nation as a whole, he or she is more likely to be living in poverty. However, per EO 12898, Section 1-101, in order for environmental justice to be a concern, the proposed alternative would have to have a "disproportionately high and adverse" effect on a minority or low-income population. The construction of new docks or lake access under the No Action Alternative would not displace minorities or low income populations. The Carlton Landing development, as built under the No Action Alternative, would not result in the removal or relocation of any existing homes including those of minority or low-income populations. Thus, the No Action Alternative would not adversely impact these populations.

Although there would be the potential for a significant amount of new residential development on private lands adjacent to the USACE-owned lands along shorelines where new dock construction would be allowed, this growth would be consistent with the predicted growth rate for the study area. Much of the available land is rural and lightly developed or undeveloped. Therefore, no indirect adverse impacts on environmental justice populations would be anticipated under the No Action Alternative.

3.11.4Alternative 1 (Environmental Justice)

3.11.4.1 Direct Impacts

Under Alternative 1, the existing shoreline allocations of Limited Development would be reduced to those areas that were mapped as Limited Development in the 1981 SMP; the MP land use classification maps would be revised to be consistent with the SMP; and the lease request for a public marina and other public

recreational facilities at Carlton Landing would not be approved. Only 605 new docks would be permitted under this alternative and therefore, there would be minimal construction associated with private docks.

Potential effects would be similar to those described under the No Action Alternative and there would not be an adverse effect on environmental justice populations.

3.11.4.2 Indirect Impacts

Under Alternative 1, although, few new private docks would be permitted, there could still be additional residential development on lands adjacent to the government lands around the lake, compared to existing conditions, as the lake would still provide amenities such as water views and proximity to public recreation areas. Similar to the No Action Alternative, this new residential development near USACE-owned lands would not result in adverse impacts on environmental justice populations.

3.11.5Alternative 2 (Environmental Justice)

3.11.5.1 Direct Impacts

Under Alternative 2, the amount of Limited Development shoreline would be reduced to 182 miles as Limited Development shorelines that are unsuitable for docks and which do not have existing developments adjacent to the government lands would be converted to Protected. The MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. The lease request for a public marina and public recreation facilities at Carlton Landing would not be approved.

Potential effects would be similar to those described under the No Action Alternative and there would not be an adverse effect on environmental justice populations.

3.11.5.2 Indirect Impacts

Although there would be the potential for a somewhat less new residential development on private lands adjacent to the USACE-owned lands than under the No Action Alternative, the potential indirect effects would be the same as the No Action Alternative. Therefore, no indirect adverse impacts on environmental justice populations would be anticipated under Alternative 2.

3.11.6Alternative 3 (Environmental Justice)

3.11.6.1 Direct Impacts

Under Alternative 3, the amount of Limited Development shoreline would increase to 367 miles by converting Protected shorelines that are suitable for docks and which do not have an existing license agreement for use of the government land to Limited Development. MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. The lease request for a public marina at Carlton Landing would not be approved, but the shoreline in this area would be changed to Limited Development.

Potential effects would be similar to those described under the No Action Alternative and there would not be an adverse effect on environmental justice populations.

3.11.6.2 Indirect Impacts

Although there would be the potential for a significant amount of new residential development on private lands adjacent to the USACE-owned lands along shorelines where new dock construction would be allowed, this growth would be consistent with the predicted growth rate for the study area. Much of the

available land is rural and lightly developed or undeveloped. Therefore, no indirect adverse impacts on environmental justice populations would be anticipated under Alternative 3.

3.11.7Alternative 4 (Environmental Justice)

3.11.7.1 Direct Impacts

Under Alternative 4, the amount of Limited Development area would increase to 479 miles compared to the No Action Alternative by converting all Protected areas that do not have an existing license agreement for use of the government land to Limited Development. MP land use classification maps would be revised to be consistent with the SMP shoreline allocations. Alternative 4 would grant a lease for a marina and other public recreational facilities along the shoreline at the proposed Carlton Landing development.

The construction of new docks or lake access under the No Action Alternative would not displace minorities or low income populations.

Full build-out at Carlton Landing would include 2,570 residential units representing a mix of single family and multifamily housing. While all of this housing is planned to be sold at market rates and the mix does not include any affordable housing as defined by the U.S. Department of Housing and Urban Development, the variety of home prices, sizes, and types would offer a greater range of housing options than might otherwise be available. The Carlton Landing development, as proposed under the Alternative 4, would not result in the direct removal or relocation of existing homes including those of minority or low-income populations. Thus, Alternative 4 would not adversely impact these populations.

Figures 3.11-1 and **3.11-2** show the proposed Carlton Landing development and proposed shoreline allocations in relation to the minority and poverty rates and median household incomes within the study area under Alternative 4.

3.11.7.2 Indirect Impacts

Although, under Alternative 4, there would be the greatest potential for new residential development on private lands adjacent to the USACE-owned lands along shorelines where new dock construction would be allowed, this growth would be consistent with the predicted growth rate for the study area. Much of the available land is rural and lightly developed or undeveloped. Therefore, no indirect adverse impacts on environmental justice populations would be anticipated under Alternative 4.

3.11.8 Potential Mitigation Measures (Environmental Justice)

No mitigation would be necessary.

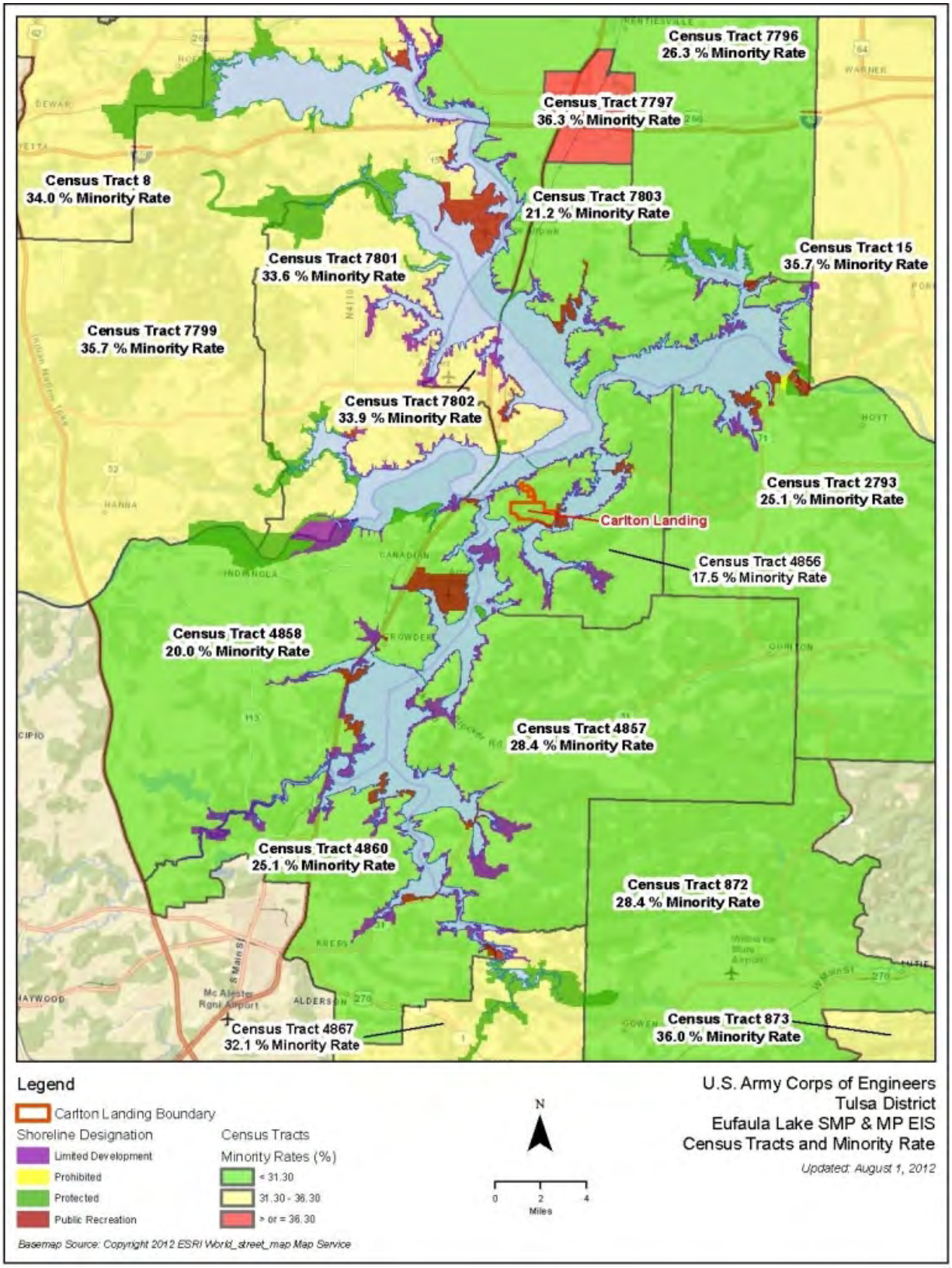


Figure 3.11-1. Alternative 4 Proposed Development in Relation to the Minority Rate within the Census Tracts of the Study Area per 2010 U.S. Census Data

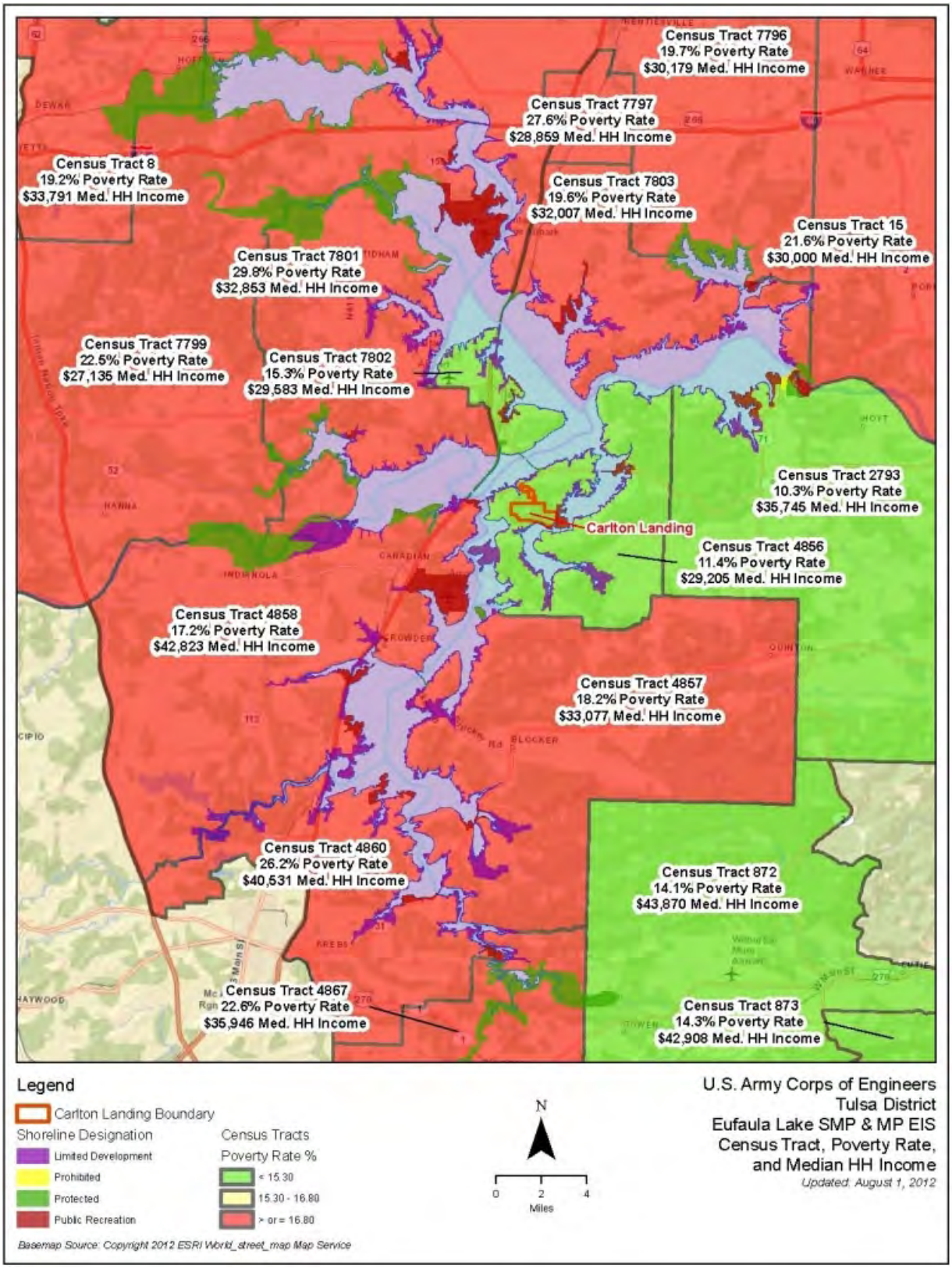


Figure 3.11-2. Alternative 4 Proposed Development in Relation to the Poverty Rate and Median Household Income within the Census Tracts of the Study Area per 2010 U.S. Census Data

Section 4
Conclusions

4.1 Agricultural Lands

None of the alternatives, including the No Action Alternative, would result in direct impacts on lands leased for agricultural uses on USACE-owned lands. However, there is the potential for indirect effects to farmlands around the lake as a result of changes in shoreline allocations and changes in the amount of new residential development adjacent to the lake. These indirect effects would be less than significant.

No mitigation measures would be required because there would be no significant impacts to agricultural lands under any of the alternatives.

4.2 Air Quality

There would be no direct or indirect impacts on air quality under the No Action Alternative and Alternatives 1 and 2. Alternatives 3 and 4 would result in no direct impacts and minor indirect impacts as a result of the increase in amount of Limited Development area, which leads to more dock construction, boat operation, and development of new residential areas on adjacent private lands.

No mitigation would be required for any alternative.

4.3 Climate Change and Greenhouse Gas Emissions

No direct GHG emissions from changes to shoreline designation would occur; however, indirect GHG emissions from construction, development, and recreational activities allowed as a result of those changes would vary for each alternative. Under the No Action Alternative and Alternatives 1 and 2, there would be no direct or indirect impacts. Alternatives 3 and 4 would have no direct and minor indirect impacts to climate change and GHG emissions.

No mitigation would be required for any alternative.

4.4 Water Supply, Flood Storage, and Operation

There would be no significant direct or indirect impacts on water supply, flood storage or operation of Eufaula Lake under any of the alternatives. Therefore, no mitigation would be required.

4.5 Hazardous Materials

Direct and indirect impacts related to hazardous materials would be less than significant for No Action and Alternatives 1, 2, and 3. Under Alternative 4, there is a potential for adverse direct impacts related to hazardous material releases during construction of boat docks and the proposed marina. Similarly, there is an increased potential for spills or leaks from boat engines under Alternative 4, an indirect impact due to increased recreational use of the lake.

Appropriate pollution control techniques would be required during construction, including development at Carlton Landing, to reduce potential impacts from the accidental release of hazardous materials associated

with construction equipment (*e.g.*, fuels and oils) to a less than significant level. Development along the shoreline, including construction of a public marina, may require a permit from the USACE under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act, which would include requirements to prevent hazardous materials releases to Eufaula Lake. With implementation of these mitigation measures, potential impacts from construction would be reduced to a less than significant level.

4.6 Navigation

None of the alternatives would have significant direct or indirect impacts related to the ability of USACE to maintain navigation aids. (Note, however, that USACE's ability to maintain additional navigational aids is contingent upon budgetary and manpower constraints.) Therefore, no mitigation would be required.

4.7 Energy

None of the alternatives would have significant direct or indirect impacts on energy resources. Therefore, no mitigation would be required.

4.8 Land Use Compatibility

There would be no conflicts with local land use planning under any of the alternatives. Therefore, no mitigation would be required.

4.9 Public Infrastructure and Utilities

Alternative 4 is the only alternative that would potentially result in significant direct impacts on public infrastructure and utilities. None of the alternatives would have significant indirect impacts.

Carlton Landing, as developed under Alternative 4, would increase traffic within and around the proposed neighborhood. Necessary improvements to Highway 9A would need to be developed by the developer, the county, and ODOT as the traffic generated by the residents of Carlton Landing reach thresholds that impact level of service and safety at the entrance of Carlton Landing. In addition, the developers would need to determine a means to meet the community's sanitary sewer needs beyond the first five years of proposed development that does not require discharges onto USACE lands. The developers should also ensure that the receiving landfill can handle the capacity of residents' and businesses' solid waste over the long-term. The implementation of these measures would alleviate potential adverse impacts to the study area.

4.10 Social Services and Community Facilities

None of the alternatives would result in significant direct or indirect impacts on social services and community facilities. Therefore, no mitigation would be required.

4.11 Environmental Justice

None of the alternatives would result in significant direct or indirect impacts on environmental justice populations. Therefore, no mitigation would be required.

Section 5
References

American Farmland Trust, Farmland Information Center. 2006. Farmland Protection Policy Act Fact Sheet. August 2006.

Ashmore, S. 2012. Personal Communication on September 19, 2012. Muskogee County.

Bass, Carlton. 2011. Public Comment Letter submitted July 27, 2011.

Booth, D., D. Hartley, and R. Jackson. 2002. *Forest Cover, Impervious-Surface Area, and the Mitigation of Stormwater Impacts*. Journal of the American Water Resources Association, Vol. 38, No. 3:835-845.

Bowen, D. 2008. Eufaula Lake 5-year lake management plan. Oklahoma Department of Wildlife Conservation: Fisheries Division-Central Region.

Bradley, Priscilla. 2011. Public Comment Letter submitted July 25, 2011.

Brooks, G. 2012. Personal Communication on June 14, 2012. Town of Crowder.

Brown, G. 2012. Personal Communication on June 8, 2012. Haskell County.

CEQ. 2002. Memorandum for the Heads of Federal Agencies. January 30, 2002. Accessed 04 12 12. Available online at: http://ceq.hss.doe.gov/nepa/regs/cooperating/cooperatingagenciesmemorandum.html

CEQ, Executive Office of the President. 2005. *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis.*

CEQ. 2010. *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. February 18.

City of Eufaula. 2012. Eufaula Oklahoma City Code. Part 12 Planning, Zoning, and Development. Available at http://www.sterlingcodifiers.com/codebook/index.php?book_id=554 Accessed June 12, 2012.

Cobbs, J.H. 1979. *Study of Acid Water Drainage, Gaines Creek Arm, Eufaula Lake, Canadian River, Oklahoma.*

Council on Environmental Quality (CEQ), Executive Office of the President. 1997. Considering Cumulative Effects under the National Environmental Policy Act.

Crawford, Ken. 2009. Oklahoma Climatological Survey. Climate Change Facts: Should Oklahoma Be Concerned? May. Available at: http://www.owrb.ok.gov/supply/ocwp/pdf_ocwp/WaterPlanUpdate/watersciencesemin ar/CrawfordClimateChange.pdf. Accessed September 11, 2012.

Dawson, W. 2012. Personal Communication on June 8, 2012. McIntosh County.

Environmental Protection Agency (EPA). 1994. EMAP Surface waters field operations manual for lakes. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Las Vegas, NV.

EPA. 2003. Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems, available at: http://www.epa.gov/owm/septic/pubs/septic_guidelines.pdf.

EPA. 2007b. Survey of the Nation's Lakes s. Field Operations Manual. EPA 841-B-07-004. U.S. Environmental Protection Agency, Washington D.C. Available online at: http://water.epa.gov/mwg-internal/de5fs23hu73ds/progress?id=QriRWbZ1da

EPA. 2008. The National Emissions Inventory. Available at: http://www.epa.gov/ttn/chief/net/2008inventory.html. Accessed on July 2, 2012

EPA. 2010. National Lakes Assessment: technical appendix—data analysis approach. EPA 841-R-09-001a. U.S. Environmental Protection Agency, Office of Water and Office of Research and Development, Washington, D.C. 63 pp.

EPA. 2011. National Ambient Air Quality Standards (NAAQS). Available at: http://www.epa.gov/air/criteria.html. Accessed June 1, 2012.

EPA. 2012a. Air Data. Monitor values Report. Available at: http://www.epa.gov/airdata/ad_rep_mon.html. Accessed June 5, 2012

EPA. 2012b. GHG Data: 2010 Greenhouse Gas Emissions from Large Facilities. Available at: http://ghgdata.epa.gov/ghgp/main.do. Accessed August 13, 2012.

EPA. 2012c. Sources of Greenhouse Gas Emissions. Available at: http://epa.gov/climatechange/ghgemissions/sources.html. Accessed August 14, 2012.

EPA. 2012d. *The Green Book Nonattainment Areas for Criteria Pollutants.* March. Available at: http://www.epa.gov/oaqps001/greenbk/index.html. Accessed June 29, 2012.

Federal Aviation Administration. 2012. Airport Data and Contacts. Available at: http://www.faa.gov/airports/airport_safety/airportdata_5010/. Accessed: July 3, 2012.

Flynn, M. 2012. Bureau of Land Management, Oklahoma Field Office. Email communication on June 7, 2012.

Frank, B. 2012. Personal communication on May 23, 2012.

Gilliland, G. 2012. Oklahoma Department of Wildlife Conservation. Personal communication on May 23, 2012.

Henley, Tim. 2012. Personal communication with Alexandra Kleyman, CDM Smith. 11 September 2012.

Hoefling, Larry. 2008. *Pittsburg County*. Arcadia Publishing, Charleston SC.

Humphreys, Grant. 2011. Email communication between Kate Stenberg, CDM Smith, and Grant Humphreys, Humphreys Partners 2009 LLC. December 1, 2011.

Humphreys, G. 2012. Personal Communication. Email response to questions regarding Carlton Landing development proposal. July 9, 2012.

Humphreys Partners, LLC. LLC. 2011. Carlton Landing Public Response.

KI BOIS Area Transit System. Available at: http://www.kibois.org/tran_about.html. Accessed: June 30, 2012

Marcy, J.B. and Jackson, J. 2009. Flotation analysis for boat docks on U.S. Army Corps of Engineers projects. Environmental Laboratory, USACE Engineer Research and Development Center—Recreation Management Support Program. ERDC/EL TR-09-5. 34 pp.

Mayer, P.M., S.K. Reynolds, M.D. McCutchen, and T.J. Canfield. 2007. Meta-Analysis of Nitrogen Removal in Riparian Buffers. *Journal of Environmental Quality*, 36: 1172-1180.

McAlester City Council. June 28, 2011. Notice of Meeting Agenda Packet. Available at: http://ok-mcalester.civicplus.com/archives/59/agenda_packet_062811.pdf. Accessed: July 31, 2012.

McCarty, A, 2012. Personal communication on May 23, 2012.

Minshall, T. 2012. Personal Communication. Member Services Representative, Kiamichi Electric Cooperative.

Morris, Connie. 2011. Executive Director Lake Eufaula Association. Public Comment Letter submitted July 27, 2011.

Nairn, Robert W. 2000. Use of Staged Wetlands for Mitigation of Acid Mine Drainage: Final Report. Oklahoma Conservation Commission, available at: http://www.okcc.state.ok.us/WQ/WQ_reports/report071.pdf.

Nairn, R.W. 2003. Use of Staged Wetlands for Mitigation of Acid Mine Drainage. Final Report to the Oklahoma Conservation Commission, Project FY 95 319(H) C9-996100-03-0, Oklahoma City, Oklahoma.

National Association of Home Builders. 2012. Economic Benefits of New Home Construction. Available at: http://www.nahb.org/fileUpload_details.aspx?contentID=155811. Accessed: July 9, 2012.

Oklahoma Corporation Commission, Public Utility Division. 2010. State of Oklahoma Eleventh Electric System Planning Report. Prepared by the Oklahoma Corporation Commission's Public Utility Division. December 2010. Accessed 13 August 2012. Available online at: http://www.occeweb.com/pu/PUD%20Reports%20Page/11th%20ESPR-2010.pdf

Oklahoma Corporation Commission , Public Utility Division. 2012. Electric Utilities website. Accessed 13 August 2012. Available online at: http://www.occeweb.com/pu/puregelectric.htm

Oklahoma Climatological Survey 2012. 2012. Climate of Oklahoma. Available at: http://climate.ok.gov/index.php/site/page/climate_of_oklahoma. Accessed June 4, 2012

Oklahoma Department of Commerce. (September 2009a). SE Oklahoma Workforce Investment Area Economic Profile. Available at: http://okcommerce.gov/assets/files/data-and-research/workforce-data/Southeast_WIA_Economic_Profile_2009_1108061959.pdf. Accessed: July 30, 2012

Oklahoma Department of Commerce. (September 2009b). Eastern Oklahoma Workforce Investment Area Economic Profile. Available at: www.okcommerce.gov/Libraries/Documents/Eastern-WIA-Economic-Profile-2_3358.pdf. Accessed: July 30, 2012

Oklahoma Department of Commerce. (Spring/Summer 2010). Major Oklahoma Employers. Available at: www.okcommerce.gov/Libraries/Documents/Oklahoma-Major-Employers_1238.pdf. Accessed: July 30, 2012

Oklahoma Department of Environmental Quality (ODEQ). 2010. Air Data Report. Available at: http://www.deq.state.ok.us/aqdnew/air%20report/2010report_intro.html. Accessed June 4, 2012.

ODEQ, Air Quality Division. 2011a. Evaluation of Permit Application No. 2011-564-TVR2. Available at: http://www.deq.state.ok.us/apps/nondiv/permitspublic/storedpermits/2180.pdf. Accessed: July 15, 2012.

Oklahoma Department of Transportation (ODOT). 2007. Oklahoma General County Roads Maps. Maps 46 and 61. Accessed 26 June 2012. Available online at: http://www.okladot.state.ok.us/maps/county/index.htm.

ODOT. 2009. Needs Study and Sufficiency Rating Report, 2009 Volume I. Accessed 26 June 2012. Available online at: http://www.okladot.state.ok.us/public-info/index.htm.

ODOT. 2012. Directory of Public Transportation in Oklahoma. Available at: http://www.okladot.state.ok.us/transit/s5311/index.htm. Accessed: June 30, 2012.

Oklahoma Employment Security Commission. n.d. McIntosh County: Historical Background. Economic Base Report of the Oklahoma Employment Security Commission, vertical file of the Eufaula Memorial Library.

Oklahoma Office of Geographic Information. 2012. School Districts. Available at: http://ogi.state.ok.us/ogi/search.aspx. Accessed: July 13, 2012.

Oklahoma State Department of Education. 2012. Oklahoma Public School Enrollment Increases. Available at: http://www.ok.gov/sde/newsblog/2012-01-11/oklahoma-public-school-enrollment-increases. Accessed: June 26, 2012.

Oklahoma Tourism and Recreation Department (OTRD). 2012. Oklahoma Lake Conditions: Current Conditions Eufaula Lake, available at: http://www.travelok.com/checkmyoklake/#current.

Oklahoma Water Resources Board (OWRB). 2006. Demonstration project: Mitigation of non-point source impact to littoral zone of Lake Carl Blackwell, Payne County, Oklahoma—Final Report. Task FY-01 319(h) Task #01-003 CA #C9-996100-07 Project 3 Subtasks 5.1.2 & 5.1.3. Funded by the Environmental Protection Agency. 65 pp.

OWRB. 2011. Oklahoma Water Quality Standards, available at: http://www.owrb.ok.gov/util/rules/rules.php#ch46.

OWRB. 2012. Oklahoma Comprehensive Water Plan, Eufaula Watershed Planning Region Report.

Pennington, G. 2012. Personal Communication on June 8, 2012. City of Eufaula Planning Department.

Roberts, Bob. 2011. President of B.R. Falcon, Inc. Public Comment Letter submitted July 7, 2011.

Rogers, Gene. 2012a. Personal communication on May 22, 2012.

Rogers, Gene. 2012b. Personal communication with Alexandra Kleyman, CDM Smith. 26 June 2012.

Rowe, Jim and O'Brien, Shawn. 2011. Managers of R&O Trading Company, L.L.C. Public Comment Letter submitted August 1, 2011.

Saltsman, Parker. 2011. Owner Saltsman's Orchard. Public Comment Letter submitted July 25, 2011.

Schrodt, C. 2012. Personal communication with Charles Schrodt, Environmental Specialist, USACE, June 18, 2012.

Sellers, Stephanie Kay. 2011. Developer Lake View Country Estates V; Dam North Eufaula Cliffs Porum Landing; Duchess Creek Acres I and II Porum Landing. Public Comment submitted August 1, 2011.

Smith, K. 2012. Personal Communication on May 22, 2012. Pittsburg County.

Sterling Codifiers, Inc., Eufaula, Oklahoma, City Code, passed January 12, 2012, http://www.sterlingcodifiers.com/codebook/index.php?book_id=554.

Sycamore Bay Property Owners. 2011. Public Comment Letter.

USACE. 1994. Eufaula Lake, North Canadian River, Oklahoma, Water Control Manual. January.

USACE. 1996. Engineer Pamphlet (EP) 1130-2-550 - Project Operations – Recreation Operations and Maintenance Guidance and Procedures. USACE, Washington, D.C.

USACE. 1998. Shoreline Management Plan Eufaula Dam and Reservoir, Canadian River, Oklahoma. USACE, Tulsa District, Oklahoma.

USACE. 2010. Master Plan, Eufaula Lake, Canadian River, Oklahoma. Updated 17 February 2010, Prepared by Tulsa District, U.S. Army Corps of Engineers.

USACE. 2012a. Eufaula Lake Shoreline Management Permit Guidance for Shoreline and Wildlife Habitat Protection. January 27, 2012.

USACE. 2012b. Eufaula Lake Website: http://www.swt.usace.army.mil/PROJECTS/civil/civil_projects.cfm?number=10. Accessed June 21, 2012.

U.S. Census Bureau. 2011a. Poverty Thresholds. Available at: http://www.census.gov/hhes/www/poverty/data/threshld/. Accessed June 30, 2012.

U.S. Census Bureau. 2011b. Small Area Income and Poverty Estimates (SAIPE) for School Districts, Counties and States. Available at: http://www.census.gov/hhes/www/saipe/index.html. Accessed June 30, 2012.

U.S. Census Bureau, American FactFinder. No date. Available at: http://factfinder2.census.gov/. Accessed: May -July 2012

United States Department of Agriculture (USDA), Farm Service Agency (FSA). 2012. Summary of Active and Expiring CRP Cropland Acres by County. CRP Monthly Contracts Report. Data as of May 2012. Prepared June 1, 2012. Accessed 18 June 2012. Available online at: https://arcticocean.sc.egov.usda.gov/CRPReport/monthly_report.do?method=displayReport&report=May-2012-ActiveAndExpiredCRPAcresByCounty-40

USDA, National Agricultural Statistics Service. 2007a. Census of Agriculture. State and County Profiles; Haskell County. Accessed 18 June 2012. Available online at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Oklahoma/

USDA, National Agricultural Statistics Service. 2007b. Census of Agriculture. State and County Profiles; Latimer County. Accessed 18 June 2012. Available online at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Oklahoma/

USDA, National Agricultural Statistics Service. 2007c. Census of Agriculture. State and County Profiles; McIntosh County. Accessed 18 June 2012. Available online at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Oklahoma/

USDA, National Agricultural Statistics Service. 2007d. Census of Agriculture. State and County Profiles; Muskogee County. Accessed 18 June 2012. Available online at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Oklahoma/

USDA, National Agricultural Statistics Service. 2007e. Census of Agriculture. State and County Profiles; Okmulgee County. Accessed 18 June 2012. Available online at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Oklahoma/

USDA, National Agricultural Statistics Service. 2007f. Census of Agriculture. State and County Profiles; Pittsburg County. Accessed 18 June 2012. Available online at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Oklahoma/

USDA, National Agricultural Statistics Service. 2007g. Quick Stats. Query for total Hay Acres Harvested in 2002 and 2007 at the county level. Accessed 19 June 2012. Available online at: http://quickstats.nass.usda.gov/.

USDA, National Agricultural Statistics Service. 2007h. 2007 Census Volume 1, Chapter 2: County Level Data. Oklahoma, Tables 11 and 12. Accessed 19 June 2012. Available online at: http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/Oklahoma/.

USDA, Natural Resources Conservation Service (NRCS). 1984. FPPA Rule, 7 CFR 658. Accessed 25 January 2012. Available online at: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1042433.pdf

USDA, NRCS. 2008a. Farmland Classification, Latimer County. USDA-NRCS mapping, Version 9, Sept. 12, 2008.

USDA, NRCS. 2008b. Farmland Classification, McIntosh County. USDA-NRCS mapping, Version 8, Sept. 5, 2008.

USDA, NRCS. 2008c. Farmland Classification, Muskogee County. USDA-NRCS mapping, Version 8, Sept. 16, 2008.

USDA, NRCS. 2008d. Farmland Classification, Okmulgee County. USDA-NRCS mapping, Version 7, Sept. 16, 2008.

USDA, NRCS. 2008e. Farmland Classification, Pittsburg County. USDA-NRCS mapping, Version 6, Sept. 16, 2008.

USDA, NRCS 2009. Farmland Classification, Haskell County. USDA-NRCS mapping, Version 8, Dec. 10, 2009.

USDA, NRCS. 2010. Grassland Reserve Program 2010 Activities and Accomplishments. GRP Obligations Map 2006-2010. Accessed online at: http://www.ok.nrcs.usda.gov/programs/grp/report.html

United States Energy Information Administration (U.S. EIA). 2010a. Electricity Data website. Sales, revenue, prices, and customers tables. Table 6: Class of Ownership, Number of Consumers, Sales, Revenue, and Average Retail Price by State and Utility: Residential Sector, 2010. Accessed 13 August 2012. Available online at: http://www.eia.gov/electricity/sales_revenue_price/xls/table6.xls.

U.S. EIA. 2010b. Natural Gas Data website. Summary Tables, Annual Company Level Data from Form EIA-176. Natural Gas Annual Respondent Query System. Accessed 13 August 2012. Available online at: http://www.eia.gov/cfapps/ngqs/ngqs.cfm?f_report=RP1

U.S. EIA.2011. Annual Energy Outlook 2011. Natural Gas. Table 65. Natural Gas Consumption by End-Use Sector and Census Division. Accessed 14 August 2012. Available online at: http://www.eia.gov/forecasts/archive/aeo11/source_natural_gas.cfm

USGS. 2011. NLCD 2006 Land Cover dataset. USGS, Sioux Falls, SD.