



**DEPARTMENT OF THE ARMY**  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101ST EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

March 20, 2006

Planning and Environmental Division  
Environmental Analysis and Compliance Branch

Dear Interested Party:

The Tulsa District has prepared an Environmental Assessment to assess the environmental and socioeconomic effects of the relocation of the golf course and camping/RV areas within the CrossTimbers development at Skiatook Lake, Oklahoma. This Environmental Assessment was developed in accordance with the National Environmental Policy Act, implementing regulations issued by the Council on Environmental Quality, and the U.S. Army Corps of Engineers Regulations, 33 CFR 230, Policy and Procedures for Implementing the National Environmental Policy Act. It was determined that this action will cause no significant adverse impacts on the natural or human environment.

An electronic copy of the Draft Environmental Assessment and Finding of No Significant Impact, on compact disk, is enclosed for your review and comments. For comments to be considered they must be received by this office on or before April 5, 2006. Comments should be directed to Mr. Stephen L. Nolen, Chief, Environmental Analysis and Compliance Branch, U.S. Army Corps of Engineers, Tulsa District, 1645 South 101<sup>st</sup> East Avenue, Tulsa, OK 74128-4609; Phone: 918-669-7660; Fax: 918-669-7546; Email: Stephen.L.Nolen@usace.army.mil.

Sincerely,

A handwritten signature in cursive script, reading "Stephen L. Nolen", is positioned above the typed name.

Stephen L. Nolen  
Chief, Environmental Analysis  
and Compliance Branch

Enclosure

**DRAFT**  
**FINDING OF NO SIGNIFICANT IMPACT**

In accordance with the National Environmental Policy Act (NEPA) of 1969, including guidelines in 33 Code of Federal Regulations, Part 230, the Tulsa District of the U.S. Army Corps of Engineers (USACE) has assessed the environmental impacts of the relocation of the proposed golf course and camping/RV area within the CrossTimbers Development Project at Skiatook Lake, Osage County, Oklahoma. The proposed action will allow the relocation of a golf course and a camping/RV area from their currently approved locations. Originally proposed for construction at Skiatook Point, the golf course would now be constructed in the Tall Chief Cove area of the lake. The camping and RV area, originally proposed for construction in the Tall Chief Cove area, would now be built at Skiatook Point.

As a means of minimizing adverse impacts to the American burying beetle (*Nicrophorus americanus*), a Federally-listed endangered species, standardized survey and other techniques prescribed by the U.S. Fish and Wildlife Service (USFWS) will accompany all construction activities involving excavation or soil disturbance. Changes to the location of the golf course and camping/RV area under the proposed action would impact additional terrestrial habitat that would require mitigation. In consultation with USFWS and other interested parties, USACE would reclassify property at Gouin Point on Skiatook Lake from recreation to wildlife management general to meet this mitigation requirement. This change in land classification by USACE would allow preservation of significant old-growth cross-timbers habitat at Gouin Point, allow hunting activities and management of habitat for wildlife and non-game species, and provide an additional degree of protection for the area from future development.

The environmental review of the proposed project, which is documented in the enclosed Environmental Assessment, indicates that no significant adverse environmental impacts on the natural and human environments would result from the proposed project. Therefore, an Environmental Impact Statement will not be prepared.

\_\_\_\_\_  
Date

\_\_\_\_\_  
MIROSLAV P. KURKA  
Colonel, U.S. Army  
District Engineer

Enclosure:  
Environmental Assessment

**ENVIRONMENTAL ASSESSMENT OF THE PROPOSED  
RELOCATION OF THE GOLF COURSE AND CAMPING/RV AREA,  
CROSSTIMBERS DEVELOPMENT PROJECT,  
SKIATOOK LAKE, OSAGE COUNTY, OKLAHOMA**

**March 20, 2006**

**Project Proponent:**

**Skiatook Economic Development Authority  
Skiatook, Oklahoma**

**Prepared for:**

**U.S. ARMY CORPS OF ENGINEERS  
TULSA DISTRICT  
TULSA, OKLAHOMA**

**Prepared By:**

**ALEXANDER CONSULTING, INC.  
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## **I. PURPOSE, NEED, AND SCOPE**

The purpose of this Environmental Assessment (EA) is to assess the environmental impacts from the proposed relocation of the golf course and camping/RV facilities within the CrossTimbers development area on Federal lands at Skiatook Lake in Osage County, Oklahoma. Although the Final Environmental Statement for Skiatook Lake, dated 11 February 1972, addressed the authorized recreational purposes at this location, significant excavation and changes in the land and current land use will result from the proposed construction activities, thus requiring preparation of an EA to ensure compliance with the National Environmental Policy Act (NEPA) of 1969, as amended.

Skiatook Reservoir was authorized for construction by the Flood Control Act approved 23 October 1962 (Public Law 87-874, 87<sup>th</sup> Congress) in accordance with a plan outlined in House Document No. 563 (87<sup>th</sup> Congress, 2<sup>nd</sup> Session). Purposes of the Skiatook project included flood control, water quality control, water supply storage, recreation, and fish and wildlife.

In 2003 the U.S. Army Corps of Engineers (USACE) approved the lease of approximately 631 acres of land and 46 acres of water located in portions of Sections 25, 26, 27 and 35 of Township 22 North, Range 11 East and Sections 2, 3, and 4 of Township 21 North, Range 11 East in Osage County, Oklahoma, to the Skiatook Economic Development Authority (Figures 1 and 2). As part of the approval of the lease request, USACE required the Skiatook Economic Development Authority (SEDA) to prepare an EA that addressed the environmental impacts of the proposed SEDA sub-lease of the property to StateSource, LLC for construction of the CrossTimbers development. Development in the lease area as part of the sub-lease to StateSource will include a golf course, marina, boat docks, trails, camping and RV sites, and a village. The village will consist of a lodge, cabins, store, and other related facilities. USACE approved the EA for the original CrossTimbers development, and on 13 February 2003 Colonel Robert L. Suthard, Jr. issued a Finding of No Significant Impact (FONSI) for the EA.

The primary purpose of this new EA is to address the relocation of the proposed golf course to the Tall Chief Cove area and the camping/RV site to the Skiatook Point area. The facility relocations, as herein proposed, are completely contained within the original and approved lease area.

## **II. ALTERNATIVES INCLUDING PROPOSED ACTION**

### **A. No Action.**

The No Action alternative would allow continued construction of the CrossTimbers development within the approved lease area at Skiatook Lake as outlined in the Environmental Assessment for CrossTimbers Project at Skiatook Lake, Oklahoma (original CrossTimbers EA) for which the USACE issued a Finding of No Significant Impact (FONSI) on February 13, 2003. Development would include a golf course located at Skiatook Point, marina, boat docks, trails, camping and RV sites at Tall Chief Cove, and a village (Figure 3).

The village would consist of a lodge, cabins, store, and other related facilities. As used in this document or accompanying attachments, the term “cabins” or “cabin development” refers to public cabins and lodging, restaurants, and retail and related facilities. The term “marina” refers to boat docks, storage, service ramps, parking areas, and service and repair facilities, as well as trails, restaurants, cabins, and retail and related facilities. Approved CrossTimbers construction that has taken place since issuance of the FONSI for the original CrossTimbers EA has consisted of a marina ship store, boat docks, associated marina storage, parking areas, trails, and a marina access road, primarily located in the Sunset Cove area.

### **B. Preferred Alternative (Proposed Action).**

Under the Preferred Alternative, both the golf course and the camping/RV area would be relocated from their currently approved locations. Originally proposed for construction at Skiatook Point, the golf course would now be constructed in the Tall Chief Cove area (Figure 4). The camping and RV area, originally proposed for construction in the Tall Chief Cove area, would now be built at Skiatook Point (Figure 5).

As a means of minimizing adverse impacts to the American burying beetle (ABB) (*Nicrophorus americanus*), a Federally-listed endangered species, standardized survey and other techniques prescribed by the U.S. Fish and Wildlife Service (USFWS) will accompany all construction activities involving excavation or soil disturbance. Accordingly, use of established protocol and activities for ABB protection is included as a component of the proposed action (Appendix A).

## **III. AFFECTED ENVIRONMENT**

### **A. Location.**

The proposed golf course would be constructed in the Tall Chief Cove area. The golf course would be built entirely within the approved CrossTimbers lease area on approximately 121 acres. The area near Tall Chief Cove has average slopes ranging from 6% to 12% and consists of approximately 21 acres of meadows and pasture and 100 acres of wooded terrain.

The proposed camping area and RV park would be constructed at Skiatook Point, which has average slopes ranging from 7% to 37% and consists of approximately 50 acres of meadows and pastures and 300 acres of woodlands.

### **B. Climate.**

Information regarding climatological conditions at Skiatook Lake has been previously summarized in Section III B of the original CrossTimbers EA.

### **C. Social and Economic Conditions.**

**1. Study Area.** Skiatook Lake is located in the southeastern portion of Osage County in north-central Oklahoma. The lake covers 10,190 acres and is owned and operated

by the U.S. Army Corps of Engineers. The Tall Chief Cove camping facilities are used at a 100% rate on weekends (turning away a number of individuals during the peak recreation season). Crystal Bay Marina, located on the north shore of the lake, operates at approximately 90% capacity during the boating season (May through September). The recently opened CrossTimbers Marina is currently operating at approximately 95% capacity.

**2. Population.** The population of Osage County was 44,437 as of the 2000 census. The Skiatook area has seen a growth rate of approximately 10% over the last 10 years.

**3. Employment and Income.** The economy of the area is based primarily on horse and cattle ranching as well as oil and gas production. The unemployment rate in Osage County was 4.0% in 2001 compared to 4.3% for the State. The 1999 per capita income for Osage County as \$17,634 compared to \$22,958 per capita for the State.

**4. Social Ecology.** Land use in the Skiatook Lake area is mainly ranching, although recent years have seen the slow encroachment of housing developments west of the town of Skiatook and on the eastern end of the lake. Upscale housing has been built on private property on both sides of the eastern end of the lake. Lakeview houses start at \$160,000 in the Catalina Cove subdivision east of Sunset Cove. Homes in East Ridge sell in excess of \$230,000. Westside homes in the Santa Barbara subdivision start at \$180,000 and homes in the Beverly Hills subdivision sell for a million dollars or more. At The Estates of CrossTimbers development, 0.5 acre lots sell for \$80,000 to \$160,000. The increase in housing prices has brought an increase in the amount of land that is being made available for development. The median price for a home in the Skiatook area is \$63,176 with an average home price of \$69,601. Only 3.3% of homes within a ten-mile radius of the Town of Skiatook sell for more than \$150,000 (Town of Skiatook Market Profile Report dated 15 June 2001).

**5. Environmental Justice.** Executive Order 12898 requires federal agencies to identify and address disproportionately high and adverse human health and environmental effects of federal programs, policies, and activities on minority and low-income populations. Federal agencies are directed to ensure that federal programs or activities do not result, either directly or indirectly, in discrimination on the basis of race, color or national origin. Federal agencies are required to provide opportunities for input in the NEPA process from affected communities and to evaluate significant and adverse environmental effects proposed federal actions on minority or low-income communities during the preparation of federal environmental documents. The proposed project was evaluated in accordance with E.O. 12898.

**6. Protection of Children from Environmental Health Risks and Safety Risks.** Executive Order 13045 requires that federal agencies make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. Federal agencies are directed to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health and safety risks. The proposed project was evaluated in accordance with E.O. 13045.

## **D. Natural Resources.**

**1. Terrestrial.** Information regarding terrestrial resources at Skiatook Lake has been previously summarized in Section III D.1. of the original CrossTimbers EA. There has been no change to the terrestrial resources since publication of the original CrossTimbers EA.

**2. Soils.** Information regarding soil types and soil associations present in the Skiatook Lake area has been previously summarized in Section III D.2. of the original CrossTimbers EA. There have been no changes to the soil types and soil associations since publication of the original CrossTimbers EA.

**3. Prime Farmland.** As defined by the U.S. Natural Resources Conservation Service (NRCS) there are no Prime or Unique Farmlands within the proposed project area. A small area of prime farmland exists within the lease area downstream of Skiatook Dam, but none of this area will be impacted by activities associated with the proposed project action. A copy of the December 12, 2005 coordination letter from the NRCS with this information is located in Appendix B.

**4. Wild and Scenic Rivers.** No body of water in the Skiatook Lake watershed is a federally designated Wild or Scenic River.

**5. Wetlands/Floodplains.** Information regarding wetlands and floodplains in the Skiatook Lake area has been previously summarized in Section III D.5. of the original CrossTimbers EA. There are no wetlands present in the proposed project area.

**6. Wildlife.** Information regarding wildlife present in the Skiatook Lake area has been previously summarized in Section III D.6. of the original CrossTimbers EA. Animal species present in the area are typical of the cross timbers region in Oklahoma and southern Kansas.

**7. Unique Habitat Resource.** The project area contains cross timbers, which is an increasingly rare and unique habitat type. This component was identified as being present in the project area during preparation of the final environmental statement for the project in 1972. The status of this habitat type has recently been of increasing concern and the focus of recent research by the scientific community.

The cross timbers originally stretched from southeast Kansas, through eastern Oklahoma, and into northeastern Texas. This vegetation type is dominated by blackjack oak, post oak and, in the south, black hickory (*Carya texana*), with an understory dominated by little bluestem. Subdominants include big bluestem, side-oats grama, hairy grama (*Bouteloua hirsuta*), purple lovegrass (*Eragrostis spectabilis*), sand lovegrass (*E. trichodes*), Scribner's panicum (*Panicum oligosanthes*), Indian-grass (*Sorghastrum avenaceum*), longleaf dropseed (*Sporobolus* sp.) and Texas needlegrass (*Stipa leucotricha*) as understory, and hackberry (*Celtis* spp.) as an overstory species. In Oklahoma, the cross timbers prairie habitat type originally covered approximately 30,000 square miles. Throughout much of the eastern range of the cross timbers a combination of fire suppression, plant invasion, and

conversion to agriculture has resulted in the fragmentation and loss of habitat for many migrant songbirds such as the endangered black-capped vireo. Therrell and Stahle (1998) estimate 162 square miles of ancient cross timbers remain today throughout the country, all of which has been impacted by fire suppression, grazing/agriculture, and reservoir impoundment.

Within the general habitat classification of cross timbers there are several different plant communities. The plant community with the broadest distribution is that of the upland cross timbers. The upland cross timbers forest type is generally considered to be a modified version of the oak-hickory forest type that is common along the western portion of the eastern deciduous forest of North America, the major distinction being the lack of the other species of oak and hickory common in eastern North America as well as the lack of black cherry and basswoods. In many places throughout the cross timbers region sandstone or limestone caps many of the hills. Soils associated with the sandstone caps are mostly thin sandy soils that contain unique plant assemblages generally consisting of small annuals and/or succulent perennials with very short taproots, or shallow spreading roots.

One component of this type of habitat is old growth, or ancient cross timbers, which is composed in part of trees that may be 300 to 500 years in age. Tree ring investigations indicate that the ancient cross timber community has remained relatively unchanged following the last glacial period some 6,000 years ago (Stahle et. al. 2000). Due to the rapidly declining trends in this habitat type the value and function of the old growth cross timbers is of special importance. Little is known about the bird communities in these ancient forests.

To date, approximately 300 acres at Tall Chief Cove have been surveyed for ancient (old growth) cross timbers. Candidate trees (those trees possibly 200 years or older) identified in the Tall Chief Cove area and displaying physical characteristics common to old growth timber (including diameter in relation to soil quality, nubs or scars from branch loss, and treetops that are gone or partially gone) were entered into a Geographic Information System (GIS) database. A survey for ancient cross timbers at Skiatook Point has, as of completion of this document, not been completed. The old growth tree inventory of all lands under lease to SEDA is to be incorporated into the CrossTimbers Environmental Management Plan and will be utilized to avoid, to the maximum extent possible, disturbance of the ancient trees. Development activities at Skiatook Point will not begin until candidate trees have been identified and included in the survey GIS database. A preliminary site assessment conducted by SEDA and StateSource, LLC indicates that Skiatook Point exhibits a greater likelihood for the presence of old growth timber. A copy of the Tall Chief Cove old growth tree survey is included in Appendix D.

**8. USACE Project Land Allocation and Classification.** Property acquired by USACE as part of the development of a project is allocated in accordance with the authorized purpose for which they were acquired. Following guidance contained in Engineer Regulation 1130-2-550 and Engineer Pamphlet 1130-2-550, land is allocated by USACE into one of the following categories: a) operations, which consists of lands acquired in accordance with the authorizing documents for operation of the project (i.e. flood control, hydropower, water supply, etc.); b) recreation, consisting of separable lands acquired in accordance with

authorizing documents for public recreation; c) fish and wildlife, consisting of separable land acquired in accordance with authorizing documents for fish and wildlife management; and d) mitigation, which is land acquired or designated in accordance with authorizing documents to offset losses associated with the development of the project.

Allocated project lands are further classified to provide for development and resource management. This classification process refines the land allocations to allow full utilization of project lands based on public desires, legislative authority, and regional and project specific resource requirements and suitability. Land is classified into one of the following categories:

1) Project operations – includes those lands required for the structure, operations center, office, maintenance compound, and other areas that are used solely for project operations.

2) Recreation – includes those lands to be developed for intensive recreational activities by the visiting public, including developed recreation areas and areas for concession, resort, and quasi-public development.

3) Mitigation – only includes land acquired or designated specifically for mitigation.

4) Environmental sensitive areas – areas where scientific, ecological, cultural, or aesthetic features have been identified. Normally limited or no development of public use is contemplated on land in this classification.

5) Multiple resource management – lands managed for one or more of, but not limited to, these activities to the extent that they are compatible with the primary allocation(s) of the property:

a) Recreation-low density – low density recreation activities such as hiking, primitive camping, wildlife observation, hunting, or similar recreational activities.

b) Wildlife management general – fish and wildlife management activities.

c) Vegetative management – management activities for the protection and development of forest and vegetative cover.

d) Inactive and/or future recreation areas – recreation areas planned for the future or that have been temporarily closed.

6) Easement – lands for which USACE holds and easement interest but not fee title.

Information on the allocation and classification of lands at a project becomes part of the project master plan. The project master plan provides resource objectives based on project purposes, applicable Federal laws and regulations, regional needs, resource capabilities, and expressed public desires. Project master plans are used to guide future design, development, and management activities to obtain the greatest benefit through meeting the needs of the public and protecting and enhancing environmental quality.

## **E. Cultural Resources.**

As an area of research, the project area falls within the Southern Great Plains archeological province. A cultural-historic overview of the surrounding region is beyond the

scope of this report; however, a detailed account is given in various USACE publications. Most notable of these publications are The Archeology of the Proposed Skiatook Reservoir, Osage County, Oklahoma (Rohrbaugh and Wycoff 1969), An Historical-Cultural Assessment of the Skiatook Reservoir, Osage County, Oklahoma (Perino 1972), The Prehistory and Paleoenvironment of Hominy Creek Valley 1978 Field Season (Henry 1979), and The Prehistory and Paleoenvironment of Hominy Creek Valley 1979 Field Season (Henry 1982).

As documented in the original CrossTimbers EA, a series of cultural resources investigations and consultations were undertaken in 2002 as part of USACE compliance with Section 106 of the National Historic Preservation Act. Although no significant cultural resources were identified within the SEDA lease area during these investigations, two historic properties were identified on USACE property directly adjacent to the proposed camping area at Skiatook Point. One of these is a traditional cultural property known as Teepee Rock or Healing Rock (34OS679). Healing Rock is a large upright rock located on a ridge point overlooking Skiatook Lake. Originally located in Hominy Creek valley, the rock was moved to its present location by USACE at the request of the Quapaw and Osage tribes in order to prevent the rock from being inundated by Skiatook Lake. According to informants, Healing Rock is a traditional cultural property of significance to the Quapaw and Osage tribes due to association with some of the first Native American Church gatherings held in Osage County. Consultation with the Osage Nation and Quapaw Tribe by USACE in 2002 and 2003 revealed that both tribes still feel that Healing Rock is a significant traditional cultural property in spite of the fact that the rock is no longer located in its original setting. Based on information provided by the Osage Nation and Quapaw Tribe, USACE determined in 2003 that Healing Rock is eligible for listing on the National Register of Historic Places (NRHP) as a traditional cultural property. The other historic property located near Skiatook Point is a prehistoric burned rock mound (34OS678) located in the front yard of the USACE Skiatook Lake office. Based on the undisturbed nature of the site and the likelihood that it contains important information on subsistence activities of the prehistoric inhabitants of the area, USACE has determined that site 34OS678 is potentially eligible for listing on the NRHP and should be protected until such time that a formal determination of NRHP eligibility can be made.

One outcome of the government-to-government consultations between USACE and the Quapaw Tribe and Osage Nation in 2002 and 2003 was the creation of lease provisions and mitigation requirements to minimize potential impacts to the Healing Rock or other cultural resources that might be inadvertently discovered during the construction and operation of the CrossTimbers development. In order to allow public access to the site while minimizing the likelihood of inappropriate behavior at Healing Rock, the following provisions were agreed to by all parties: 1) an area 100 feet on all sides of Healing Rock and approximately 50 feet on either side of the Healing Rock access trail was excluded from the SEDA lease area; 2) the trail and excluded area around Healing Rock will be maintained as part of the maintenance agreement for the USACE Skiatook Lake office compound; and 3) provisions were established in the SEDA lease agreement (and any subsequent sublease agreement) to address future inadvertent discoveries of cultural resources within the entire SEDA lease area (Figure 5).

## **F. Threatened and Endangered Species.**

Threatened, endangered, or candidate species occupying Osage County, Oklahoma include the interior least tern (*Sterna antillarum*), whooping crane (*Grus Americana*), bald eagle (*Haliaeetus leucocephalus*), piping plover (*Charadrius melodus*), mountain plover (*Charadrius montanus*), and Neosho mucket (*Lampsilis rafinesqueana*). These species were identified as potentially occurring in the project area in the previously approved EA prepared for the CrossTimbers development.

Since the 2003 issuance of the original CrossTimbers EA, the U.S. Fish and Wildlife Service (USFWS) has noted the occurrence of the American burying beetle (ABB), a Federally-listed endangered species, in Osage County, Oklahoma. The ABB is a member of the beetle family Silphidae and is known to bury vertebrate carcasses for reproductive purposes as well as exhibit parental care of young. The ABB is fully nocturnal and active when nighttime temperatures consistently exceed 60 F. For the remainder of its life cycle (generally mid-May to late-September) the ABB remains in an inactive state buried at soil depths ranging from 6- to 36-inches (Anderson 1982, Kozol *et al.* 1988). Owing to its confirmed presence in Osage County and its highly mobile nature, the ABB may be present in portions of the project area during summer months. During the inactive season, it is possible that the ABB may exist buried in project area soils of suitable characteristics (see Appendix B). Critical habitat has not been designated for the ABB.

## **G. Water Quality.**

USACE has characterized the general water quality at Skiatook Lake as having macronutrients and trace metals at levels that warrant future monitoring but are not currently a cause for alarm (USACE 1998). Phosphorus concentrations are at levels high enough to consider the lake to be borderline mesotrophic/eutrophic. Mesotrophic lakes show some depletion of oxygen making them not always suitable for warm water fisheries, although productivity is good. Shifting land use patterns in the watershed could shift the entire lake into a higher trophic level (eutrophic). Eutrophic lakes show a reduction in aesthetics due to turbidity, but generally productivity does not limit the reservoirs ability to support warm water fisheries. The second area of awareness is trace metals. Mercury levels were above detection limits in five surface water samples. This survey provided water quality baseline data for Skiatook Lake with samples taken between April and November 1994.

Since 1994, the Oklahoma Water Resources Board (OWRB) has measured water quality in Skiatook Lake. Data gathered in 1996, 1999 and 2000 show that Skiatook Lake is still classified as mesotrophic, bordering on eutrophic. A mesotrophic to eutrophic lake is one that is indicative of moderate to high primary productivity and intermediate nutrient levels. In 1998, the Oklahoma Department of Environmental Quality (ODEQ) determined metals levels in fish at Skiatook Lake did not exceed the screening level or low consumption advisory level for metals toxicity. In 2005 ODEQ issued a state-wide fish consumption advisory for methylmercury toxicity which included Skiatook Lake. While methylmercury values present in fish tissues taken from Skiatook Lake do not exceeded the screening or low consumption advisory levels in 785:45-5-20 Oklahoma's Water Quality Standards, levels of methylmercury present in fish tissues taken from Skiatook Lake do exceed the USEPA

January 2001 published recommended criterion for methylmercury for protection of public health. Previously, Skiatook Lake was listed on the 1998 State of Oklahoma 303(d) list of impaired waters for pesticide from unknown sources. The most recent State of Oklahoma Integrated Report, dated 2002, shows that Skiatook Lake is impaired due to low dissolved oxygen from unknown sources only, with insufficient data to determine impairment due to pesticide at this time. Additionally, Skiatook Lake is identified as not meeting the criteria necessary to fully support warm water aquatic communities as described in 785:46-15-5, Implementation of Oklahoma's Water Quality Standards, Assessment of Fish and Wildlife Propagation support.

More recently, USACE conducted a water quality survey from March 2003 through September 2004 designed to update the 1994 USACE water quality survey. Results from this most recent survey indicate an increase in Secchi depth and total phosphorus. Trace metal results mirror those observed in 1994. A eutrophic classification is supported by nutrient and phytoplankton assemblage data with the reservoir trending towards having higher concentrations of total phosphorus relative to 1994 concentrations. Lake-wide the algal assemblage present in Skiatook Lake is dominated by diatoms and blue-green algae, comprising 41% and 44% respectively of the total algal assemblage. Table 1 lists the percent contribution of diatoms and blue-green algae present at sampling locations near the dam, at the mouth of Tall Chief Cove, and at Skiatook Point. The majority of the dominant diatoms within the reservoir are comprised primarily of filamentous forms, indicating a high abundance of food for zooplankton and zooplanktivorous fish (i.e. small fish which feed primarily on zooplankton). The dominant blue-greens include *Anabaena* spp., *Aphanizomenon* spp., and *Cylindrospermopsis raciborskii*.

**TABLE 1**

**Results of 2003 and 2004 Algal Assemblage Sampling at Skiatook Lake**

<b>Sample Location</b>	<b>Diatom %</b>	<b>Blue-Green %</b>
Near Dam	41%	44%
Tall Chief Cove	52%	35%
Skiatook Point	47%	39%
Lake-Wide Average	41%	44%

The dominate blue-greens present in Skiatook Lake are known to have the ability to produce anatoxin-a, which is a neurotoxin affecting the nervous system, and cylindrospermisin, which is a hepatotoxin affecting the liver. While there is no data

available to determine toxin production by blue-green algae in Skiatook Lake, the number of cells per milliliter present at the Dam, Skiatook Point, and Tall Chief Cove portions of the reservoir exceeded the World Health Organization (WHO) guidance level of 20,000 cells per milliliter from August - September 2003 and July - September 2004. Although the value of 20,000 cells per milliliter indicates a low risk of adverse health effects, WHO guidance recommends providing information to lake swimmers regarding possible adverse health effects (WHO 1999).

In general, the areas of awareness for Skiatook Lake are similar to those identified in 1994 by USACE relating to increasing nutrient levels, increases in trophic state, and trace metal concentrations in the reservoir (primarily methylmercury).

#### **H. Air Quality.**

The geographic area containing Skiatook Lake is in attainment and meets the National Air Quality Standards for criteria pollutants designated in the Clean Air Act. Consequently, a conformity determination in accordance with the U.S. Environmental Protection Agency (EPA) Conformity Rule is not required for the proposed action.

#### **I. Noise.**

Noise levels in the project area are consistent with an area that is experiencing a growth in population levels. Various housing areas are in the process of development and construction adjacent and nearby to the proposed project area. To the north of Skiatook Point (proposed camping/RV area) a variety of housing areas are currently being built. Multiple areas along the southern portion of Skiatook Lake are being cleared and developed for single residence housing.

### **IV. IMPACTS OF THE PROPOSED ACTION**

#### **A. Social and Economic Impacts.**

##### **1. Future Without Project Conditions.**

**a. Population.** Impacts to the population are expected to be identical under the “Future Without Project Conditions” and the “Future With Project Conditions”. It is expected that the project will have a minor but direct impact on the number of people living in Osage County. In general, population trends of the past decade should continue or may increase slightly in the area due to recent improvements and upgrades, such as the repaving of existing road surfaces and construction of new road networks. Additionally, Rural Water District No. 15 (RWD 15) has plans to upgrade the water system by installing a new 8 inch main line to the eastern portion of the lake.

The project will have a direct and positive impact on those individuals using the Skiatook Lake facilities. Although construction activities are expected to temporarily increase noise and traffic, the new facilities are expected to generate increased interest in the

area by others living in distant locales, which, in turn, will increase opportunities for the local population.

**b. Employment and Income.** Impacts to employment and income are expected to be identical under both the “Future Without Project Conditions” and the “Future With Project Conditions”. Projected construction will increase job opportunities in the area. When all phases of the project are in operation approximately 50 to 60 new jobs will be created, which would make CrossTimbers one of the major employers in the local area. In the long-term, unemployment rates should remain slightly lower than average state rates. However, construction related expenditures should increase local incomes. Income for local residents should remain slightly lower than in other more urbanized areas of Oklahoma.

**c. Social Ecology.** Impacts to social ecology are expected to be identical under both the “Future Without Project Conditions” and the “Future With Project Conditions”. The project will be consistent with the local development. The eastern end of Skiatook Lake has seen an increase in housing development in the last 5 to 10 years. The Estates at CrossTimbers subdivision has recently placed on the market a total of 64 lots, each consisting of 0.5 acres, to the northeast of Sunset Cove. RWD 15 reports that an additional 20 new homes have been built in close proximity to the leased property in the last 5-10 years and 300 new houses were built in the general area over the last 5-10 years.

RWD 15, which receives water from the Town of Skiatook, will provide potable water to the area and currently has plans to upgrade their delivery system. RWD 15 has a 2000 acre-foot future use water storage contract at Skiatook Lake. This storage is from the originally authorized water supply storage. As the proposed project is developed, RWD 15 will activate the water storage contract from future use to a present use status. The town of Skiatook would treat water from water storage at RWD 15 to insure that the demands for the phased development of the proposed project are met. Water to irrigate the golf course will be purchased from RWD 15 and supplemented as needed with Skiatook Lake water.

Onsite sewage treatment will be handled via an aerobic system. The system(s) installed will comply with all applicable state and federal laws and regulations regarding wastewater treatment.

Traffic flow to the area will come from the North on SH 20 either via Lake Road or via Rogers Blvd and from the South via W. 103<sup>rd</sup> St. to Lake Road. This is the normal traffic pattern today. As previously discussed, noise in the area is expected to temporarily increase during the construction phase.

The aesthetics of the proposed development are of utmost importance. The proposed CrossTimbers project will be built consistent with its surroundings, with existing facilities in Oklahoma and Missouri being used as templates for project design. The standard of living will also benefit from the development via an increase in employment and land values.

## 2. Future With Project Conditions.

**a. Population.** Impacts to population under the “Future With Project Conditions” are expected to be identical to those identified for the “Future Without Project Conditions”. The scope of development at CrossTimbers will be the same, the only difference being the location of the golf course and camping area.

**b. Employment and Income.** Impacts to employment and income under the “Future With Project Conditions” are expected to be identical to those identified for the “Future Without Project Conditions”. The scope of development at CrossTimbers will be the same, the only difference being the location of the golf course and camping area.

**c. Social Ecology.** Impacts to social ecology under the “Future With Project Conditions” are expected to be identical to those identified for the “Future Without Project Conditions”. The scope of development at CrossTimbers will be the same, the only difference being the location of the golf course and camping area.

**d. Environmental Justice.** In accordance with Presidential Executive Order 12898, a review of this project was evaluated in terms of its effect of excluding persons (including populations) from participating in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination because of their race, color, or national origin. The review indicates that no such effects will result from the project.

**e. Protection of Children from Environmental Health Risks and Safety Risks.** In accordance with Presidential Executive Order 13045, a review of this project was evaluated in terms of any health risks and safety risks that may disproportionately affect children. The review conducted indicates, at present, a low to moderate environmental health risk to children due to the presence of blue-green algae at cellular densities high enough to merit administrative action (WHO 1999) and capable of producing neurotoxins (nerve toxins) and hepatotoxins (liver toxins). Symptoms experienced due to acute exposure to neurotoxins could possibly include muscle cramps, twitching, paralysis, cardiac or respiratory failure, death in animals (WHO 1999, NOAA 2005). Symptoms experienced due to acute exposure to hepatotoxins could possibly include nausea, vomiting, and acute liver failure (WHO 1999, NOAA 2005). It is recommended that information regarding possible adverse health effects related to primary and secondary water contact be posted at public use facilities within the lease area consistent with USACE public notice practices.

### B. Natural Resources Impacts.

**1. Terrestrial.** Temporary disturbance to soils and existing vegetation will occur from construction activities (i.e., shaping, excavation, installation of sod and turf). With the exception of the buffer zones around its perimeter, a large percentage of the 121 acres in the golf course will be disturbed during construction. Additionally, other potentially disturbed acreage will include 40 acres for the Village, 5 acres for the marina, and 59 acres for the camping/RV Park extension with a modest additional development occurring within

the balance of the project area for trails and other facilities as detailed in the development plan. Approximately three-quarters of the total area is timbered and the remaining one-quarter is open prairie land and aquatic habitat (see Table 2).

TABLE 2							
ESTIMATED WILDLIFE HABITAT TYPE TO BE ALTERED BY THE PROPOSED PROJECT							
	PRAIRIE	INTERSPERSED FOREST	FOREST EDGE	CLOSED CANOPY FOREST	RIPARIAN	AQUATIC	TOTAL
<b>GOLF COURSE</b>	21 acres (17%)	0 acres	5 acres (4%)	95 acres (79%)	0 acres	0 acres	121 acres (52%)
<b>MARINA</b>	0 acres	0 acres	0 acres	3 acres (9%)	2 acres (5%)	30 acres (86%)	35 acres (15%)
<b>VILLAGE</b>	8 acres (20%)	0 acres	2 acres (5%)	30 acres (75%)	0 acres	0 acres	40 acres (17%)
<b>RV/CAMPING</b>	0 acres	0 acres	3 acres (10%)	54 acres (90%)	2 acres (3.5%)	0 acres	59 acres (23%)
<b>TRAILS</b>	0 acres	0 acres	0 acres	5 acres (100%)	0 acres	0 acres	5 acres (2%)
<b>TOTAL</b>	29 acres (13%)	0 acres	10 acres (4%)	187 acres (72%)	4 acres (1.5%)	30 acres (13%)	260 acres (100%)

While detailed construction plans for all CrossTimbers features have yet to be developed, conservative estimates of terrestrial habitat disturbance can be derived from total acreages noted in Table 2. Accordingly, approximately 200 acres of forest habitat, 4 acres of riparian zone, and 29 acres of prairie habitat would be potentially lost as a result of all CrossTimbers development features. These estimates can be considered worst-case as some habitat will remain upon completion of construction. However, habitat fragmentation in these areas may result in reduced ecosystem function despite the existence of some remaining habitat.

The development of the village, golf course, marina, and camping/RV park will, to the extent possible, avoid those areas with old growth cross timbers. Through the use of the Old Growth Tree Inventory, the golf course and village will be designed and developed to showcase the ancient trees through educational signage.

By locating the golf course in the Tall Chief Cove area and the combination primitive camping and RV area on Skiatook Point, the CrossTimbers development will be able to design around and safeguard the maximum amount of ancient trees possible.

**2. Prime and Unique Farmlands.** There are no Prime or Unique Farmlands located in the proposed project area.

**3. Aquatic and Wetlands.** Nutrient loading from fertilizer applications and contamination from pesticide use at the golf course should be minimal due to efforts taken to maximize the integration of existing undeveloped lands into the project design. A detailed Turf Management and Integrated Pest Management Plan will be used to properly apply

fertilizers, herbicides and pesticides (see golf course design guidelines in Appendix D). A buffer zone consisting of existing shoreline habitats, cross timbers, riparian species, natural plants and Bermuda grass should be ideal for natural assimilation and/or decomposition of possible pollutants. The native cross-timber trees, shrubs, and grasses in the buffer zone will serve as indicators of excessive herbicide application due to their sensitivity to these products.

**4. Fish and Wildlife.** The construction of a "target golf course" may benefit some wildlife species and adversely impact others. Foraging species may benefit from increased food availability provided by clearing of the underbrush. However, neotropical bird species that utilize the cross timbers could be adversely impacted. In coordination with USACE and USFWS, bird and small mammal habitat will be added where possible throughout the project. As with any construction project, some species will be displaced.

Other construction is proposed within the heavily used Tall Chief Cove area where wildlife has either been displaced or adapted to human occupancy.

**5. Migratory Birds.** The potential impacts of the proposed development to migratory birds have been evaluated. The change in camping and golf course locations within the existing SEDA lease should not impact the USACE ability to protect migratory birds from deleterious impacts. According to information contained in the document Partners in Flight, Bird Conservation Plan for the Osage Plains (Physiographic Area 33, American Bird Conservancy, Version 1.0, October 2000), the physiographic area of the proposed development consists of grass-shrublands and Savanna-woodlands.

In grass-shrublands, the breeding bird species that appear to be increasing consist of the Bewick's Wren and Blue-gray Gnatcatcher, while declining species consist of the Western Kingbird, Eastern Kingbird, Scissor-tailed Flycatcher, Loggerhead Shrike, Bell's Vireo, Brown Thrasher, and Lark Sparrow. With or without the proposed development, this trend is expected to continue.

In Savanna-woodlands, the breeding bird species that appear to be increasing consist of the Wild Turkey, Eastern Bluebird, Indigo Bunting, Carolina Chickadee, Tufted Titmouse, White-breasted Nuthatch, and Carolina Wren. The declining species consist of the Redheaded Woodpecker, Northern Flicker, Western Kingbird, Eastern Kingbird, Scissor-Tailed Flycatcher, Loggerhead Shrike, and Brown Thrasher. Again, this trend is likely to continue with or without the proposed development.

**6. Impacts on Fishing and Hunting Opportunities.** An Aquatic and Terrestrial Mitigation Plan has been designed, approved by the USACE, and implemented.

Skiatook Point and Tall Chief Cove are part of the leased area. These areas are zoned for recreation use and are closed to hunting. The area from Skiatook Dam south to Tall Chief Cove (approximately 200 acres) was zoned for recreation-low density and had been used for archery-only hunting in accordance with Oklahoma Department of Wildlife Conservation (ODWC) regulations. Approximately 100 acres of this shoreline (in the vicinity of the marina and cabin developments) have been rezoned by USACE to recreation use to allow

currently approved development and are no longer open to hunting. The remainder of the shoreline (from the cabins to Skiatook Dam) remains zoned for recreation-low density.

The proposed use of this shoreline area (from the cabins to Skiatook Dam) for a trail would probably result in some seasonal restrictions on archery-only hunting activities. In consultation with the USFWS and ODWC, USACE has agreed to rezone approximately 300 acres in the undeveloped eastern portion of the Twin Points recreation area at Skiatook Lake from recreation to wildlife management general (Figure 1). Twin Points was originally purchased for development as a recreation area, but the planned recreation facilities were not constructed due to a lack of funding. Changing the classification of this portion of Twin Points to wildlife management general will allow hunting activities and management of habitat for wildlife and non-game species to take place on that portion of the lake, effectively offsetting the loss of hunting opportunities in the SEDA lease area. It will also provide an additional degree of protection for this area from future development considerations. USACE will continue to maintain responsibility for wildlife management activities at Twin Points.

**7. Threatened and Endangered Species.** The proposed action incorporates the use of standardized protocol (Appendix B) for minimizing adverse impacts to the endangered American burying beetle. These techniques will become a part of the Environmental Management Plan for the CrossTimbers development and will be employed in association with all construction activities. Surveys, relocation, and baiting away techniques (if applicable), and other standardized actions will be timed and phased relative to construction activities such that they meet current USFWS criteria for ABB protection. Accordingly, adverse impacts to the ABB as a result of this project should be minimal.

Adverse impacts to other listed threatened, endangered, or candidate species are not anticipated in association with the proposed action. These species are either not expected to occupy specific project lands or are temporary migrants through the area. No critical habitat has been designated for any of these species within the proposed project area. Correspondence regarding threatened and endangered species is included in Appendix C.

**8. Wetlands/Floodplains And Water Quality Permits.** No existing wetlands as identified by the USFWS (National Wetlands Inventory) will be impacted by the proposed project. All permanently habitable buildings will be located outside of the 50-year floodplain (2% chance of flooding over a given year). The project was coordinated with the Floodplain Management Section of the Tulsa District USACE in accordance with Executive Order 11988. The project will have no impacts on the floodplain of Hominy Creek.

All required Clean Water Act permits would be acquired prior to the start of any construction activities associated with the proposed project.

**9. Cultural Resources.** As part of compliance with Section 106 of the National Historic Preservation Act (NHPA), USACE reopened consultation with potentially interested Native American tribes regarding potential impacts to cultural resources from the proposed change in the CrossTimbers development plan in January 2005. Letters were

received later that same month from the Osage Tribal Council and the Quapaw Tribe of Oklahoma indicating a desire to consult with USACE on potential impacts to cultural resources as a result of the proposed CrossTimbers development changes (see Appendix D).

Cultural resources concerns expressed by the Quapaw Tribe and Osage Nation centered around potential impacts to Healing Rock (34OS679) and the burned rock mound (34OS678) located near Skiatook Point. Although neither of these historic properties are located within the actual SEDA lease, their close proximity to the proposed camping and RV areas at Skiatook Point raised concerns regarding the protection of these significant cultural resources from physical damage or vandalism by the public.

After a series of informal telephone conversations on the topic, representatives from USACE, StateSource, and the Osage Nation and Quapaw Tribe meet on January 13, 2006 to discuss tribal concerns and desires regarding the proposed project. As a result of this meeting, all parties agreed that protection and interpretation of historic properties at Skiatook Lake was desired and appropriate, and would be conducted under the following general guidelines: 1) StateSource would consult with the Osage Nation, Quapaw Tribe, and USACE on the interpretation of cultural and other natural resources throughout the CrossTimbers lease area. Examples of potential interpretation efforts discussed included Healing Rock, tribal names for natural and cultural features located along the proposed trail, construction history of Skiatook Lake, and general information on the prehistory of the area; 2) once constructed, StateSource would provide a permanent security presence in the proposed camping area at Skiatook Point, and would consult with all parties regarding the placement of any future security features or controls that might be considered for the area; and 3) that the results of the consultation meeting would be formalized as part of some sort of agreement document (MOA or MOU), and that any resulting guidelines or requirements would be incorporated into the CrossTimbers EMP as appropriate.

Because USACE, SEDA, StateSource, and the Osage Nation and Quapaw Tribe have agreed to work together to effectively protect and interpret cultural and natural resources in the CrossTimbers development area, USACE feels that the proposed modification to the CrossTimbers development plan will have no adverse effect on historic properties.

**10. Water Quality.** Surface water quality impacts associated with the proposed golf course could conceivably occur in two aquatic environments: (1) Skiatook Lake and (2) constructed surface waters on the golf course. Potential contaminants could be transported to these systems via surface or subsurface flows. Chemical constituents of potential concern include nutrients (nitrogen, phosphorus, potassium or N-P-K) from fertilizers, pesticides and herbicides, and sediment. Excessive nutrients are of concern in surface waters owing to their ability to promote excessive algae growth, which lowers the dissolved oxygen content of the water and poses potential health threats to swimmers. At elevated concentrations, pesticides and herbicides can negatively impact aquatic organisms or result in contamination of waters used for water supply purposes. Decreased water clarity, loss of storage capacity, and reduced aesthetics are among potential detrimental impacts associated with excessive sediment transport to surface waters.

The proposed golf course on Tall Chief Cove is estimated to occupy 121 acres. Topographic slopes on lands surrounding Tall Chief cove range from 6% to 12%. Features intended to mitigate potential water quality impacts would include a buffer zone of natural vegetation between the maintained turf and the water's edge that would average 125 feet in width for slopes less than 10% and average 200 feet for slopes greater than 10%. The recommended minimum buffer zone width in any topographic setting would not be less than 32 feet in width (Fischer and Fischenich 2000). Forests within the buffer zone may be selectively thinned to increase the amount of sunlight at ground level to promote dense cover vegetation. This vegetation will better retain and absorb sediment and nutrients, thereby decreasing amounts that might reach the lake. Natural vegetation will be enhanced with additional plant varieties (e.g. poplar and cottonwood trees, grasses such as buffalo and couch, ferns and other low-growing plants) that have been proven effective in absorbing N-P-K. These plant varieties have been successfully used downstream of cattle pastures to protect downstream water sources from potential sources of high nitrogen and total phosphorous concentrations (See "Using Buffers to Reduce Sediment," at [http://www.rivers.gov.au/acrobat/techguidelines/tech\\_guide\\_vo12\\_chapd.pdf](http://www.rivers.gov.au/acrobat/techguidelines/tech_guide_vo12_chapd.pdf) and "Conservation Buffers & Water Quality", <http://www.ent.iastate.edu/iprn/icrn/2000/6-12-2000/consbuffers.html>).

While desirable from a water quality standpoint, thinning of the buffer zone area could have an adverse effect upon the quality of the cross timbers ecosystem. Because the majority of the filtration of sediment and nutrients occurs within the first 32 feet of a buffer for low to moderate slopes (Fischer and Fischenich 2000) thinning will only occur within the first 32 feet of buffer strips when the total width of the buffer is greater than 40 feet. In areas where the buffer strip might be less than 32 feet in width infiltration trenches could be used to enhance the performance of the buffer zone next to the golf course as well as minimize the loss to ecosystem / buffer function.

Additional design features or construction techniques to supplement the buffer zone around the perimeter of the golf course would be further detailed in the CrossTimbers Environment Management Plan (EMP). The EMP would be updated as necessary as new information becomes available. At this time, design features being considered for implementation as part of the golf course design include:

(1) Man-made retention/detention ponds and other features to collect surface runoff and prevent potential contaminants, including N-P-K, pesticides and herbicides, and sediment from being transported to the lake. A study by Purdue University's Environmental Sciences and Engineering Institute determined that that proper use of fertilizers and pesticides on golf courses does not add any chemicals to surface or ground water. Purdue University Professor Zachary Reicher states, "In fact, the grass itself actually will use or trap most of the nutrients and chemicals contained in runoff from adjacent areas." See <http://news.uns.purdue.edu/html4ever/020708.Reicher.wetlands.html>

(2) Infiltration trenches adjacent to sand-based putting greens drained to gravel sumps or man-made water features. Small sedimentation ponds may be constructed upstream to reduce nutrient and sediment deposits from impacting the water quality of designed features.

(3) Berms and swales adjacent to or incorporated into tees, fairways, and roughs to direct and/or collect runoff discharged into man-made water features.

A Turf Management Plan, to be included in the CrossTimbers EMP, would specify types, amounts, and usage frequency of turf management chemicals to be used on the golf course. All applied products will be U.S. Environmental Protection Agency (EPA) approved. Chemicals considered for use would be non-persistent, short-lived, degradable, and non-mobile. Where practical, foliar applied liquid fertilizers will be used that are readily absorbed by the turf, thereby minimizing their availability for runoff. Granular fertilizers used to supplement liquid fertilizers would include those made by Nature Safe ([www.naturesafe.com](http://www.naturesafe.com)). These products include slow-release organic fertilizers enhanced with food energies from yeast, sugars, carbohydrates, proteins, fats, vitamins and enzymes. Together these ingredients increase the natural soil microbes that aid in turf rooting, stress tolerance and disease management. They also contain humus as a soil conditioner to buffer salts and improve the nutrient holding capacity of soils. They are low salt index organic fertilizers ideal for hot weather application to promote turf recovery and increase wear and stress tolerance. The cumulative effect of these types of products in turf management increases the performance of the turf to filter, trap, and absorb potential contaminants and sediment and prevent these contaminants from entering surface or ground waters.

The primary objective of the golf course's fertility program is to create a soil environment where sufficient nutrients are available for optimal plant health with minimal risk to water quality. Studies conducted by Michigan State University have proven that healthy turf along with thatch bind most all of the applied nitrogen. Unused nitrogen is consumed by microorganisms which, when they die, release nitrogen as complex forms of N that do not move downward to any extent in soils. Natural organic and slowly soluble fertilizers would be used in conjunction with liquid fertilizers. These forms of fertilizers are non-mobile and timed to release nutrients for staged uptake by the turf. In order to reduce the amount of nutrients having to be applied, mowing practices would include "grass cycling". Returning the grass clipping to the maintained turf provides four pounds of nitrogen, ½ pound of phosphorus and two pounds of potassium for every 100 pounds of dried grass clippings (according to North Carolina State University).

All products used on the CrossTimbers Golf Course would be thoroughly tested by the manufacturer and approved by the EPA prior to their usage. All applications would be made by a licensed applicator in accordance with State of Oklahoma requirements. Products would be selected for use based upon published charts listing maximum recommended application rate of active ingredient per acre and a leaching potential rate. Products used would be chosen to minimize risk of impacting water quality. No products would be applied within the natural buffer area between the maintained turf and Skiatook Lake.

Additional management programs to be detailed in the EMP include an Integrated Pesticide Management Plan, which would determine thresholds for pesticide usage, thereby reducing the availability of pesticides as a potential contaminant; and a fertilization system, which would be used to apply fertilizers on a continuous basis. This application process maximizes the absorption of fertilizers by plants, thereby reducing the availability of fertilizers as a potential contaminant to ground and surface waters.

In order to minimize or eliminate temporary impacts to water quality during the construction of the golf course, village, and other features, as well as during turf establishment, measures would be taken to reduce impacts (i.e. stormwater construction permits and appropriate protective measures). A stormwater management plan would be required during operation of the facility. All applicable laws and regulations concerning stormwater management would be followed during the construction and operation of the project.

In order to ensure water quality protection, sufficient detail regarding chemical application rates, qualifications and training of grounds maintenance and chemical application personnel, and other personnel involved in golf course operations would be provided in the EMP as described in Section V of this document.

**11. Air Quality.** The geographic area containing Skiatook Lake is in attainment and meets the National Air Quality Standards for criteria pollutants designated in the Clean Air Act. Conformity to the 1993 Conformity Rule (EPA) for ambient air quality is not necessary because foreseeable emissions from activities associated with the proposed project would not result in the regional air quality becoming a non-attainment area.

**12. Noise.** Construction of the golf course, camping and RV park, marina, and village would result in the temporary increase in noise levels in the project area. The types of construction equipment used in the project area (e.g., tractor, loader, backhoe) will generate noise levels of 80-90 dBA at a distance of 50 feet (Jones & Stokes 1998). The operation of construction equipment would vary from intermittent to fairly continuous, and many pieces of equipment may operate at the same time. Assuming a bulldozer (87 dBA), backhoe (90 dBA), and front-end loader (82 dBA) are operating simultaneously in the same area, peak construction-period noise could be approximately 94 dBA at 50 feet for the construction sites (Jones & Stokes 1998).

Although construction-related noise levels would occur in the construction areas of the project during the initial construction period, these effects are considered relatively minor for the following reasons: (i) construction noise effects will be temporary, (ii) the most intensive construction activities would occur over a relatively short period of time, and (iii) most construction would occur in areas that are not sensitive to noise.

### **C. Indirect and Cumulative Effects**

Indirect and cumulative effects of the proposed action alternative are nearly identical to those expected for the no action alternative, and have previously been identified and evaluated as part of the original approved CrossTimbers EA approved in 2003. Exceptions to the previously identified indirect and cumulative effects are detailed below.

Cumulative effects from construction of the proposed project include loss of natural habitat. Approximately 121 acres for the golf course would be placed under planned maintenance. Native species of plants and grasses would be used when practical.

Impacts to water quality (surface and ground water) and wildlife (flora and fauna) would depend on the quality of golf course design and maintenance. Excessive application of fertilizers could result in nutrient loading into the lake and/or nitrate contamination of ground water. The use of insecticides and herbicides could result in either temporary or sustained damage(s) to the terrestrial and aquatic ecosystems within and adjacent to the protected area, depending upon the types of product(s) used. Non-point source inputs to the lake and ground water from these applications would be moderated by the frequency of use, quantity per application, assimilation by vegetative ground cover, precipitation duration and frequency, soil drainage characteristics, and depth to bedrock. Because the project has been designed to minimize the use of fertilizers, herbicides, and pesticides by reducing the overall area of managed turf, significant cumulative effects from facility operations are not anticipated. Also, a Turf Management Plan and Integrated Pest Management program would be used to regulate the amount and types of products used.

It is anticipated that the golf course would increase traffic flow to the Tall Chief Cove area by 150 to 200 cars per day. Tall Chief Cove is accessible from the north and west via county road 1215 (Lake Road) off of State Highway 20. Skiatook Point is accessible from the south and east via W. 103<sup>rd</sup> St. from N. 52<sup>nd</sup> W. Ave. and State Highway 11. The Bureau of Indian Affairs (BIA) have extended N. 52<sup>nd</sup> W. Street from W. 103<sup>rd</sup> St. to 75<sup>th</sup> St. North to provide better access from the south to the west side of the lake. The existing campground at Tall Chief Cove and the CrossTimbers Marina are accessible from the lake access road. SEDA is working with county, state, and federal agencies to improve lake access and other roads in the area.

The Skiatook Lake project anticipated much greater development of recreational areas and larger visitor numbers than have occurred to date. The Final Environmental Statement prepared for Skiatook Lake identified a total of seven public use areas to be developed on 1,350 acres of USACE managed lands. The proposed lease area consists of approximately 47% of the acreage identified to be developed at the lake (631 acres of leased lands divided by 1,350 acres identified to be developed) and just over 3% of the total project lands and water comprising the Skiatook Lake project (677 acres of total lease area divided by 20,000 acres of USACE managed lands). Prior to construction an average annual visitation of 1,455,000 people was estimated for the lake, which would have been supported in part by the seven proposed public use areas. Visitation to Skiatook Lake has never approached that volume. Instead, annual visitation at Skiatook Lake has averaged slightly more than 586,000 during fiscal years 1999-2002. Cumulative impacts experienced at Skiatook Lake to date have not reached the levels originally contemplated.

Some land classification actions at Skiatook Lake have taken place in conjunction with the overall CrossTimbers development. As part of the approved original CrossTimbers EA, approximately 80 acres of land were changed from recreation-low density to recreation (20 acres for the CrossTimbers Marina and 60 acres for the adjacent cabin locations). As part of the requirements of the proposed action in this 2006 EA, USACE would agree to update the Skiatook Lake master plan to reclassify approximately 300 acres of undeveloped lands in the eastern portion of the Twin Points recreation area from recreation to wildlife management general as a means of offsetting the loss of hunting lands associated with the

CrossTimbers development. This change in classification would also provide an additional degree of protection from future development considerations.

## **V. MITIGATION REQUIREMENTS**

Much of the SEDA lease area that would be impacted by the CrossTimbers development is situated on lands already classified for recreation or recreation-low density purposes. However, the proposed development includes features such as a golf course, lodge, and cabins that were not originally envisioned for Skiatook Lake. Because they were not identified as anticipated recreation features, the potential impacts of these types of facilities were not considered during the original Skiatook Lake development and coordination with resource agencies under the provisions of the Fish and Wildlife Coordination Act and NEPA.

As part of the mitigation measures identified during preparation of the original EA for the CrossTimbers development, a requirement for 135 acres of terrestrial mitigation was identified based on the intensive use associated with the proposed changes in the types of construction activities and proposed development (see original approved EA and Appendix D). In consultation with SEDA, StateSource, USFWS, and ODWC, a comparable amount and type of terrestrial habitat located at Gouin Point on Skiatook Lake was reclassified from recreation to wildlife management general to meet this mitigation requirement.

Changes to the location of the golf course and camping/RV area under the proposed action in this EA would impact a total of 166 acres of terrestrial habitat that would require mitigation. Nearly all of this impact would be associated with the construction of the golf course and village. This impacted acreage would include the 135 acres already identified and mitigated for as part of the original EA for the CrossTimbers development. In consultation with SEDA, StateSource, USFWS, and ODWC, USACE would reclassify the remaining 120 acres at Gouin Point from recreation to wildlife management general to meet the additional 31 acre mitigation requirement. This change in land classification by USACE would allow preservation of significant old-growth cross-timbers habitat. It would also allow hunting activities and management of habitat for wildlife and non-game species to take place on that portion of the lake, and provide an additional degree of protection for the area from future development. USACE would continue to maintain responsibility for wildlife management activities at Gouin Point in consultation with USFWS and ODWC.

## **VI. FEDERAL, STATE, AND LOCAL AGENCY COORDINATION**

This draft Environmental Assessment is being coordinated with the following agencies having legislative and administrative responsibilities for environmental protection:

U.S. Fish and Wildlife Service  
Oklahoma Department of Wildlife Conservation  
U.S. Natural Resources Conservation Service  
Oklahoma Department of Environmental Quality  
Oklahoma State Historic Preservation Officer  
Oklahoma State Archaeologist  
Osage Nation  
Quapaw Tribe  
Wichita and Affiliated Tribes  
Kiowa Tribe  
Comanche Tribe  
Oklahoma State Conservationist  
Oklahoma Department of Tourism  
Oklahoma Department of Transportation  
Oklahoma Water Resources Board  
Oklahoma National Heritage Inventory  
City of Skiatook  
City of Tulsa  
City of Sand Springs  
City of Sapulpa  
Indian Nations Council of Government

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## VIII. REFERENCES

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- Henry, Donald O., 1982. The Prehistory and Paleoenvironment of Hominy Creek Valley: 1979 Field Season. Prepared for the US Army Corps of Engineers under Contract No. DACW56-77-C-0222. Laboratory of Archaeology, Department of Anthropology, University of Tulsa, Tulsa, Oklahoma.
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**IX. APPLICABLE ENVIRONMENTAL LAWS AND REGULATIONS**

**TABLE 3**

**RELATIONSHIP OF PLANS TO ENVIRONMENTAL PROTECTION  
STATUTES AND OTHER ENVIRONMENTAL REQUIREMENTS**

Policies	Compliance of Alternative
Federal	
Archeological and Historic Preservation Act, 1974, as amended, 16 U.S.C. 469, <u>et seq.</u> .....	All plans in full compliance
Clean Air Act, as amended, 42 U.S.C. 7609, <u>et seq.</u> ....	All plans in full compliance
Clean Water Act, 1977, as amended, (Federal Water Pollution Control Act) 33 U.S.C. 1251, <u>et seq.</u> .....	All plans in full compliance
Endangered Species Act, 1973, as amended, 16 U.S.C. 1531, <u>et seq.</u> .....	All plans in full compliance
Federal Water Protection Recreation Act, as amended, 16 U.S.C. 661, <u>et seq.</u> .....	All plans in full compliance
Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661, <u>et seq.</u> ... <b>All plans in partial compliance, additional coordination required</b>	
Land Water Conservation Fund Act, 1965, as amended, 16 U.S.C. 4601, <u>et seq.</u> .....	All plans in full compliance
National Historic Preservation Act, 1966, as amended, 16U.S.C. 470a, <u>et seq.</u> ... <b>All plans in partial compliance, additional coordination required</b>	
National Environmental Policy Act, 1970, as amended, 42 U.S.C. 4321, <u>et seq.</u> <b>All plans in partial compliance, additional coordination required</b>	
Native American Graves Protection and Repatriation Act, 1990, 25 U.S.C. 3001-13, <u>et seq.</u> .....	All plans in full compliance
Rivers and Harbors Act, 33 U.S.C. 401, <u>et seq.</u> .....	Not Applicable
Watershed Protection and Flood Prevention Act, as amended, 16 U.S.C. 1001, <u>et seq.</u> .....	Not Applicable
Wild and Scenic Rivers Act, as amended, 16 U.S.C. 1271, <u>et seq.</u> .....	Not Applicable
Water Resources Planning Act, 1965.....	Not Applicable
Floodplain Management (E.O. 11988) .....	All plans in full compliance
Protection of Wetlands (E.O. 11990) .....	All plans in full compliance
Environmental Justice (E.O. 12898) .....	All plans in full compliance
Protection of Children (E.O. 13045).....	All plans in full compliance
Farmland Protection Act, 7 U.S.C. 4201, <u>et seq.</u> .....	All plans in full compliance

Note: Full compliance-Having met all requirements of the statues, Executive Orders, or other environmental requirements for the current stage of planning. Statutes shown as plans being in partial compliance will be changed to full compliance upon completion of required agency and public coordination under NEPA.

## **X. LIST OF PREPARERS**

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------------	---------------------

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Randy Heckenkemper	Golf Course Designer
--------------------	----------------------

### **NORTHEASTERN STATE UNIVERSITY**

John Lamberton, PhD	Environmental Mediator
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### **ALEXANDER CONSULTING INC.**

Tom J. Alexander, PhD, PG	Principal-in-Charge
---------------------------	---------------------

### **OSAGE COUNTY**

Scott Hilton	Commissioner
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# SKIATOOK LAKE

PUBLIC HUNTING AREA

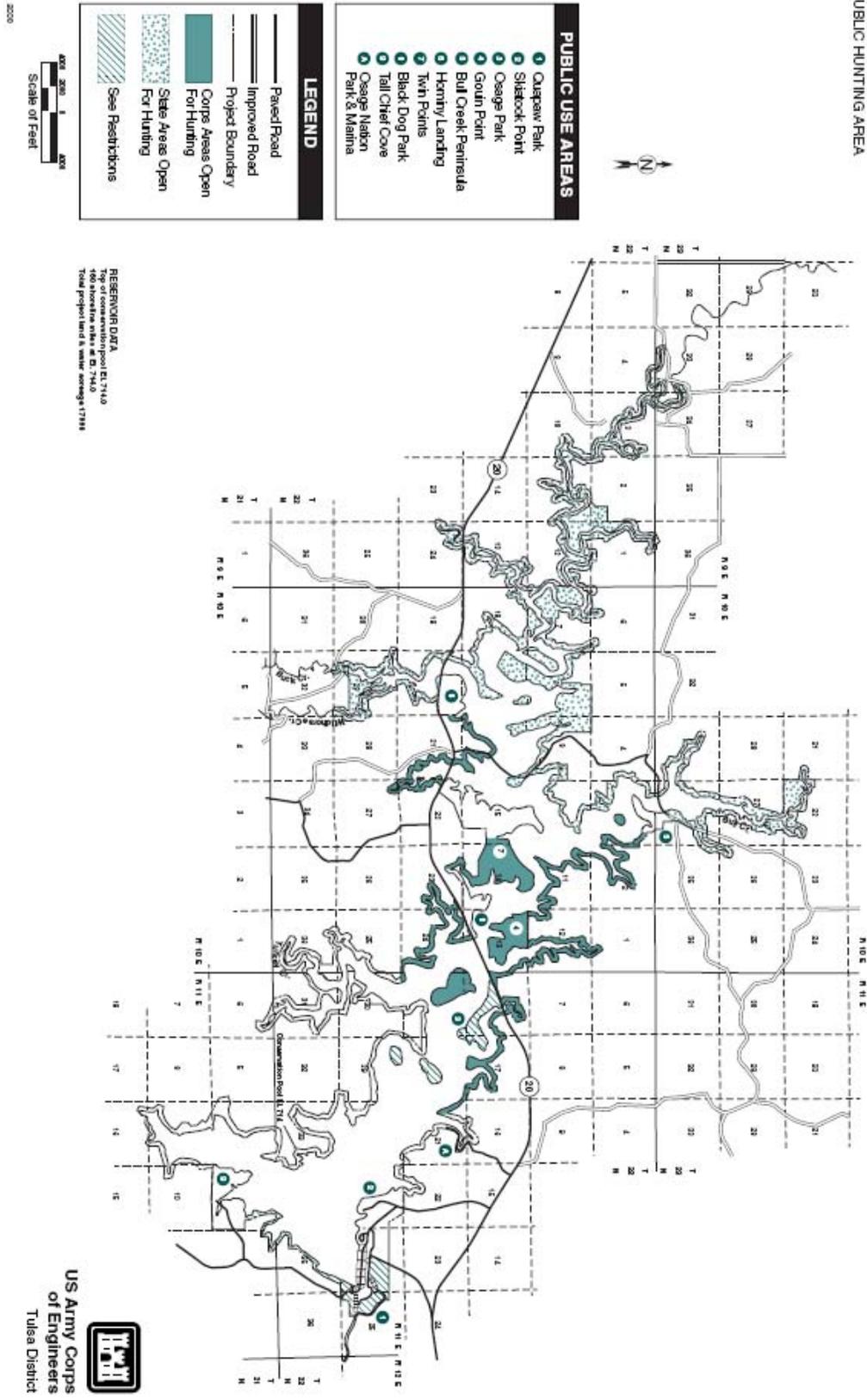
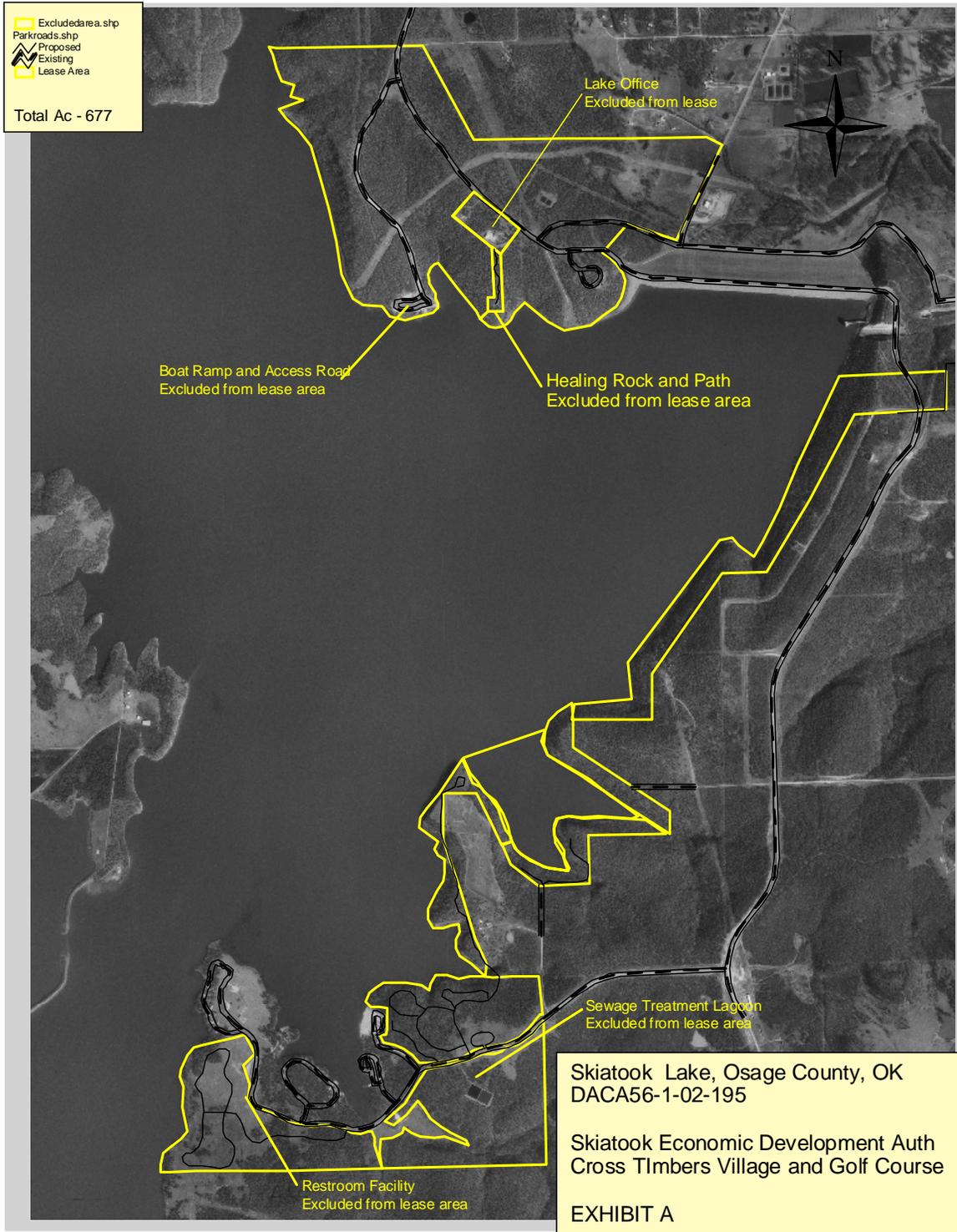
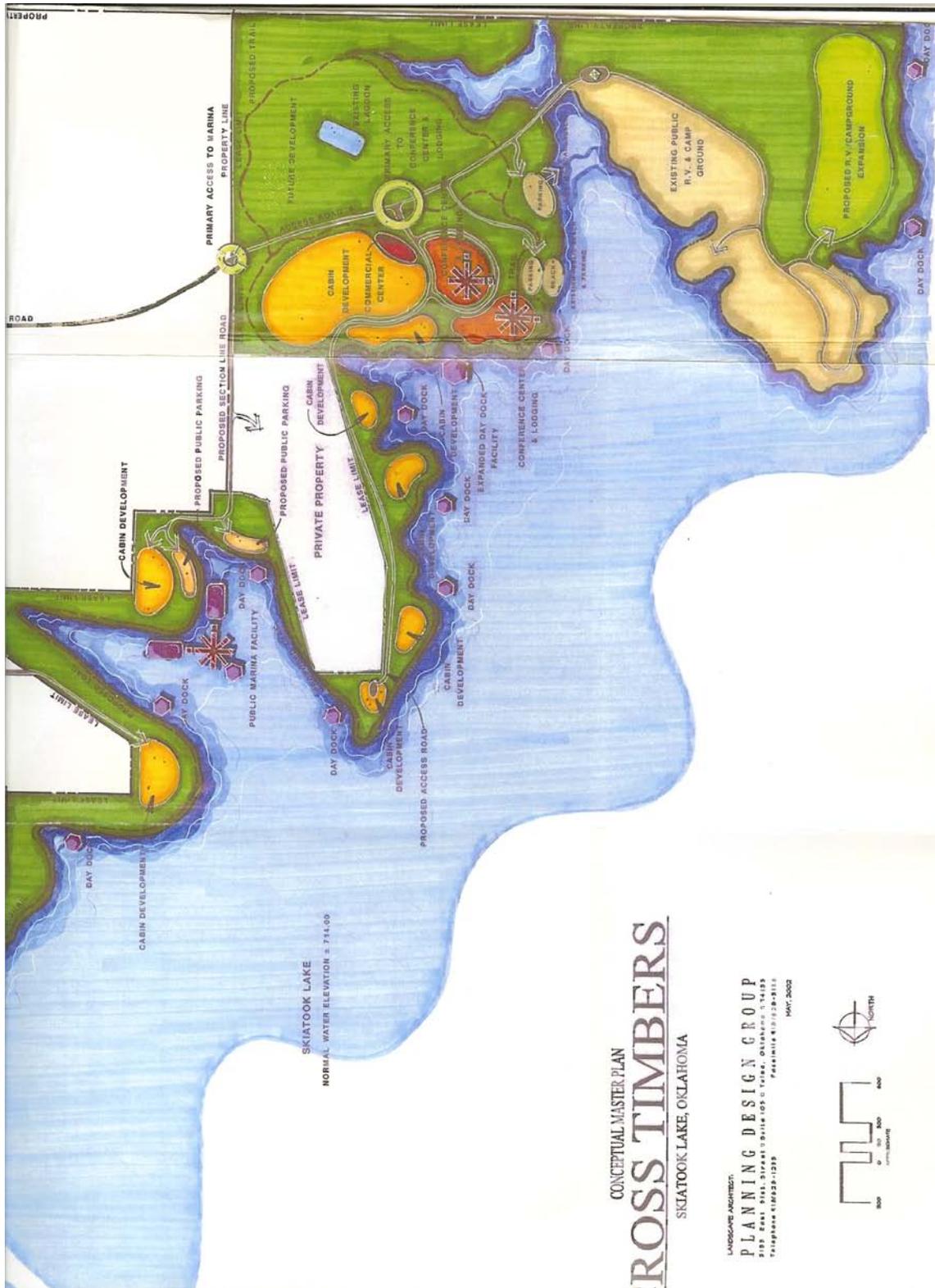


Figure 1. General Vicinity Map, Skiatook Lake, Osage County, Oklahoma

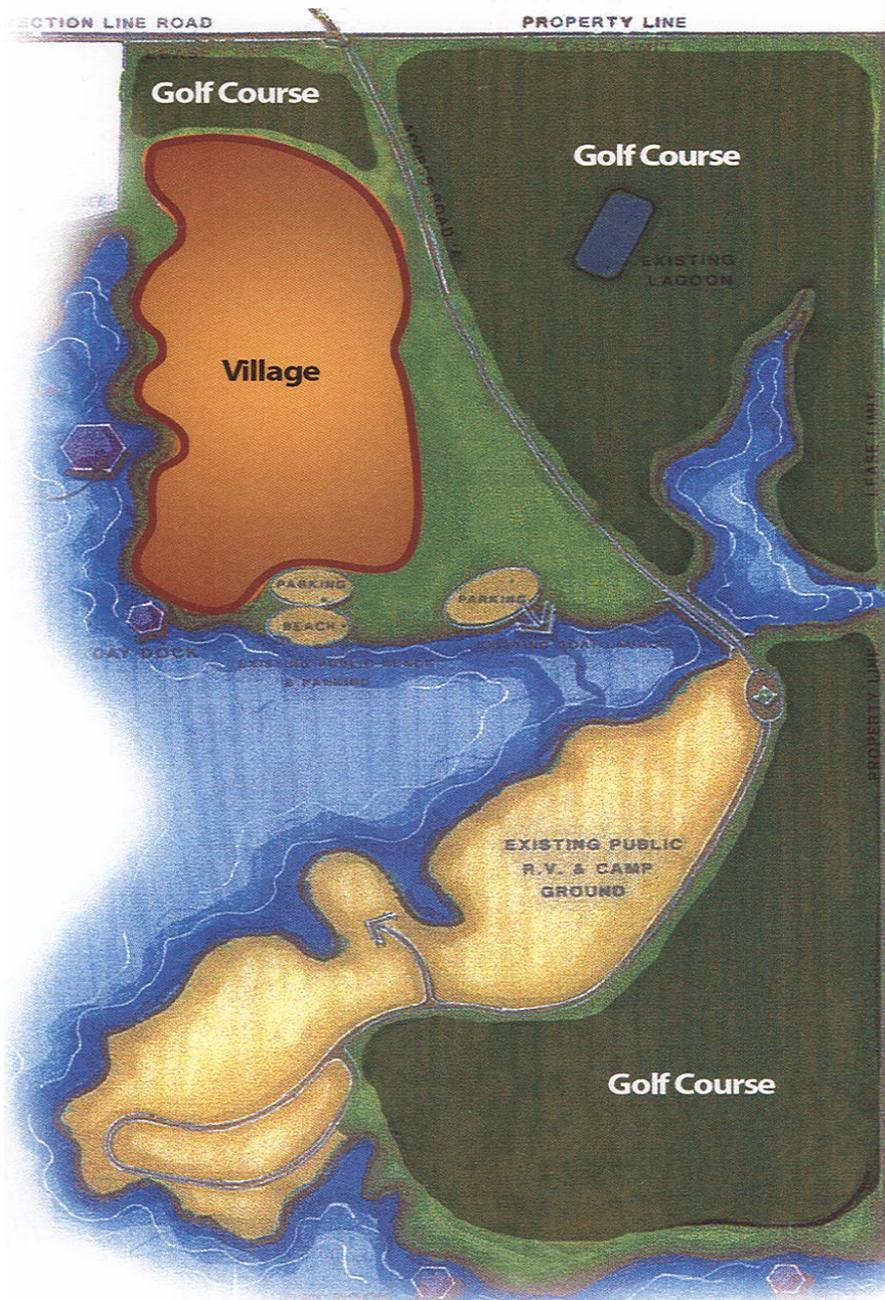


**Figure 2. Skiatook Economic Development Authority Lease Area**



**Figure 3. Conceptual Master Plan for CrossTimbers Development**

  
**Land Plan**



**Uses may be relocated within the lease area with the approval of the USACE**

**Figure 4. Proposed Golf Course at Tall Chief Cove**



**Figure 5. Proposed Camping Area at Skiatook Point**



**Figure 6. Significant Cultural Resources and Area Excluded from SEDA Lease**

# **APPENDIX A**

## **CONSTRUCTION BEST MANAGEMENT PRACTICES FOR MINIMIZING IMPACTS TO THE AMERICAN BURYING BEETLE**

## **Construction Best Management Practices (BMPs) for Minimizing Impacts to the American Burying Beetle (ABB)**

Source: Final Biological Opinion issued to Tulsa District Corps of Engineers by U.S. Fish and Wildlife Service (June 28, 2005)

The following description of construction BMPs for minimizing adverse effects to the ABB is included in the proposed action:

1. The Proponent will evaluate the likelihood of ABBs in the project area by reviewing the Service's county lists of Threatened & Endangered species at:  
<<http://ifw2es.fws.gov/Oklahoma/ctylist.htm>>
2. If the project site is in a county where the ABB *is not* listed, the Proponent will proceed without further precautions with regard to the ABB.
3. If the project site is in a county where the ABB is listed, the Proponent will evaluate the project area for ABB habitat. If the project site is confined to one or more of the following habitats, the Proponent will conclude that the habitat is not suitable for the ABB and proceed without further precautions with regard to the ABB.
  - Land that has already been developed and no longer exhibits surficial topsoil or leaf litter.
  - Land that is tilled on at least an annual basis.
  - Soil that is greater than 70% sand.
  - Soil that is greater than 70% clay.
  - Land where greater than 80% of the soil surface is comprised of rock.
  - Land where greater than 80% of the subsurface soil structure within the top 4 inches is comprised of rock.
  - Land that meets the US Army Corps of Engineers definition of wetland. (However, projects developed in this type of habitat will need to be reviewed by the Corps to ensure compliance with section 404 of the Clean Water Act.)
4. Projects in areas that exhibit suitable habitat for the ABB, *i.e.*, do not exhibit the above characteristics, will be evaluated by the Proponent for the presence/absence of the ABB in the immediate project area. This will be done by reviewing the Service's database of ABB surveys at: <<http://ifw2es.fws.gov/oklahoma/beetle1.htm>>.
5. If a nearby ABB survey (within a five-mile radius of the proposed construction site) is found, the Proponent will apply the survey results to the project site. If both positive and negative surveys are found to be applicable, positive surveys will always be applied over negative surveys.
6. If applicable survey results are negative for ABB occurrences, the Proponent will proceed with the project without further precautions with regard to the ABB.
7. If applicable survey results are positive for the ABB, the Proponent will proceed with the project as follows:

- Whenever possible, the Proponent will postpone construction until the active season of the ABB, *i.e.*, between May 20 and September 20, when nighttime temperatures average above 60°F. The Proponent will begin construction only after implementing the Service's current Baiting Away protocol or current Trapping and Relocating protocol whichever is determined more appropriate.
8. If there are no existing surveys applicable to the proposed construction site and the construction will occur during (or can be postponed until) the active season of the ABB, the Proponent will do either of the following:
    - Assume ABBs are present and utilize the Service's current Baiting Away protocol to proceed with the project.
    - Conduct an ABB survey of the project area.
  9. If an ABB survey of the project area is negative, the project will proceed without further precautions with regard to the ABB.
  10. If an ABB survey of the project area is positive, the Service's current Baiting Away protocol or current Trapping and Relocating protocol will be utilized and then the project will proceed.

# **APPENDIX B**

## **RESOURCE AGENCY COORDINATION INFORMATION**



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101ST EAST AVENUE  
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November 16, 2005

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Environmental Analysis and Compliance Branch

Mr. Greg Duffy, Director  
Oklahoma Department of Wildlife Conservation  
P.O. Box 53465  
Oklahoma City, OK 73152-3465

Dear Mr. Duffy,

This is to inform you that the Tulsa District has begun evaluating the potential impacts related to the relocation of recreation facilities proposed in a previous environmental assessment (EA) entitled, Environmental Assessment for CrossTimbers Project at Skiatook Lake, Oklahoma dated February 13, 2003, which can be found at the following website: <http://www.swt.usace.army.mil/library/library.cfm> The Skiatook Economic Development Authority (SEDA) and StateSource, LLC have altered development plans presented in the above referenced EA for Skiatook Point and Tall Chief Cove at Skiatook Lake, Oklahoma. The preferred alternative being assessed would include the development of a public golf course at Tall Chief Cove encompassing approximately 121 acres and the development of public camping facilities and an RV park at Skiatook Point encompassing approximately 350 acres.

We are currently in the process of gathering the most current information available regarding federally and state listed species potentially occurring within the project area. The project area consists of USACE property leased to SEDA located in portions of Sections 25, 26, 27, and 35 of Township 22 North, Range 11 East and Sections 2, 3, and 4 of Township 21 North, Range 11 East in Osage County, Oklahoma. We respectfully request that your agency provide a list of the protected species that may occur within or near the site. We also request a description of the sensitive resources (e.g., rare or unique plant communities, conservation landscapes) that you believe may be affected by the proposed project. Any information you may have regarding critical habitat areas for these species would also be greatly appreciated.

If you have any questions or require additional information, please contact Ms. Sandra Stiles at 918-669-7662 or Dr. Tony Clyde at 918-669-7556.

Sincerely,

A handwritten signature in blue ink, appearing to read "Stephen L. Nolen".

Stephen L. Nolen  
Chief, Environmental Analysis  
and Compliance Branch

Enclosure



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
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16 November 2005

Planning and Environmental Division  
Environmental Analysis and Compliance Branch

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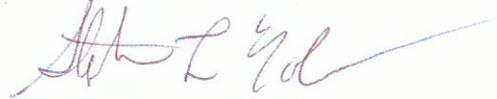
Dear Mr. Dominick,

This is to inform you that the Tulsa District has begun evaluating the potential impacts related to the relocation of recreation facilities proposed in a previous environmental assessment (EA) entitled, Environmental Assessment for CrossTimbers Project at Skiatook Lake, Oklahoma, dated February 13, 2003, which can be found at the following website: <http://www.swt.usace.army.mil/library/library.cfm> The Skiatook Economic Development Authority (SEDA) and StateSource, LLC have altered development plans presented in the above referenced EA for Skiatook Point and Tall Chief Cove at Skiatook Lake, Oklahoma. The preferred alternative being assessed would include the development of a public golf course at Tall Chief Cove encompassing approximately 121 acres and the development of public camping facilities and an RV park at Skiatook Point encompassing approximately 350 acres.

We are currently in the process of gathering the most current information available regarding prime and unique farm land potentially occurring within the project area. The project area consists of USACE property leased to SEDA located in portions of Sections 25, 26, 27, and 35 of Township 22 North, Range 11 East and Sections 2, 3, and 4 of Township 21 North, Range 11 East in Osage County, Oklahoma. We respectfully request that your agency provide an inventory of any prime farmlands which may occur within or near the site.

If you have any questions or require additional information, please contact Ms. Sandra Stiles, 918-669-7662 or Dr. Tony Clyde, 918-669-7556.

Sincerely,

A handwritten signature in red ink, appearing to read "Stephen L. Nolen", with a long horizontal flourish extending to the right.

Stephen L. Nolen  
Chief, Environmental Analysis  
and Compliance Branch

Enclosure



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101ST EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

16 November 2005

Planning and Environmental Division  
Environmental Analysis and Compliance Branch

Mr. Jerry Brabander, Field Supervisor  
U.S. Fish and Wildlife Service  
222 S. Houston, Suite A  
Tulsa, OK 74127

Dear Mr. Brabander,

This is to inform you that the Tulsa District has begun evaluating the potential impacts related to the relocation of recreation facilities proposed in a previous environmental assessment (EA) entitled, Environmental Assessment for CrossTimbers Project at Skiatook Lake, Oklahoma, dated February 13, 2003, which can be found at the following website: <http://www.swt.usace.army.mil/library/library.cfm> The Skiatook Economic Development Authority (SEDA) and StateSource, LLC. have altered development plans presented in the above referenced EA for Skiatook Point and Tall Chief Cove at Skiatook Lake, Oklahoma. The preferred alternative being assessed would include the development of a public golf course at Tall Chief Cove encompassing approximately 121 acres and the development of public camping facilities and an RV park on Skiatook Point encompassing approximately 350 acres.

In accordance with Section 7 of the Endangered Species Act of 1973, as amended, the District is requesting an official list of Federally listed threatened or endangered species which might be effected by the proposed action. The project area consists of USACE property leased to SEDA located in portions of Sections 25, 26, 27, and 35 of Township 22 North, Range 11 East and Sections 2, 3, and 4 of Township 21 North, Range 11 East in Osage County, Oklahoma. Pertinent information and a description of the proposed action are enclosed herein. If you have any

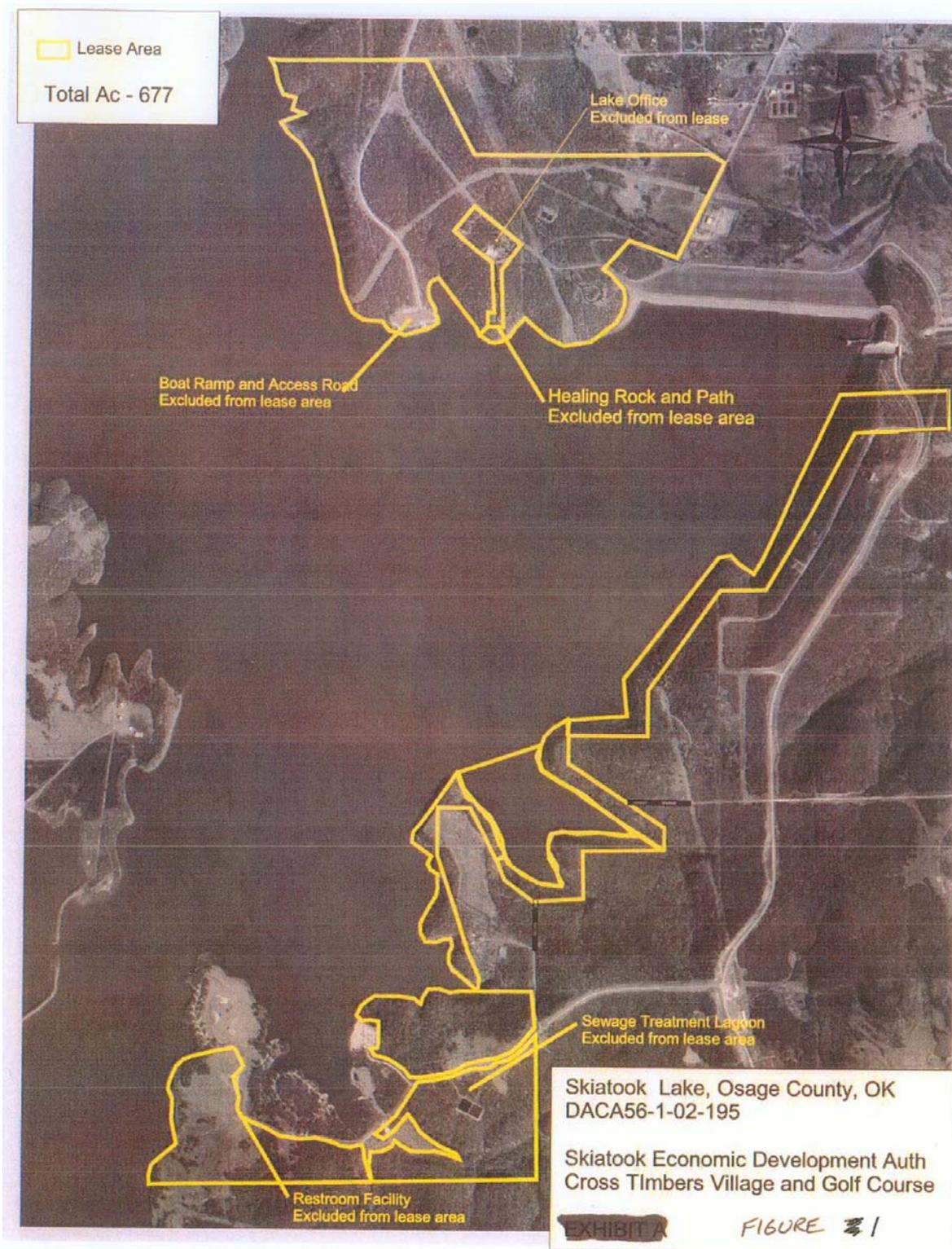
questions or require additional information, please contact Ms. Sandra Stiles, 918-669-7662 or Dr. Tony Clyde, 918-669-7556.

Sincerely,

A handwritten signature in dark ink, appearing to read "Stephen L. Nolen". The signature is fluid and cursive, with a large initial "S" and "L".

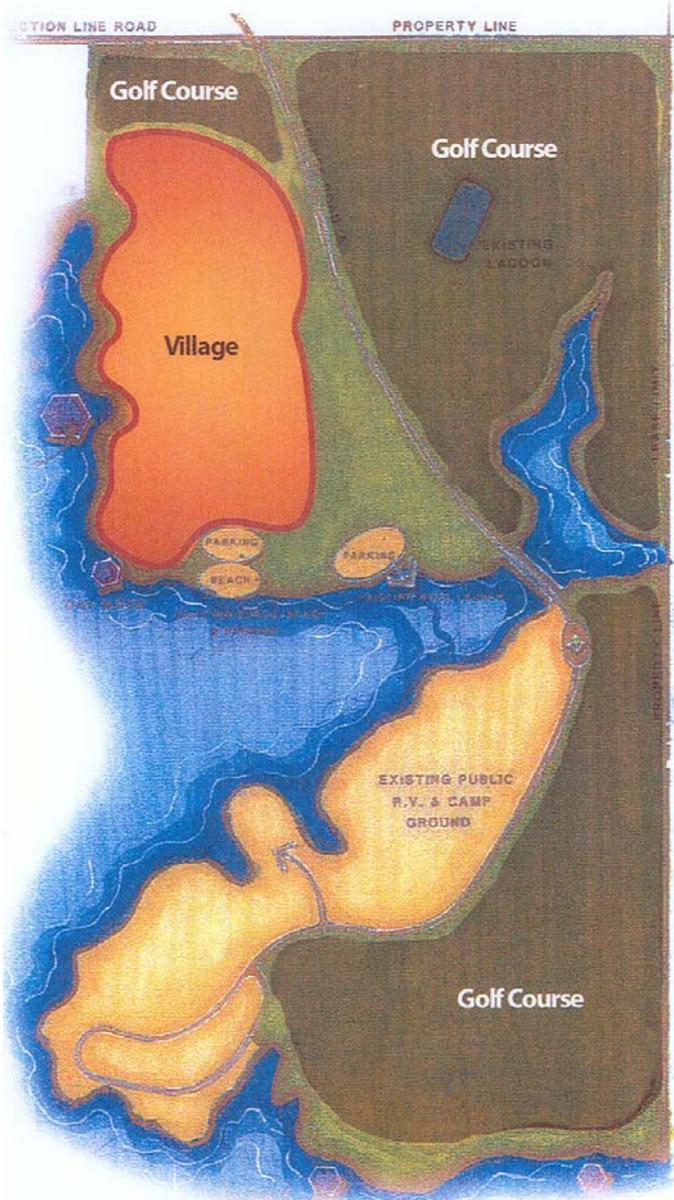
Stephen L. Nolen  
Chief, Environmental Analysis  
and Compliance Branch

Enclosure



  
**Land Plan**

FIGURE 2



Uses may be relocated within the lease area with the approval of the USACE



FIGURE 3



United States  
Department of  
Agriculture

Natural  
Resources  
Conservation  
Service

Natural Resource Conservation Service  
1000 W. Main, STE. 102  
RT. 1 Box 650  
PAWHUSKA, OK. 74056

12/12/05

Stephen L. Nolen  
Chief Environmental Analysis and Compliance Branch  
Department of the Army  
Corps of Engineers, Tulsa District  
1645 South 101<sup>ST</sup> East Avenue  
Tulsa, Oklahoma 74128-4609

RE: Environmental Assessment for CrossTimbers Project at Skiatook Lake, Oklahoma

Dear Mr. Nolen,

Enclosed is a list of all the soils in the sections that were listed in the letter of November 16<sup>th</sup>. The Soils Report shows the soil name, percent slope, chance of flooding, depth to rock and other things that might keep it out of being prime farmland. It also has the rating of wheter it is considered prime farmland or not. There are also maps of each of the sections showing where the soils are located. The symbols match those on the Soils Report list.

If you have any questions or want more information, please contact us.

Sincerely,

John Enfield  
Rangeland Management Specialist

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

## Soils Report

### Farmland Classification

**Soil Survey:** Osage County, Oklahoma

**Survey Status:** -

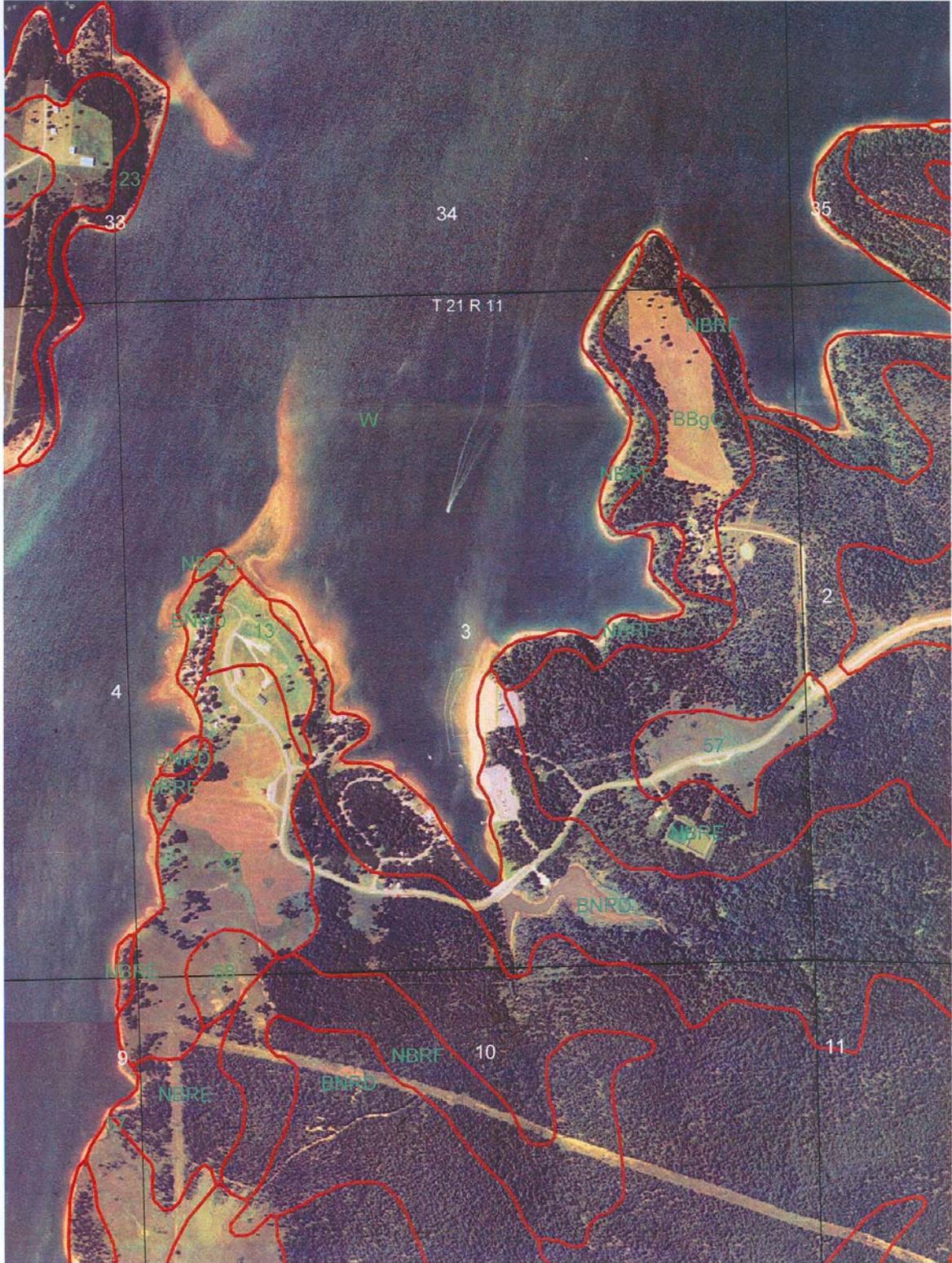
**Correlation Date:** 05/01/1975

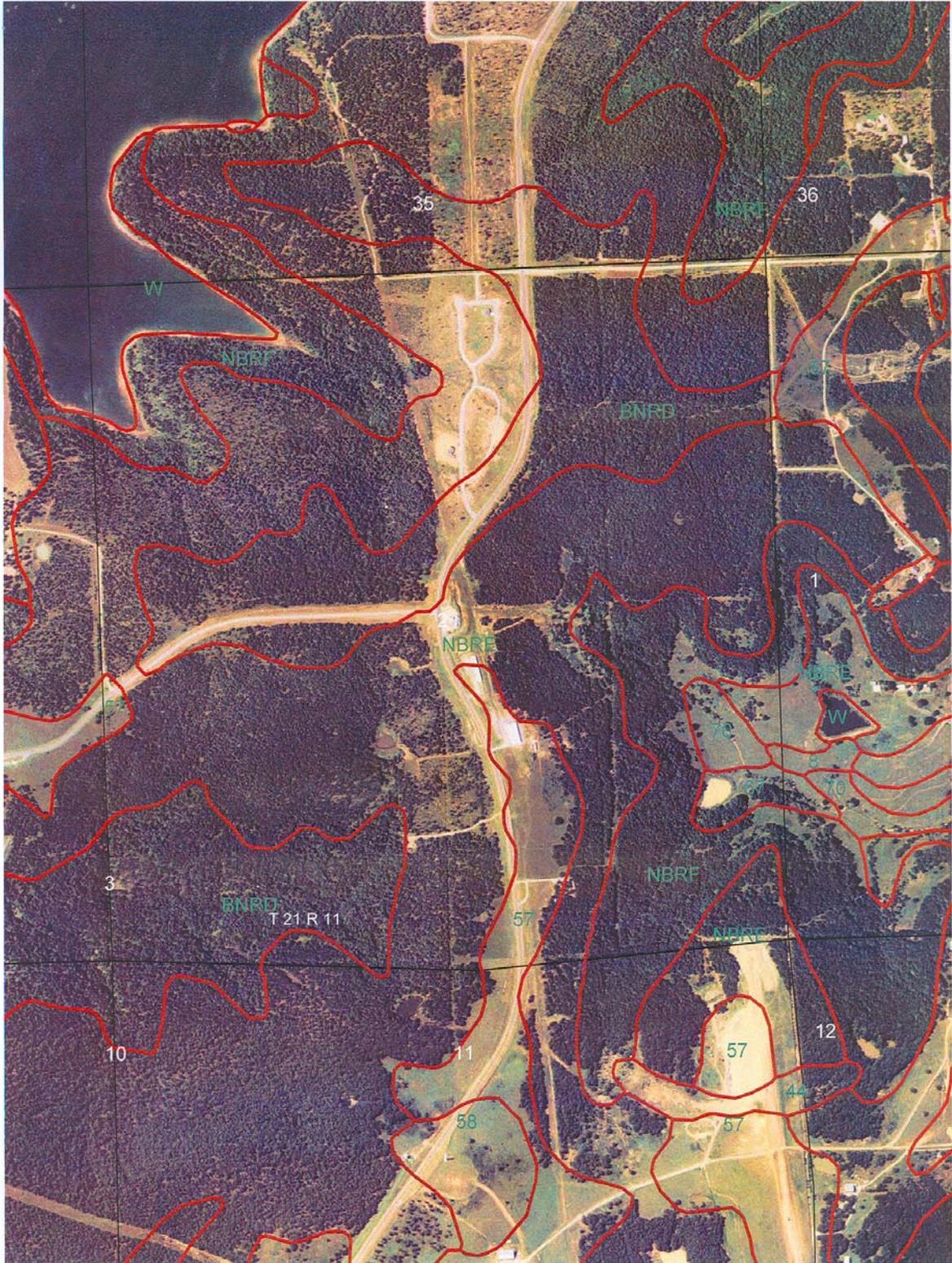
**Distribution Date:** 10/05/2004

**Map**

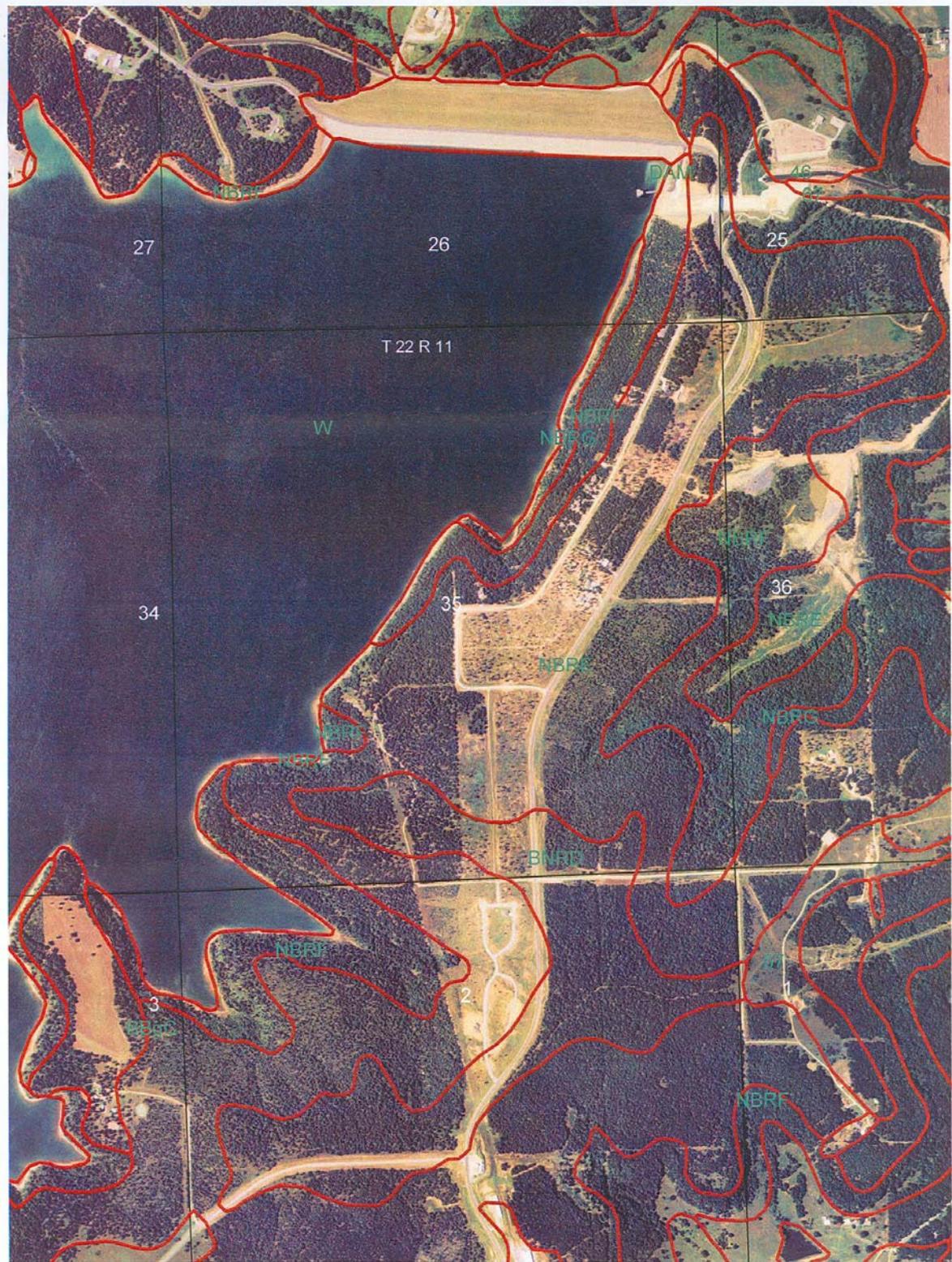
Symbol	Soil Name	Rating
8	Pocasset fine sandy loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
9	Pocasset fine sandy loam, 1 to 3 percent slopes, occasionally flooded	All areas are prime farmland
13	Lucien-Coyle complex, 3 to 8 percent slopes	Not prime farmland
23	Foraker-Shidler complex, 12 to 25 percent slopes	Not prime farmland
38	Norge silt loam, 1 to 3 percent slopes	All areas are prime farmland
39	Norge silt loam, 3 to 5 percent slopes	All areas are prime farmland
46	Osage silty clay, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
57	Steedman-Lucien complex, 3 to 15 percent slopes	Not prime farmland
58	Steedman-Lucien complex, 15 to 25 percent slopes	Not prime farmland
66	Verdigris silt loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
67	Verdigris silt loam, 0 to 1 percent slopes, frequently flooded	Not prime farmland
70	Wynona silty clay loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
BBgC	Bartlesville-Bigheart complex, 1 to 5 percent slopes, very rocky	Not prime farmland
BNRD	Bigheart-Niotaze-Rock outcrop complex, 1 to 8 percent slopes	Not prime farmland
NBRE	Niotaze-Bigheart-Rock outcrop complex, 3 to 15 percent slopes, very stony	Not prime farmland
NBRF	Niotaze-Bigheart-Rock outcrop complex, 15 to 25 percent slopes	Not prime farmland

NBRG      percent slopes, extremely stony  
Niotaze-Bigheart-Rock outcrop complex, 25 to 45 percent slopes, rubbly      Not prime farmland



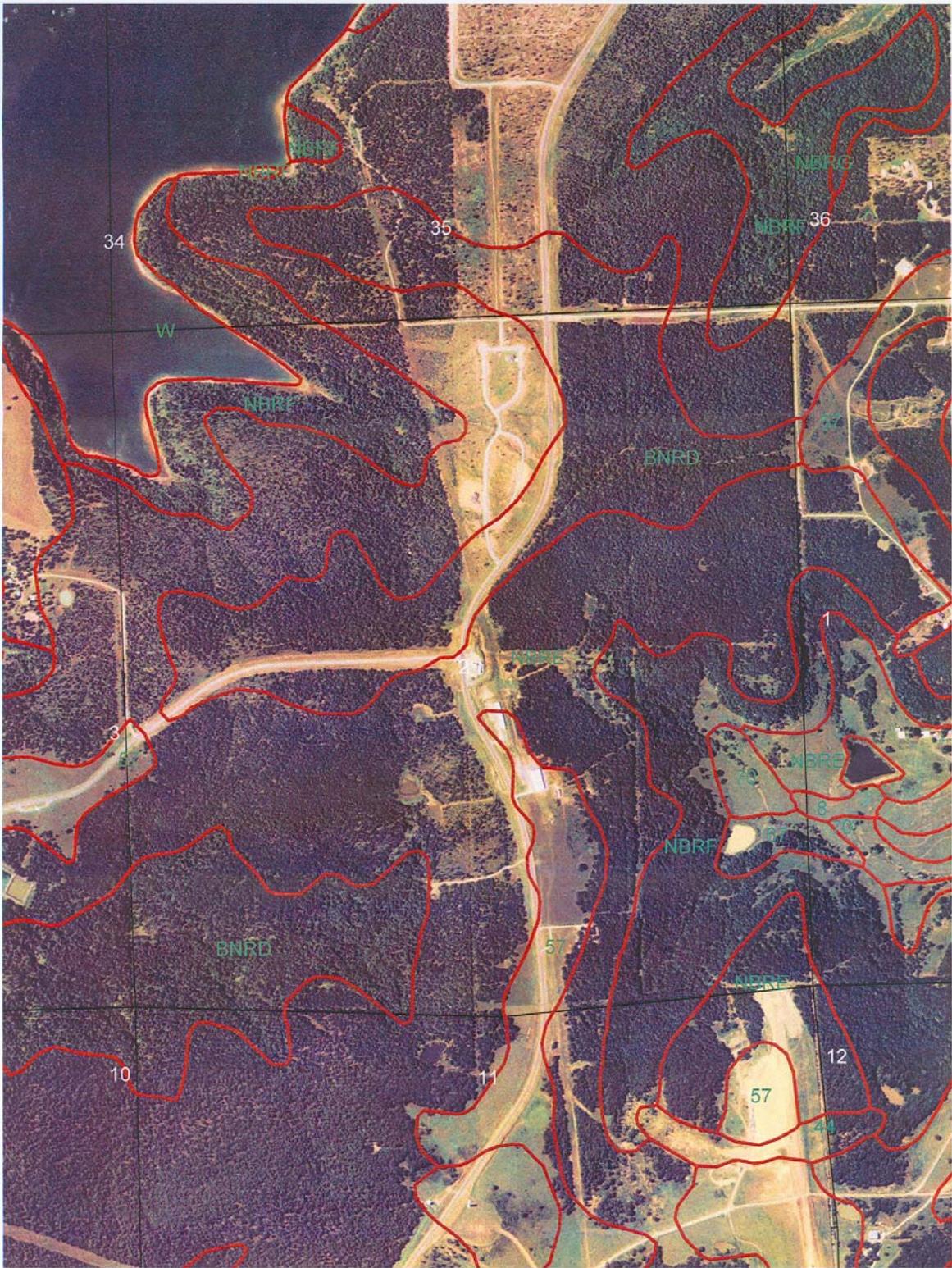














DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101ST EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

DEC 16 2005

Planning and Environmental Division  
Environmental Analysis and Compliance Branch

Mr. Jerry Brabander  
Field Supervisor  
U.S. Fish and Wildlife Service  
222 South Houston, Suite A  
Tulsa, OK 74127

Dear Mr. Brabander:

This letter is to request initial and informal coordination regarding assessment of the habitat suitability of property located at Skiatook Lake, Osage County, Oklahoma, for use by the American Burying Beetle (*Nicrophorus americanus*), a Federally listed endangered species.

In 2003, the U.S. Army Corps of Engineers, Tulsa District, (Corps) received and approved a request from the Skiatook Economic Development Authority (SEDA) for a lease of approximately 643 acres of land and 46 acres of water in portions of Sections 25, 26, 27, and 35, T22N R11E and Sections 2, 3, and 4, T21N R11E on lands administered by the Corps at Skiatook Lake in Osage County, Oklahoma (enclosed Figure 1). In accordance with their proposed plans for the lease property, SEDA subleased the property to StateSource, LCC, for the private development of public recreation facilities. Development that may occur within the lease area includes construction of a golf course, cabins, conference center, RV and other camping areas, a marina, roads for facility access, and an interpretative hiking trail (enclosed Figure 2).

Since the approval of the sublease and proposed CrossTimbers development plan in 2003, StateSource has recently decided to move the location of the proposed golf course and new camping area. Originally envisioned for construction at Skiatook Point, the CrossTimbers golf course is now proposed to be constructed in the Tall Chief Cove portion of the lease area (enclosed Figure 3). Construction of the golf course in this area will allow golfers easier access to the proposed conference center and marina facilities and will consolidate most of the infrastructure needs associated with the CrossTimbers development

to the south side of the lake. In conjunction with the proposed move of the golf course to the Tall Chief Cove area, the camping development originally proposed for Tall Chief Cove is now being proposed for the Skiatook Point area (enclosed Figure 4). Final designs for the camping area are under development, but may include primitive tent camping, RV camping, rustic cabins, day use docks, and associated roads, restrooms, water, electric, and sewer lines. The Corps will be addressing impacts of these proposed changes with an updated analysis in compliance with the National Environmental Policy Act.

Based on recommendations of your staff provided during our December 5, 2005 meeting, Corps personnel visited the SEDA lease area on December 14, 2005 to identify soils present in the lease area and gather information required for determination of habitat suitability. Investigations focused on the southern portion of the lease area near Tall Chief Cove and Tornado Cove. These areas were chosen due to the ongoing and upcoming construction activities associated with the conference center, cabins, marina parking expansion, and associated road networks. A total of six separate areas were investigated (enclosed Figure 5). In each area, four or more holes were hand excavated using shovels to a depth of between 6 and 12 inches and photographs were taken showing a representative soil profile and the vegetation present in the immediate area (enclosed Figures 6-17). At your request, we are forwarding this information to you so that you may assist us in determining soil suitability for American Burying Beetle use. We would appreciate receipt of your response on the matter so that we may take the appropriate steps to meet requirements under Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq).

Thank you for your help with this request. If you have any questions, please contact Ms. Sandra Stiles, Biologist, at 918-669-7662.

Sincerely,

  
Miroslav P. Kurka  
Colonel, U.S. Army  
District Engineer

Enclosures



In Reply Refer To:  
FWS/R2/OKES/  
2006-1-0031

## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Division of Ecological Services  
222 South Houston, Suite A  
Tulsa, Oklahoma 74127  
918/581-7458 / (FAX) 918/581-7467



January 4, 2006

Colonel Miroslav P. Kurka  
Corps of Engineers  
1645 South 101<sup>st</sup> East Avenue  
Tulsa, Oklahoma 74128-4609

Dear Colonel Kurka:

Thank you for your December 16, 2005, letter to the U.S. Fish and Wildlife Service (Service) requesting coordination regarding assessment of the habitat suitability for the American burying beetle *Nicrophorus americanus* (ABB) at the CrossTimbers development site at Skiatook Lake in Osage County, Oklahoma. The development was proposed by Skiatook Economic Development Authority (SEDA) and StateSource, LLC. (StateSource) and involves the U.S. Army Corps of Engineers (Corps) leasing 643 acres at Skiatook Lake to SEDA and Statesource for development of various projects including a golf course, RV parking, camping areas, cabins, a conference center, marinas, roads, restrooms, utilities, and parking lots. Our comments are submitted in accordance with section 7 of the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), National Environmental Policy Act (NEPA), and the Fish and Wildlife Coordination Act (FWCA).

The Corps completed the current Environmental Assessment (EA) for this project in 2003. The Service provided comments addressing the draft EA in our August 21, 2002, letter to the Corps. At that time the ABB was not known to occur within Osage County. However, in 2004 The Nature Conservancy provided documentation that the ABB had been collected from the Tall Grass Prairie Preserve in 1999.

On November 16, 2005, the Corps, via written correspondence, provided notification that the proposed project plans had been altered and requested an updated list of federally-listed species which may occur within the project area of influence. The Service notified the Corps, via telephone correspondence, that the ABB is now a species known to occur within Osage County and the Corps should evaluate potential effects to the ABB from the proposed project. The change in project plans and addition of the ABB to the county species list necessitates that the Corps reinstate section 7 consultation with the Service (the Corps' November 16, 2005, letter serves to reinstate consultation).

The proposed project plans also would require changes in land use relative to the plans adopted when the FWCA Report and General Plan were written for the Skiatook Lake Project. These changes also require coordination with the Service and the ODWC (per the FWCA) to develop

Colonel Kurka

2

appropriate mitigation measures, as appropriate. The Corps has informed the Service that they intend to complete a new EA for the proposed changes, as required by NEPA, and any modifications to the proposed action that result from the comments on the draft EA will need to be considered in the section 7 consultation. Changes from the existing project plans should not be implemented until section 7, FWCA and NEPA requirements have been completed. Please keep in mind that mitigation features developed pursuant to the FWCA and NEPA should be incorporated into the proposed action, as described in the revised draft EA, prior to your determination of effect concerning federally-listed species (i.e., fulfillment of section 7 responsibilities).

The endangered ABB historically occurred and currently persists in Osage County, and potentially could occur in and/or around the project area. Suitable vegetation and soil for the ABB are present within Osage County and the surrounding counties. Washington, Tulsa, Rogers, and Creek counties in Oklahoma, and Chautauquau County in Kansas are within the historic range of the ABB and adjacent or in close proximity to Osage County. The state of Kansas has designated Chautauquau and Montgomery counties as critical habitat for the ABB (Kansas Department of Wildlife and Parks 2000). Current ABB records of occurrence include Osage, Tulsa, Rogers and Montgomery counties.

The ABB has been captured via baited pitfall traps in a variety of habitats, including grasslands, grazed pasture, bottomland forest, riparian zones, and oak-hickory forest (Creighton *et al.* 1993; Lomolino and Creighton 1996; Lomolino *et al.* 1995; NatureServe Explorer 2003; and U.S. Fish and Wildlife Service 1991). The ABB once occurred throughout the eastern United States, but today is restricted to less than approximately 10 percent of its former range. The historic and current ranges of the ABB, and other related ABB life history information can be obtained from our ABB web site: <<http://ifw2cs.fws.gov/oklahoma/beetle1.htm>>.

On December 5, 2005, the Service met with the Corps to discuss the proposed project. The Corps provided an overview of the proposed project changes and requested assistance with evaluating potential impacts to the ABB. The Service recommended that the Corps conduct a habitat assessment to determine if suitable vegetation and soils were present within the proposed project area. The Corps' December 16, 2005, letter provided this information. The Service has reviewed the information supplied in the letter, as well as the topographic maps, soil maps, soil and vegetation photographs, and soil descriptions provided with the letter. We have also reviewed the current and historical ABB data in and around Osage County.

In addition, Service and Corps personnel visited the site on December 22, 2005, to evaluate the overall site conditions and habitat suitability for the ABB. Several additional soil samples were taken. A minimum of 49 soil samples were evaluated during this site visit and the Corps' previous habitat assessment. The majority of the project area contains potentially suitable soil and vegetation to support the ABB. However, soil does not appear to be suitable for the ABB along the lake shoreline and landward about 50 feet due to the high clay content and compactness of the soil. There also are isolated patches across the project area where the soil does not appear to be suitable for the ABB due to high clay content or soil structure. However, these isolated patches are small (diameters of a few or several feet) and appear to be exceptions to the typical soils identified by the Osage County Soil Survey. More detailed information concerning potential habitat suitability has been provided to Corps personnel.

Colonel Kurka

3

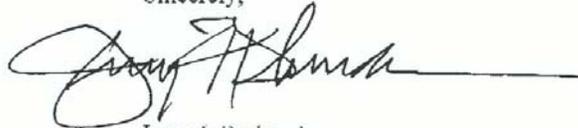
Section 7(a)(2) of the ESA requires that any action authorized, funded or carried out by a federal agency be reviewed for the potential to jeopardize the continued existence of any federally-listed species, or destroy or adversely modify designated critical habitat. It is incumbent upon the federal action agency to make this determination. In the event that a federal action agency determines that its action may affect a federally-listed species, the agency is required to consult with the Service regarding the degree of impact and measures available to avoid or minimize the adverse effects. The Service is then responsible for concurring or not concurring with the federal action agency's determination. If the Corps determines this proposed project may affect federally-listed species, formal consultation should be requested.

The revised draft EA, in addition to the effect determination, should describe the project in detail, including implementation methods, a timeline, a discussion of adverse and beneficial effects, and a mitigation plan detailing avoidance, minimization, and/or compensation measures to be implemented to offset any adverse impacts. Currently, the Corps has not made a determination as to any effects to federally-listed species, nor has an assessment or mitigation plan been provided to the Service. Again, please bear in mind that mitigation for project-related impacts identified during FWCA and NEPA-related analyses should be incorporated into project plans prior to determining whether the proposed action may affect federally-listed species.

During our December 5, 2005, meeting, the Corps informed the Service that some construction disturbance had already occurred and is ongoing. During our December 22, 2005, site visit, the Service was able to evaluate the extent of the construction disturbance and take soil samples. Disturbance has occurred in the areas designated as The Village and marina. Potentially suitable soil for the ABB is present in The Village site that has been disturbed. Please review information provided under separate cover concerning irreversible and irremediable commitment of resources prior to completion of coordination requirements. The Service cannot further address the extent of potential impacts to federally-listed species and other fish and wildlife resources without additional information regarding the acreage disturbed and method and timing of disturbance.

The Service requests a meeting with the Corps, SEDA, and StateSource to discuss project specifications, potential impacts to federally-listed species and other important fish and wildlife resources, and conservation and mitigation measures available to avoid or minimize potential adverse impacts. Please contact Hayley Dikeman at 918-382-4519 to schedule a meeting or address any questions. We appreciate the opportunity to review the proposed project and provide comments. Please include the project number at the top, left of the front page in any future reference to this proposed action.

Sincerely,



Jerry J. Brabander  
Field Supervisor

cc: Director, ODWC, Oklahoma City, OK  
Attn: Natural Resources Section

HMD\plh:21440-2006-1-0031 Skiatook Lake 12-19-05\_jjb.lhd 1-4-2006

## References

- Creighton, J.C., M.V. Lomolino, and G.D. Schnell. 1993. Survey methods for the American burying beetle (*Nicrophorus americanus*) In Oklahoma and Arkansas. Oklahoma Biological Survey, Norman, Oklahoma.
- Kansas Department of Wildlife and Parks. 2005. American Burying Beetle (*Nicrophorus Americanus*). [http://www.kdwp.state.ks.us/news/other\\_services/threatened\\_and\\_endangered\\_species/threatened\\_and\\_endangered\\_species/species\\_information/american\\_burying\\_beetle](http://www.kdwp.state.ks.us/news/other_services/threatened_and_endangered_species/threatened_and_endangered_species/species_information/american_burying_beetle)
- U.S. Fish and Wildlife Service. 1991. American Burying Beetle (*Nicrophorus americanus*) Recovery Plan. Newton Corner, Massachusetts. 80 pp.

# **APPENDIX C**

## **CULTURAL RESOURCES COORDINATION INFORMATION**



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101ST EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

January 12, 2005

Planning, Environmental, and Regulatory Division  
Environmental Analysis and Compliance Branch

Cherokee Nation of Oklahoma  
P.O. Box 948  
Tahlequah, OK 74465

Dear Sirs:

In accordance with 36 CFR 800, Protection of Historic Properties, the purpose of this letter is to initiate consultation regarding a proposed change in the CrossTimbers development plan at Skiatook Lake in Osage County, Oklahoma.

In 2003 the U.S. Army Corps of Engineers, Tulsa District, (COE) received and approved a request from the Skiatook Economic Development Authority (SEDA) for a lease of approximately 643 acres of land and 46 acres of water in portions of Sections 25, 26, 27, and 35, T22N R11E and Sections 2, 3, and 4, T21N R11E on lands administered by the COE at Skiatook Lake in Osage County, Oklahoma (Figures 1 and 2). In accordance with their proposed plans for the lease property, SEDA sub-leased the property to StateSource, LCC for the private development of public recreation facilities. Development that may occur within the lease area includes construction of a golf course, cabins, conference center, RV and other camping areas, a marina, and an interpretative hiking trail (Figures 3 and 4).

Since the approval of the sub-lease and proposed CrossTimbers development plan in 2003, StateSource has recently decided to move the location of the proposed golf course and new camping area. Originally envisioned for construction at Skiatook Point, the CrossTimbers golf course is now proposed to be constructed in the Tall Chief Cove portion of the lease area (Figure 5). Construction of the golf course in this area will allow golfers easier access to the proposed conference center and marina facilities, and will consolidate most of the infrastructure needs associated with the CrossTimbers development to the south side of the lake. In conjunction with the proposed move of the golf course to the Tall Chief Cove area, the camping development originally proposed for Tall Chief

Cove is now being proposed for the Skiatook Point area (Figure 6). Final designs for the camping area are under development, but may include primitive tent camping, RV camping, rustic cabins, day use docks, and associated roads, restrooms, water, electric, and sewer lines.

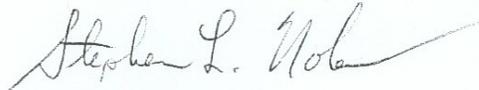
As a result of previous cultural resource surveys and consultations with the Quapaw, Osage, and other interested Native American tribes in 2002 and 2003, the COE identified two significant cultural resources in the vicinity of the CrossTimbers development (Figure 7). Site 34OS678 is a small burned rock mound approximately 10 meters in diameter and 0.5 meters in height located in the mowed front yard of the COE Skiatook Lake office. Because of the undisturbed nature and likelihood that the mound contains important prehistoric archeological information, we have determined that site 34OS678 is eligible for listing on the National Register of Historic Places (NRHP). This site, along with the Skiatook Lake office compound, has been excluded from the SEDA lease and will not be impacted by any proposed construction associated with the CrossTimbers development.

The other NRHP eligible cultural resource identified in the vicinity of the CrossTimbers development is Healing Rock (34OS679). Healing Rock is a large upright rock located on a ridge point near Skiatook Point. Originally located in Hominy Creek valley, the rock was moved to its present location by the COE at the request of the Quapaw and Osage tribes in 1986 in order to prevent the rock from being inundated by Skiatook Lake. Healing Rock is a traditional cultural property of significance to the Quapaw and Osage tribes due to association with some of the first Native American Church activities held in Osage County. Consultation in 2002 and 2003 between the COE, SEDA, and the Quapaw and Osage tribes lead to the current SEDA lease boundary which excludes both Healing Rock and the access trail.

In order to assist us in the assessment of the potential impacts of the proposed development change on cultural resources, we are requesting information that the Cherokee Nation is willing to share on any concerns that you may have regarding the potential impacts to cultural resources from the proposed change in the CrossTimbers development plan at Skiatook Lake.

Thank you for your help with this request. If you have any questions, please contact Mr. Louis Vogeles, Archeologist, at 918-669-4934.

Sincerely,

A handwritten signature in cursive script that reads "Stephen L. Nolen". The signature is written in dark ink and is positioned above the typed name.

Stephen L. Nolen  
Chief, Environmental Analysis  
and Compliance Branch

Encls



DEPARTMENT OF ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101<sup>ST</sup> EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

January 12, 2005

Planning, Environmental, and Regulatory Division  
Environmental Analysis and Compliance Branch

Mr. John Berrey, Chairman  
Quapaw Tribe of Oklahoma  
P.O. Box 765  
Quapaw, OK 74363

Dear Chairman Berry:

In accordance with 36 CFR 800, Protection of Historic Properties, the purpose of this letter is to initiate consultation regarding a proposed change in the CrossTimbers development plan at Skiatook Lake in Osage County, Oklahoma.

In 2003 the U.S. Army Corps of Engineers, Tulsa District, (COE) received and approved a request from the Skiatook Economic Development Authority (SEDA) for a lease of approximately 643 acres of land and 46 acres of water in portions of Sections 25, 26, 27, and 35, T22N R11E and Sections 2, 3, and 4, T21N R11E on lands administered by the COE at Skiatook Lake in Osage County, Oklahoma (Figures 1 and 2). In accordance with their proposed plans for the lease property, SEDA sub-leased the property to StateSource, LCC for the private development of public recreation facilities. Development that may occur within the lease area includes construction of a golf course, cabins, conference center, RV and other camping areas, a marina, and an interpretative hiking trail (Figures 3 and 4).

Since the approval of the sub-lease and proposed CrossTimbers development plan in 2003, StateSource has recently decided to move the location of the proposed golf course and new camping area. Originally envisioned for construction at Skiatook Point, the CrossTimbers golf course is now proposed to be constructed in the Tall Chief Cove portion of the lease area (Figure 5). Construction of the golf course in this area will allow golfers easier access to the proposed conference center and marina facilities, and will consolidate most of the infrastructure needs associated with the CrossTimbers development to the south side of the lake. In conjunction with the proposed move of the golf course to the Tall Chief Cove area, the camping development originally proposed for Tall Chief

Cove is now being proposed for the Skiatook Point area (Figure 6). Final designs for the camping area are under development, but may include primitive tent camping, RV camping, rustic cabins, day use docks, and associated roads, restrooms, water, electric, and sewer lines.

As a result of previous cultural resource surveys and consultations with the Quapaw, Osage, and other interested Native American tribes in 2002 and 2003, the COE identified two significant cultural resources in the vicinity of the CrossTimbers development (Figure 7). Site 34OS678 is a small burned rock mound approximately 10 meters in diameter and 0.5 meters in height located in the mowed front yard of the COE Skiatook Lake office. Because of the undisturbed nature and likelihood that the mound contains important prehistoric archeological information, we have determined that site 34OS678 is eligible for listing on the National Register of Historic Places (NRHP). This site, along with the Skiatook Lake office compound, has been excluded from the SEDA lease and will not be impacted by any proposed construction associated with the CrossTimbers development.

The other NRHP eligible cultural resource identified in the vicinity of the CrossTimbers development is Healing Rock (34OS679). Healing Rock is a large upright rock located on a ridge point near Skiatook Point. Originally located in Hominy Creek valley, the rock was moved to its present location by the COE at the request of the Quapaw and Osage tribes in 1986 in order to prevent the rock from being inundated by Skiatook Lake. Healing Rock is a traditional cultural property of significance to the Quapaw and Osage tribes due to association with some of the first Native American Church activities held in Osage County. Consultation in 2002 and 2003 between the COE, SEDA, and the Quapaw and Osage tribes lead to the current SEDA lease boundary which excludes both Healing Rock and the access trail.

In order to assist us in the assessment of the potential impacts of the proposed development change on cultural resources, we are requesting information that the Quapaw Tribe is willing to share on any concerns that you may have regarding the potential impacts to cultural resources from the proposed change in the CrossTimbers development plan at Skiatook Lake.

Thank you for your help with this request. If you have any questions, please contact Mr. Louis Vogeles, Archeologist, at 918-669-4934.

Sincerely,



Stephen L. Nolen  
Chief, Environmental Analysis  
and Compliance Branch

Encls

Copy furnished:  
Mr. Steve Ward  
Conner and Winters  
3700 1<sup>st</sup> Place Tower  
15 East 5<sup>th</sup> Street  
Tulsa, OK 74103



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101ST EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

January 12, 2005

Planning, Environmental, and Regulatory Division  
Environmental Analysis and Compliance Branch

Kaw Tribe of Oklahoma  
P.O. Drawer 50  
Kaw City, OK 74641

Dear Sirs:

In accordance with 36 CFR 800, Protection of Historic Properties, the purpose of this letter is to initiate consultation regarding a proposed change in the CrossTimbers development plan at Skiatook Lake in Osage County, Oklahoma.

In 2003 the U.S. Army Corps of Engineers, Tulsa District, (COE) received and approved a request from the Skiatook Economic Development Authority (SEDA) for a lease of approximately 643 acres of land and 46 acres of water in portions of Sections 25, 26, 27, and 35, T22N R11E and Sections 2, 3, and 4, T21N R11E on lands administered by the COE at Skiatook Lake in Osage County, Oklahoma (Figures 1 and 2). In accordance with their proposed plans for the lease property, SEDA sub-leased the property to StateSource, LCC for the private development of public recreation facilities. Development that may occur within the lease area includes construction of a golf course, cabins, conference center, RV and other camping areas, a marina, and an interpretative hiking trail (Figures 3 and 4).

Since the approval of the sub-lease and proposed CrossTimbers development plan in 2003, StateSource has recently decided to move the location of the proposed golf course and new camping area. Originally envisioned for construction at Skiatook Point, the CrossTimbers golf course is now proposed to be constructed in the Tall Chief Cove portion of the lease area (Figure 5). Construction of the golf course in this area will allow golfers easier access to the proposed conference center and marina facilities, and will consolidate most of the infrastructure needs associated with the CrossTimbers development to the south side of the lake. In conjunction with the proposed move of the golf course to the Tall Chief Cove area, the camping development originally proposed for Tall Chief

Cove is now being proposed for the Skiatook Point area (Figure 6). Final designs for the camping area are under development, but may include primitive tent camping, RV camping, rustic cabins, day use docks, and associated roads, restrooms, water, electric, and sewer lines.

As a result of previous cultural resource surveys and consultations with the Quapaw, Osage, and other interested Native American tribes in 2002 and 2003, the COE identified two significant cultural resources in the vicinity of the CrossTimbers development (Figure 7). Site 34OS678 is a small burned rock mound approximately 10 meters in diameter and 0.5 meters in height located in the mowed front yard of the COE Skiatook Lake office. Because of the undisturbed nature and likelihood that the mound contains important prehistoric archeological information, we have determined that site 34OS678 is eligible for listing on the National Register of Historic Places (NRHP). This site, along with the Skiatook Lake office compound, has been excluded from the SEDA lease and will not be impacted by any proposed construction associated with the CrossTimbers development.

The other NRHP eligible cultural resource identified in the vicinity of the CrossTimbers development is Healing Rock (34OS679). Healing Rock is a large upright rock located on a ridge point near Skiatook Point. Originally located in Hominy Creek valley, the rock was moved to its present location by the COE at the request of the Quapaw and Osage tribes in 1986 in order to prevent the rock from being inundated by Skiatook Lake. Healing Rock is a traditional cultural property of significance to the Quapaw and Osage tribes due to association with some of the first Native American Church activities held in Osage County. Consultation in 2002 and 2003 between the COE, SEDA, and the Quapaw and Osage tribes lead to the current SEDA lease boundary which excludes both Healing Rock and the access trail.

In order to assist us in the assessment of the potential impacts of the proposed development change on cultural resources, we are requesting information that the Kaw Tribe is willing to share on any concerns that you may have regarding the potential impacts to cultural resources from the proposed change in the CrossTimbers development plan at Skiatook Lake.

Thank you for your help with this request. If you have any questions, please contact Mr. Louis Vogeles, Archeologist, at 918-669-4934.

Sincerely,

A handwritten signature in cursive script that reads "Stephen L. Nolen".

Stephen L. Nolen  
Chief, Environmental Analysis  
and Compliance Branch

Encls



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101ST EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

January 12, 2005

Planning, Environmental, and Regulatory Division  
Environmental Analysis and Compliance Branch

Mr. Gary McAdams, President  
Wichita and Affiliated Tribes of Oklahoma  
P.O. Box 729  
Anadarko, OK 73005

Dear President McAdams:

In accordance with 36 CFR 800, Protection of Historic Properties, the purpose of this letter is to initiate consultation regarding a proposed change in the CrossTimbers development plan at Skiatook Lake in Osage County, Oklahoma.

In 2003 the U.S. Army Corps of Engineers, Tulsa District, (COE) received and approved a request from the Skiatook Economic Development Authority (SEDA) for a lease of approximately 643 acres of land and 46 acres of water in portions of Sections 25, 26, 27, and 35, T22N R11E and Sections 2, 3, and 4, T21N R11E on lands administered by the COE at Skiatook Lake in Osage County, Oklahoma (Figures 1 and 2). In accordance with their proposed plans for the lease property, SEDA sub-leased the property to StateSource, LCC for the private development of public recreation facilities. Development that may occur within the lease area includes construction of a golf course, cabins, conference center, RV and other camping areas, a marina, and an interpretative hiking trail (Figures 3 and 4).

Since the approval of the sub-lease and proposed CrossTimbers development plan in 2003, StateSource has recently decided to move the location of the proposed golf course and new camping area. Originally envisioned for construction at Skiatook Point, the CrossTimbers golf course is now proposed to be constructed in the Tall Chief Cove portion of the lease area (Figure 5). Construction of the golf course in this area will allow golfers easier access to the proposed conference center and marina facilities, and will consolidate most of the infrastructure needs associated with the CrossTimbers development to the south side of the lake. In conjunction with the proposed move of the golf course to the Tall Chief Cove area, the camping development originally proposed for Tall Chief

Cove is now being proposed for the Skiatook Point area (Figure 6). Final designs for the camping area are under development, but may include primitive tent camping, RV camping, rustic cabins, day use docks, and associated roads, restrooms, water, electric, and sewer lines.

As a result of previous cultural resource surveys and consultations with the Quapaw, Osage, and other interested Native American tribes in 2002 and 2003, the COE identified two significant cultural resources in the vicinity of the CrossTimbers development (Figure 7). Site 34OS678 is a small burned rock mound approximately 10 meters in diameter and 0.5 meters in height located in the mowed front yard of the COE Skiatook Lake office. Because of the undisturbed nature and likelihood that the mound contains important prehistoric archeological information, we have determined that site 34OS678 is eligible for listing on the National Register of Historic Places (NRHP). This site, along with the Skiatook Lake office compound, has been excluded from the SEDA lease and will not be impacted by any proposed construction associated with the CrossTimbers development.

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In order to assist us in the assessment of the potential impacts of the proposed development change on cultural resources, we are requesting information that the Wichita and Affiliated Tribes are willing to share on any concerns that you may have regarding the potential impacts to cultural resources from the proposed change in the CrossTimbers development plan at Skiatook Lake.

Thank you for your help with this request. If you have any questions, please contact Mr. Louis Vogeles, Archeologist, at 918-669-4934.

Sincerely,

A handwritten signature in cursive script that reads "Stephen L. Nolen".

Stephen L. Nolen  
Chief, Environmental Analysis  
and Compliance Branch

Encls



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101ST EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

January 12, 2005

Planning, Environmental, and Regulatory Division  
Environmental Analysis and Compliance Branch

Mr. Jim Roan Gray, Chief  
Osage Nation of Oklahoma  
627 Grandview Avenue  
Pawhuska, OK 74056

Dear Chief Gray:

In accordance with 36 CFR 800, Protection of Historic Properties, the purpose of this letter is to initiate consultation regarding a proposed change in the CrossTimbers development plan at Skiatook Lake in Osage County, Oklahoma.

In 2003 the U.S. Army Corps of Engineers, Tulsa District, (COE) received and approved a request from the Skiatook Economic Development Authority (SEDA) for a lease of approximately 643 acres of land and 46 acres of water in portions of Sections 25, 26, 27, and 35, T22N R11E and Sections 2, 3, and 4, T21N R11E on lands administered by the COE at Skiatook Lake in Osage County, Oklahoma (Figures 1 and 2). In accordance with their proposed plans for the lease property, SEDA sub-leased the property to StateSource, LCC for the private development of public recreation facilities. Development that may occur within the lease area includes construction of a golf course, cabins, conference center, RV and other camping areas, a marina, and an interpretative hiking trail (Figures 3 and 4).

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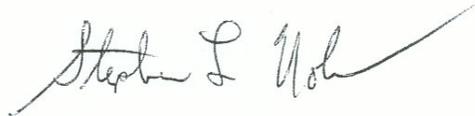
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In order to assist us in the assessment of the potential impacts of the proposed development change on cultural resources, we are requesting information that the Osage Nation is willing to share on any concerns that you may have regarding the potential impacts to cultural resources from the proposed change in the CrossTimbers development plan at Skiatook Lake.

Thank you for your help with this request. If you have any questions, please contact Mr. Louis Vogeles, Archeologist, at 918-669-4934.

Sincerely,

A handwritten signature in cursive script that reads "Stephen L. Nolen". The signature is written in dark ink and is positioned above the typed name.

Stephen L. Nolen  
Chief, Environmental Analysis  
and Compliance Branch

Encls

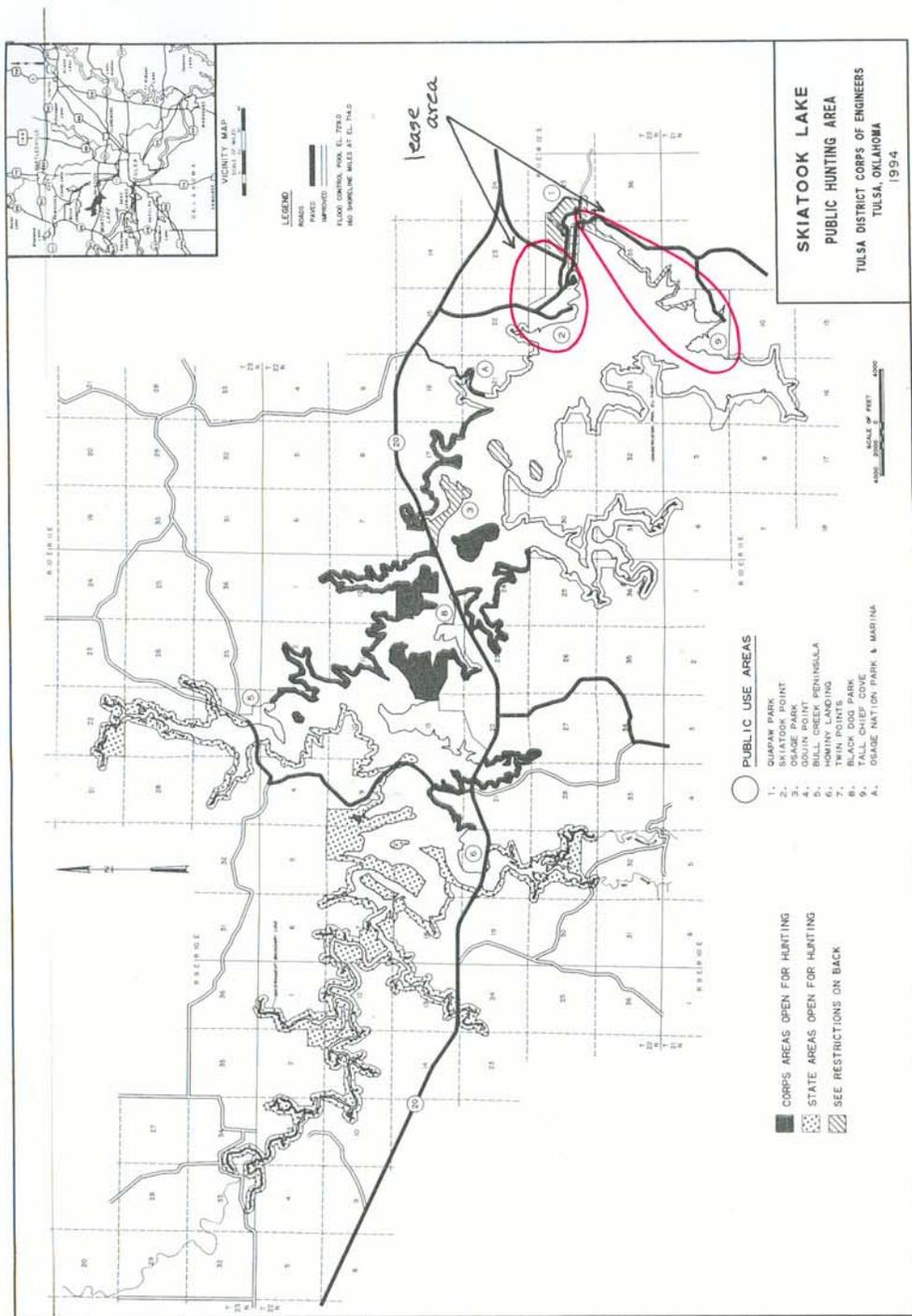


FIGURE 1  
 General location of  
 SEDA lease at  
 Skiatook Lake

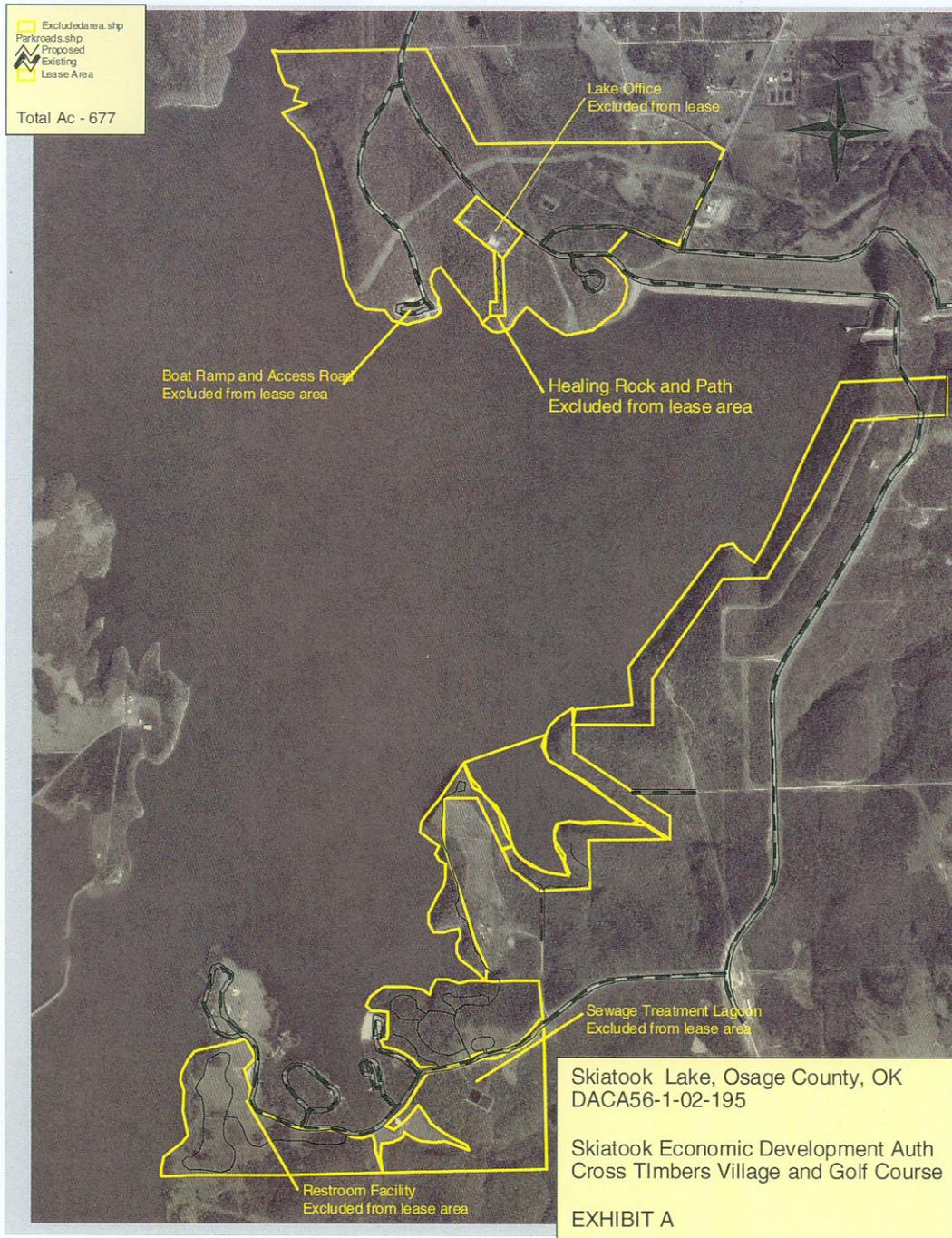


FIGURE 2

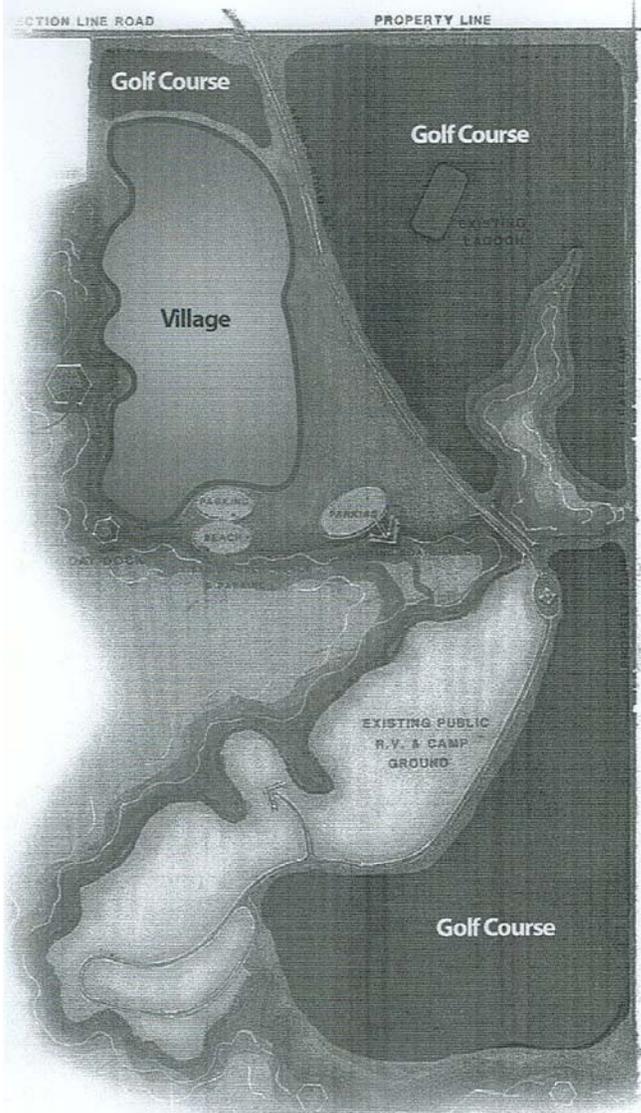
SEDA lease at Skiatook Lake



FIGURE 4  
Original location of  
golf course



  
**CrossTimbers**  
**Land Plan**



Uses may be relocated within the lease area with the approval of the USACE

FIGURE 5  
Proposed new location  
of golf course

  
**Land Plan**

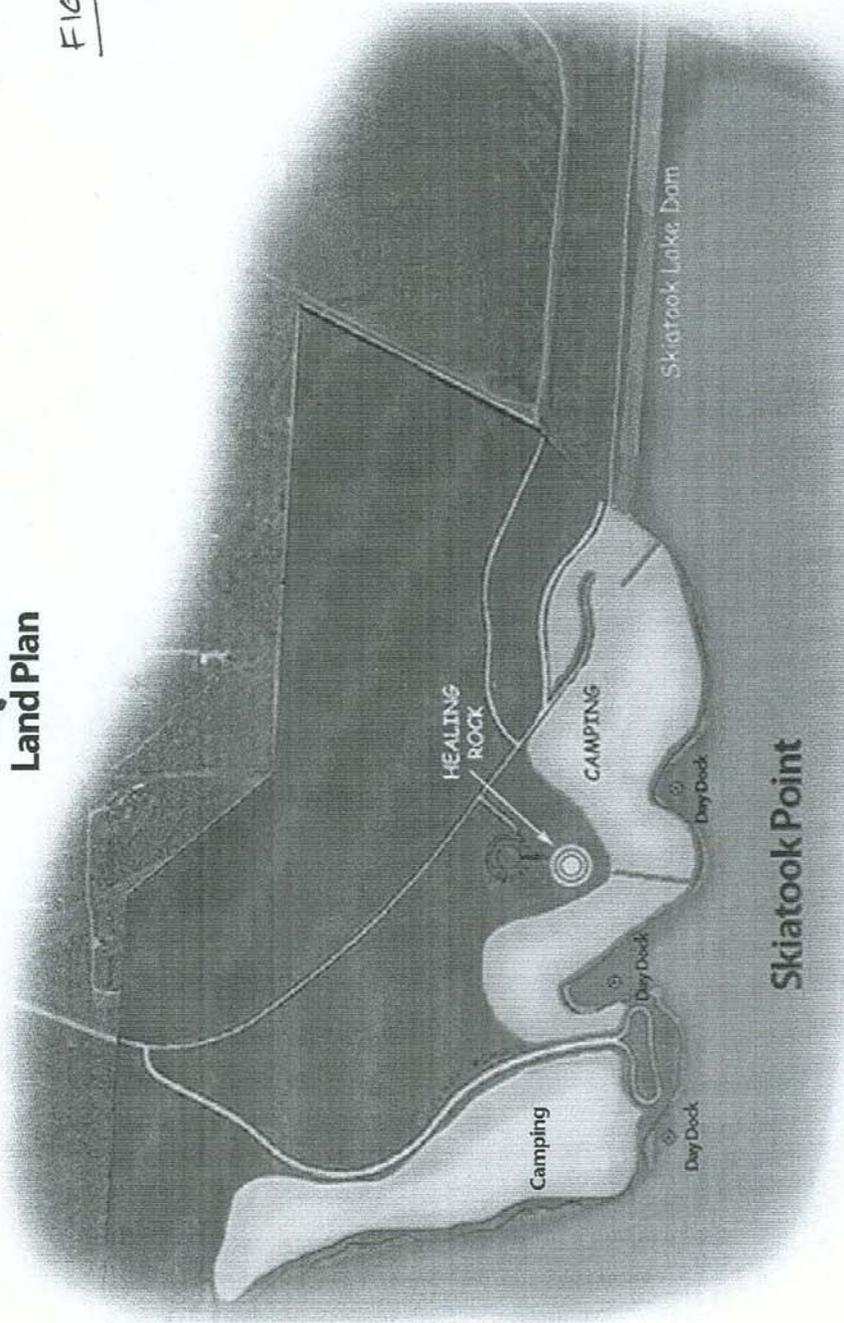


FIGURE 6  
Proposed new location  
of camping area

Uses may be relocated within the lease area with the approval of the USACE



FIGURE 7  
Significant cultural resources and area excluded  
from SEDA lease

**JIM GRAY**  
Principal Chief  
**KENNETH H. BIGHORSE**  
Assistant Principal Chief



**MEMBERS OF COUNCIL**  
MARK FREEMAN Jr.  
TERRY MASON MOORE  
HARRY ROY RED EAGLE  
JODIE SATEPAUHOODLE  
JERRY SHAW  
PAUL R. STABLER  
DUDLEY WHITEHORN  
JOHN W. WILLIAMS

**OSAGE TRIBAL COUNCIL**

**RECEIVED**

**JAN 20 2005**

**REGULATORY**

January 19, 2005

US Army Corps of Engineers  
Attn: Regulatory Branch  
Attn: Larry Hogue, P.E.  
1645 South 101<sup>st</sup> East Ave.  
Tulsa, OK 74128-4609

RE: Public Notice No. OKR2013755 (Addendum); Also see attached letter

To Whom It May Concern:

The Osage Tribe of Oklahoma has evaluated the above reference sites, and we have determined that the site could have religious or cultural significance to the Osage Tribe being our former reservation & homeland. However, if construction activities should expose Osage archeological materials, such as bone, pottery, chipped stone, etc., we ask that construction activities cease, and this office be contacted so that an evaluation can be made.

Should you have any questions, you can reach me at (918) 287-5446.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Anthony P. Whitehorn".

Anthony P. Whitehorn  
Tribal Enterprise Manager

Osage Tribal Council, P.O. Box 779, Pawhuska, OK 74056, (918) 287-5432, FAX (918) 287-2257



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101ST EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

January 12, 2005

Planning, Environmental, and Regulatory Division  
Environmental Analysis and Compliance Branch

RECEIVED

JAN 18 2005

OSAGE TRIBAL COUNCIL

Mr. Jim Roan Gray, Chief  
Osage Nation of Oklahoma  
627 Grandview Avenue  
Pawhuska, OK 74056

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# QUAPAW TRIBE OF OKLAHOMA

P.O. Box 765  
Quapaw, OK 74363-0765

(918) 542-1853  
FAX (918) 542-4694

January 27, 2005

John H. Roberts  
Tulsa District, Army Corps of Engineers  
1645 S. 101st East Avenue  
Tulsa, Oklahoma 74128

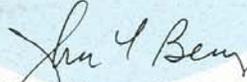
Re: Section 106 Issues Relating to the CrossTimbers Development Plan at Skiatook Lake

Dear John:

I am in receipt of the January 12, 2005, letter received from Stephen Nolen concerning the Corps of Engineers' development plan at Skiatook Lake. I am writing to you to convey the continuing interest and willingness of the Quapaw Tribe of Oklahoma (O-Gah-Pah) to participate in consultation with the Corps concerning this project. As we have mentioned in the past, our particular concern is for the Healing Rock which, as we understand it, will be subjected to more foot traffic as a result of a proposed campground in the area.

Please contact me at your convenience so we can discuss the Corps' plans to protect the Healing Rock from potential damage.

Sincerely,



John L. Berrey, Chairman  
Quapaw (O-Gah-Pah) Tribe of Oklahoma

JLB/wah

cc: Carrie V. Wilson, Cultural Resources Director, Quapaw Tribe



DEPARTMENT OF ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101<sup>ST</sup> EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

November 30, 2005

Planning and Environmental Division  
Environmental Analysis and Compliance Branch

Mr. John Berrey, Chairman  
Quapaw Tribe of Oklahoma  
P.O. Box 765  
Quapaw, OK 74363

Dear Chairman Berrey:

In accordance with 36 CFR 800 (Protection of Historic Properties), the purpose of this letter is to notify you of proposed changes in the CrossTimbers development plans within the Skiatook Economic Development Authority lease at Skiatook Lake in Osage County, Oklahoma.

As you are aware, the Skiatook Economic Development Authority (SEDA) was granted a lease on approximately 643 acres of land and 46 acres of water at Skiatook Lake in Osage County, Oklahoma (Figure 1). SEDA subsequently subleased this property to StateSource, LCC for the private development of public recreation facilities on the property, including a golf course, marina and boat service, trails, RV sites, cabins, and a village, and this development was coordinated with the Quapaw Tribe and approved through an Environmental Assessment (EA) signed by our District Commander in February 2003.

There has been a recent request from StateSource to modify the previously approved plans for a portion of the CrossTimbers development. Specifically, the requested change involves the relocation of the proposed golf course and the camping and RV areas. StateSource is proposing to move the golf course from Skiatook Point to the Tall Chief Cove area of the lake, and move the camping and RV areas from Tall Chief Cove to Skiatook Point (Figures 2 and 3). As part of this proposed development change we are requiring the preparation of a new EA in order to assess the environmental impacts of the proposal. We are interested in reopening consultation with the Quapaw Tribe regarding any concerns that you may have on the impacts of this change in proposed development to traditional cultural properties (e.g. Healing Rock) or other cultural resources, and would like to schedule a meeting on-site at Skiatook Lake to discuss this proposal as soon as possible.

Thank you for your continued interest in this project. We look forward to hearing from you soon. If you have any questions, please contact Mr. Louis Vogele, Archeologist, at 918-669-4934.

Sincerely,

*Gene Lilly*

Susan J. Haslett, P.E.

*FOR* Chief, Planning and Environmental  
Division

Enclosures



DEPARTMENT OF ARMY  
CORPS OF ENGINEERS, TULSA DISTRICT  
1645 SOUTH 101<sup>ST</sup> EAST AVENUE  
TULSA, OKLAHOMA 74128-4609

November 30, 2005

Planning and Environmental Division  
Environmental Analysis and Compliance Branch

Mr. Jim Roan Gray, Chief  
Osage Nation of Oklahoma  
627 Grandview Avenue  
Pawhuska, OK 74056

Dear Chief Gray:

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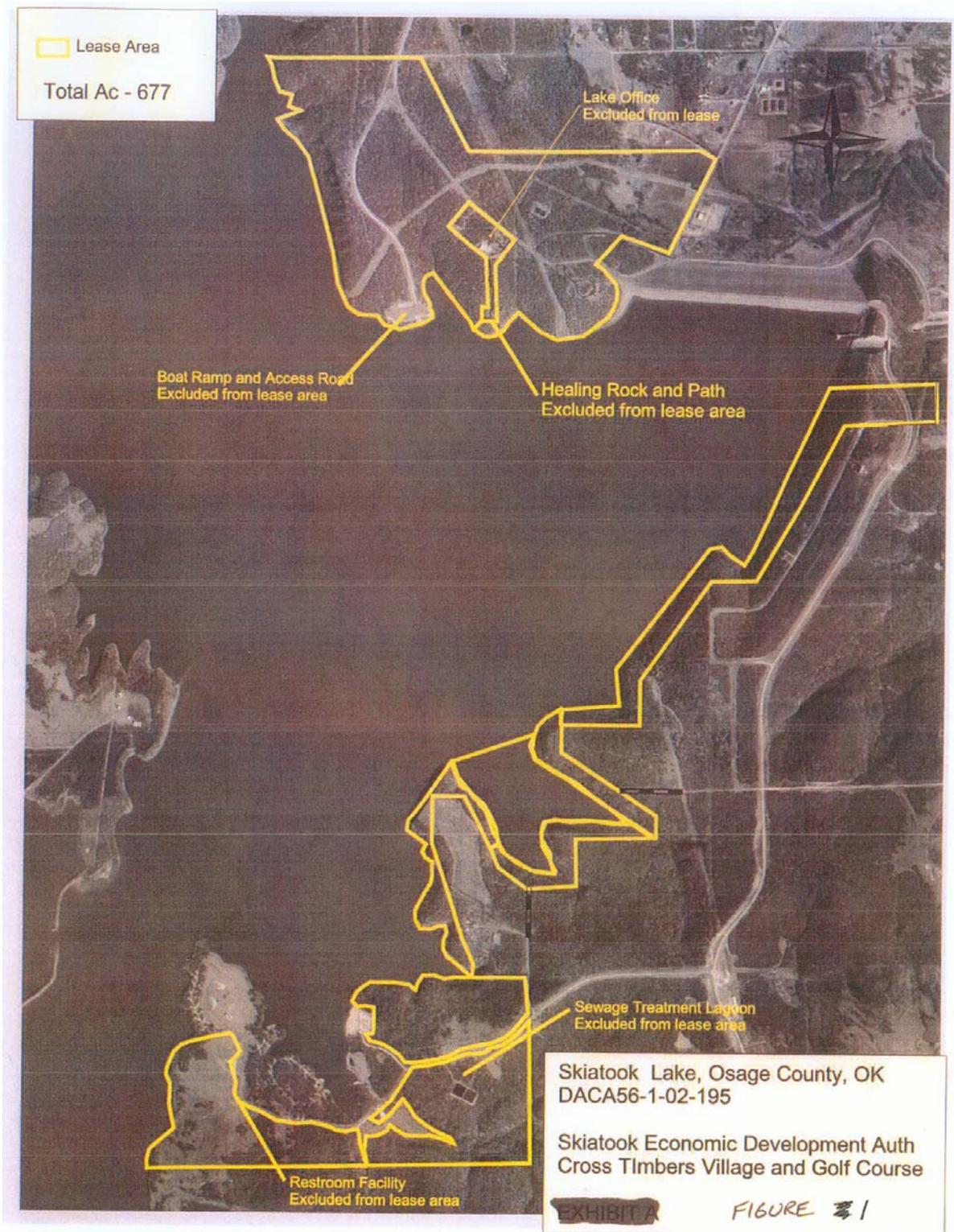
Sincerely,

*Gene Lilly*

Susan J. Haslett, P.E.

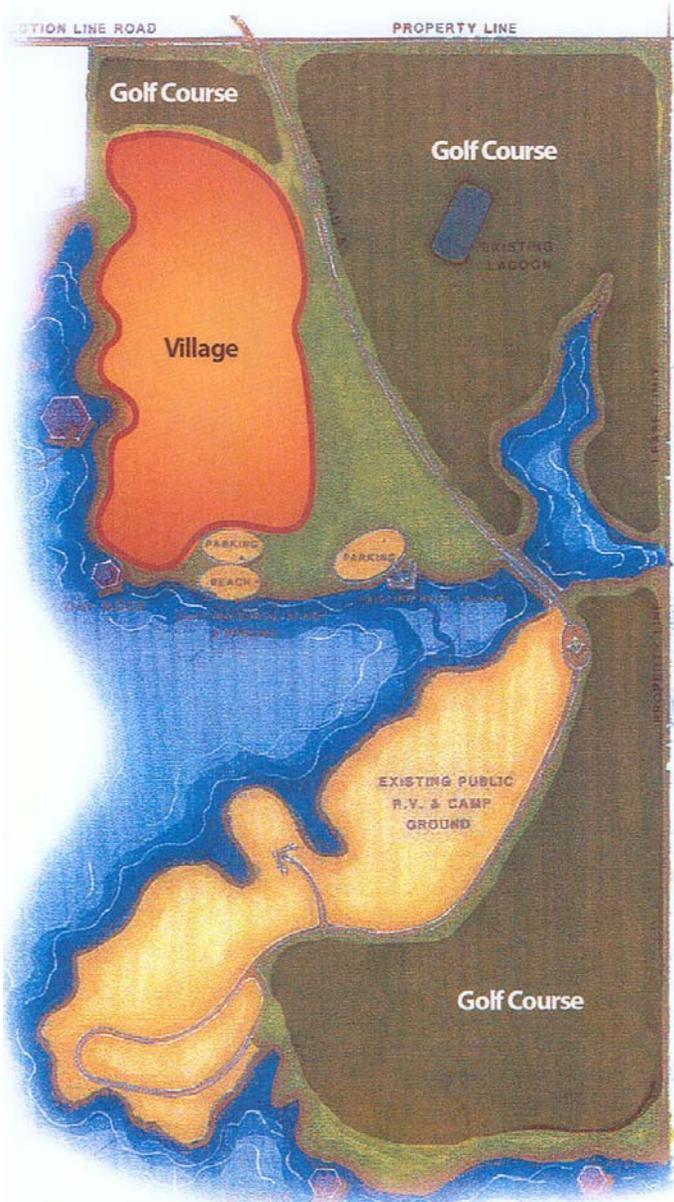
*For* Chief, Planning and Environmental  
Division

Enclosures



  
**CrossTimbers**  
**Land Plan**

FIGURE 2



Uses may be relocated within the lease area with the approval of the USACE



FIGURE 3

Uses may be relocated within the lease area with the approval of the USACE

# **APPENDIX D**

## **CROSTIMBERS ENVIRONMENTAL MANAGEMENT PLAN**



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Cultural Resources Plan . . . . . 21

Part III - Aquatic & Terrestrial Mitigation Plan . 25

**PART I**

**Old Growth Tree Inventory**

CrossTimbers Resort (Phase I)

Skiatook Lake, OK

Prepared by  
EMP Development Team

November 17, 2003

**Old Growth Tree Inventory  
CrossTimbers Resort (Phase I)  
Skiatook Lake, OK**

1. Purpose. To identify and map candidate old growth trees within the CrossTimbers Resort Recreation Lease, Skiatook Lake, OK.

2. Background.

A condition of the Environmental Assessment (EA) for CrossTimbers Resort requires old growth forest to be mapped and incorporated in the Environmental Management Plan (EMP).

The CrossTimbers lease area is primarily composed of upland woods interspersed with native tall-grass prairie. Post Oak and Blackjack Oak, and others tree and shrub species grow on rocky land. Understory vegetation consist of small annuals or succulent perennials with very short tap roots, or shallow spreading roots. Sandstone or limestone caps are prevalent on many of the hills in this region. Soils associated with these caps are mostly thin sandy soils. The terrain varies from flat to very steep slopes (40%) with rocky outcrops.

The project area contains a unique habitat type, the Cross Timbers. This vegetation type is dominated by Blackjack Oak, Post oak and Black Hickory (*Carya texana*), with an understory dominated by little bluestem. Subdominants include big bluestem, side-oats grama, hairy grama (*Bouteloua hirsuta*), purple lovegrass (*Eragrostis spectabilis*), sand lovegrass (*E. trichodes*), Scribner's panicum, Indian-grass, longleaf dropseed and Texas needlegrass (*Nasella leucotricha*) (*Stipaleucotricha*) as understory, and hackberry (*Celtis* spp.) as an overstory species.

One component of this habitat type is "old growth" or ancient Cross Timbers. Tree ring investigations indicate that the ancient cross timber community has remained relatively unchanged following the last glacial period some 6,000 years ago (Stahle et.al., 2000). Due to the rapidly declining trends in this habitat type the value and function of the old growth Cross Timbers is of special importance. It has been estimated that portions of the project area have a 77 % chance of containing old growth Cross Timbers (Therrell and Stahle 1998).

3. Survey Procedures

EMP Development Team Members:

Dr. John Lamberton	Environmental Management Consultant
Dustin Huff	State Source
Blu Hulsey	Town of Skiatook (SEDA)
Jeff London	Consultant, Registered Forester
Greg Bersche	Corps of Engineers
Jim Harris	Corps of Engineers

The lease area on the southeast side of the lake was mapped first. This area contains the camping area, village, and the marina (Project Development Phase I). Skiatook Point and the area south of Tall Chief Cove road will not be mapped until such time that the development of that part of the lease area is more imminent.

The mapping project started in the campground area near the John Zink Ranch and proceeded northeastward to the Spillway. The survey methods varied depending on forest density and size. In dense forested areas, parallel transect lines ranging from 100 to 150 feet wide were used to ensure sufficient coverage. In low density or narrow strips where visual contact could be maintained by team members, the distances were adjusted to maintain coverage.

The field surveys started on Thursday, September 25 and completed on October 30, 2003. The procedures for the mapping project were jointly planned and agreed upon by the CrossTimbers EMP Development Team and the USACE. Survey zones were established to identify the extent of daily survey progress and do not necessarily represent a specific forest type or site condition.

The USACE team members, Jim Harris and Greg Bersche, reviewed and monitored the Ancient Timber mapping process on a continuous basis during the exercise. Due to the continuous participation by the USACE team, a survey zone was considered adequately mapped at the end of each day by mutual agreement of the CrossTimbers EMP Development Team and the USACE team.

For the purpose of this survey Old Growth or Ancient Timber are defined as those Post Oak trees over 200 years old. The Ancient Cross Timbers Consortium describes the Ancient Cross Timbers forest type (Post Oak and Blackjack Oak) as a forest type that tends to dominate dry, rocky positions, and includes Post Oak trees 200- to 500-years old. It includes dense forest, open woodland, glades, and savannas. Although there is some variation in the literature defining the age range of "Ancient Timber", this survey used a conservative estimate of 200 years.

In this survey, candidate Ancient Trees are defined as those trees displaying physical characteristics common to Ancient Timber. Characteristics of candidate trees include but are not limited to diameter in relation to soil quality; nubs or scars from branch loss; and treetops that are gone or partially gone. Information including the nutrient conditions and the topography of the area immediately surrounding a tree (such as the presence and quantity of sandstone or limestone rocks) contributed to the determination that a tree is an Ancient Timber candidate. Selected candidate trees were cored to determine age and estimated growth rates for a specific site. Remaining candidate trees were not aged as part of this survey. If there is a conflict between known candidate trees

and the project's land use plan, additional cores will be used to determine if it qualifies as an "Ancient Tree".

No dead trees were mapped.

#### 4. Survey Collection

GPS Equipment. A hand held Global Positioning System (GPS) unit, eTrex Vista manufactured by Garmin, was used to obtain the approximate locations of individual candidate trees. The level of accuracy varied depending on the clear view of the sky with satellite reception. The Wide Area Augmentation System (WAAS) was enabled to receive data for correcting differentials in the GPS satellite signals. The manufacture cautions the user that it is not to be used for precise measurements.

##### Individual Tree Collection Data

\* Diameter Breast Height (DBH). Individual tree diameter was taken at 4.5 ft above ground and measured to the nearest inch.

\* Height. Individual tree height was estimated to the nearest 5 ft.

\* Growth Rate. Non-destructive core samples, 5mm diameter, were extracted from selected old trees to determine the total age of a tree and establish a growth rate for different sites.

\* Tree and Site Characteristics. Visual observation of the trees characteristics was used to identify candidate trees. Typical tree and site characteristics included but were not limited to diameter in relation to soil quality; presence of nubs or scars from branch loss; large trunk scars, and tree tops that were gone or partially gone.

Note: There was an abundance of broken tops that resulted from tornados in the late 1980's and severe drought in the 1950's.

\* Digital Photographs. Digital photographs were taken of selected trees that exhibited unique and common characteristics of Old Growth trees. Each photo was identified according to the individual tree identification number.

Mapping Software. ArcView GIS Programs (versions 8.1 and 3.2) software was used to plot various tree locations, identify lease boundaries, survey zones and land use plans. All map projections are based on UTM NAD 83 Zone 14N in feet.

#### 5. Survey Results

**General Results.** There were a total of 783 Post Oak trees surveyed in the area scheduled for initial development. This survey report

covers approximately 30% of the lease area. Based on average tree growth rates for specific areas, tree age was estimated by multiplying the growth rate by the tree radius ( $\text{Rate} * \text{DBH}/2$ ). Growth rates were selected based on core samples and site location. Core samples were taken from approximately 21 trees (3%). Intact core samples could not always be extracted due to heart rot and the outer rings were used as a basis for estimating growth. Core samples were identified and retained by the Corps of Engineers, Skiatook Lake Office.

**Candidate Tree Selection Criteria.** During the inventory process it became apparent that site conditions and rates of growth varied through out the survey area. Factors noted during the survey that seemed to influence growth rate included slope aspect (north-facing vs. south-facing), soil type and depth, underlying bedrock type and depth, proximity to exposed surface rock, slope of the terrain, density of surrounding vegetation, and the overall condition of the tree related to its ability to procure and process soil nutrients. As the survey progressed, diameter selection criteria were modified as a result of these factors. Example: a 14" DBH tree growing on steep, rocky, north facing slope was considered to be a candidate tree because it had a slower growth rate and estimated to be over 200 years old. Conversely, a similar size tree in better growing conditions would have a faster growth rate and therefore be approximately 140 years old.

Growth rates and diameter were not the only factors in identifying candidate trees. Trees that exhibited other physical characteristics typical of old growth timbers were also included as criteria as previously discussed.

**Survey Zone 1** - Area 1 is approximately 47 acres located south of Tall Chief Cove campground. The terrain is gradual sloping with open grassland and isolated stands of trees. Most of the trees are located along shoreline or drainage areas. Lower stands of timber have been subject to inundation as part of the projects flood control operations. A total of 32 trees were inventoried in this area ranging from 12 - 26 inches DBH and a mean of 17.1" DBH. One tree was aged in this area and the growth rate for this area is approximately 20 years per inch.

**Survey Zone 2 & 3** - These areas include approximately 62 acres located from the swimming beach and boat ramp to the southern boundary line. This area is scheduled to be developed for the Village area and will include a conference center, store and cabins. The terrain varies from gentle sloping to very steep along the shoreline with some open grassland. Most of the area is mix hardwood forest type. Density varied from light to heavy with several open stands and savannahs. A total of 64 trees were inventoried in this area ranging from 10" to 28" DBH and a mean of 17.6" DBH. Three (3) trees were aged in this area and the growth rate for this area varied from 16 to 25 years per inch depending on

the site location. The mean growth rates for this area are 16 and 20 years per inch. The 16 yr/inch growth rate is for trees located on flat to gentle sloping terrain and 20 yrs/inch growth rate for steep, rocky slopes. The 20 yrs/in growth rate is comparable to those rates found in adjacent zones with similar slopes and growing conditions.

**Survey Zone 4** - This area is a relative narrow strip of land between the proposed Village area and the Marina. Planned development for this area is cabin sites along the north shore and the marina development in the cove (Tornado Cove) to the north. It is approximately 39 acres with terrain that varies from relative flat to very steep along the shoreline. There are small points on the north shore that have gentle slopes while the remaining area is steep and rocky. The area in the marina cove is typically steep and rocky. Most of the tree cover in this area consists of Post Oak - Blackjack Oak forest type that varies from heavy to moderate density. A small portion is an old field with invading wood species. A total of 33 trees were inventoried in this area with diameters ranging from 15" to 26" DBH and a mean of 19.5" DBH. Five (5) trees were cored in this area and rates ranged from 15 - 25 years per inch. The mean growth rate for this area is 20 years per inch.

**Survey Zone 5** - This area is a narrow strip of land located on the north shore of the marina cove. This area is planned as part of the marina development. It is approximately 14 acres with steep and rocky terrain. Forest cover consists of dense Post Oak and Blackjack Oak with few openings. Total trees inventoried are 82 in this area with diameters ranging from 11" to 21" in DBH and a mean of 14.2" DBH. Four trees were cored and growth rates ranged from 20 to 26 years per inch. The mean growth rate for this area is 25 years per inch.

**Survey Zone 6 & 7** These areas consist of a narrow strip of land located between the marina cove and Skiatook Spillway. This area is planned for low density development such as nature trails. It is approximately 32 acres with steep and rocky terrain. Forest cover consists of dense Post Oak and Blackjack Oak with few openings. Total trees inventoried are 220 in this area with diameters ranging from 12" to 28" DBH and a mean of 15.9 DBH. Four trees were cored and growth rates ranged from 20 to 26 years per inch. The mean growth rate for this area is 25 years per inch.

**Survey Zone 8** - This area consist of a narrow strip of land located south of Skiatook Spillway. This area is planned for low density development such as nature trails. It is approximately 34 acres and varies from steep and rocky terrain along the shoreline to relative flat on top. Forest cover consists of dense Post Oak and Blackjack Oak with few openings on steep slopes to open savannahs on top. Total trees inventoried are 352 in this area with diameters ranging from 12" to 23" in DBH and a mean of 15.2" DBH. Four trees were

cored and growth rates ranged from 20 to 30 years per inch. The mean growth rate for this area is 25 years per inch on steep slopes and 16 on top.

Appendix A  
Tables

Survey Summary

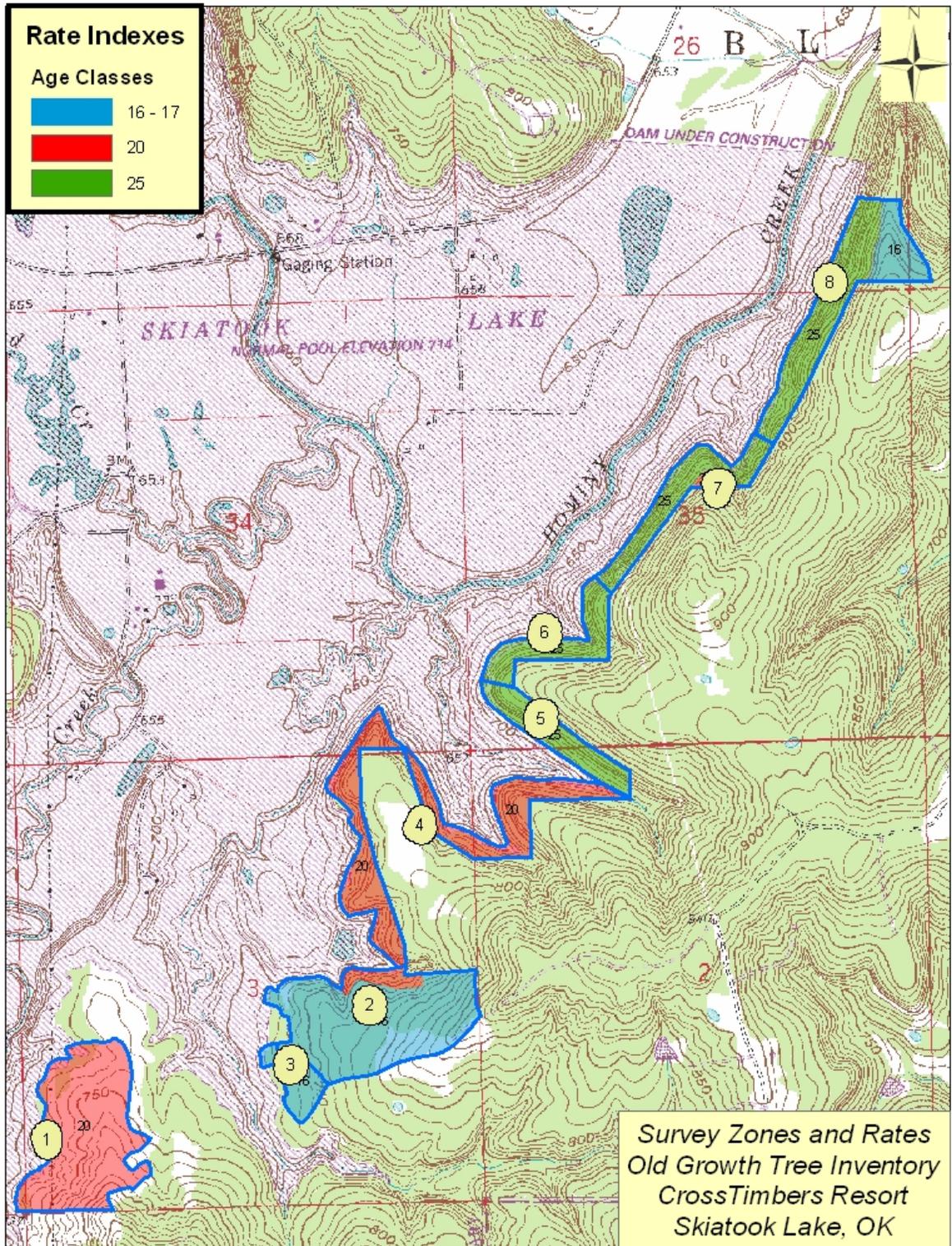
Survey Zones	Number of Trees	Acres	Min Growth Rate	Max Growth Rate	Mean Growth Rate	Age Index	Trees => 200 Yrs. Old
Zone 1	32	47	20	20	20	20	7
Zone 2	63	55	16	25	19	16 & 20	4
Zone 3	1	7				16	1
Zone 4	33	39	15	25	20	20	13
Zone 5	82	14	20	25	23	25	22
Zone 6	72	14	22	26	24	25	42
Zone 7	148	18	23	23	23	20 & 25	62
Zone 8	352	34	16	30	17 & 25	17 & 25	83
<b>Total</b>	<b>783</b>	<b>328</b>	<b>-</b>			<b>-</b>	<b>234</b>

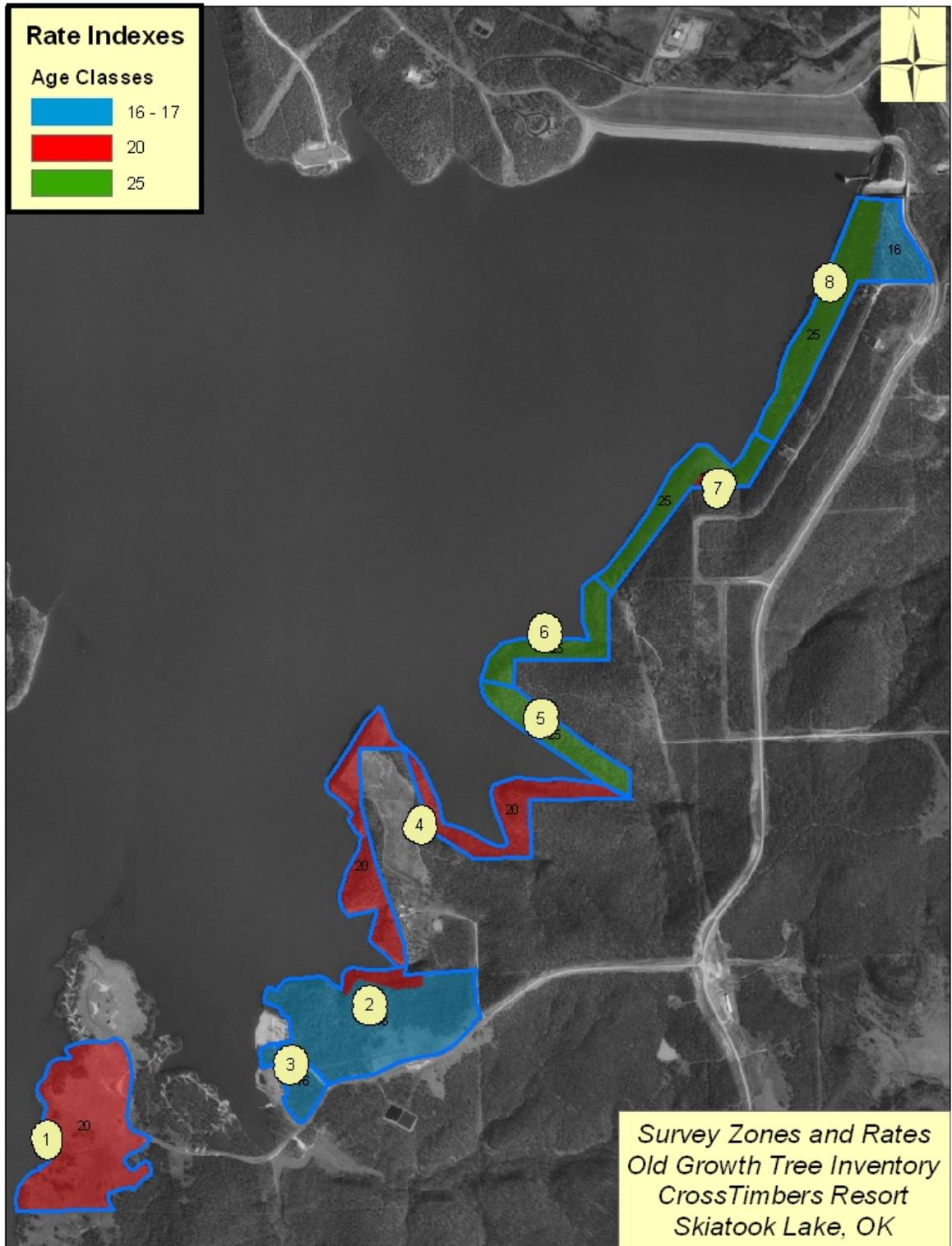
Note: Multiple Age Indexes used in some areas due to different site conditions. Age Index 25 used for portions of Zones 6, 7 and 8 located along steep slopes.

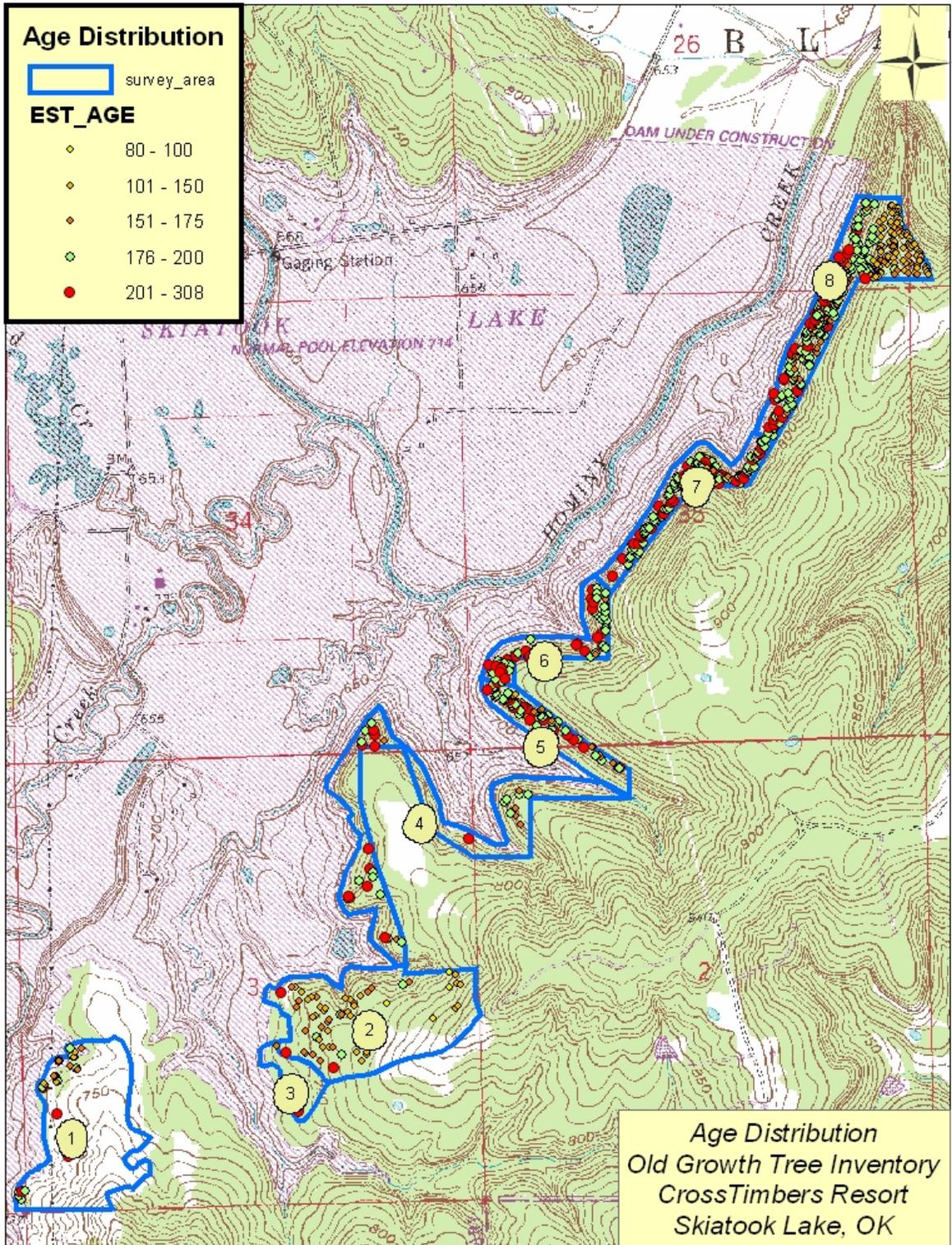
Trees Per Survey Zone

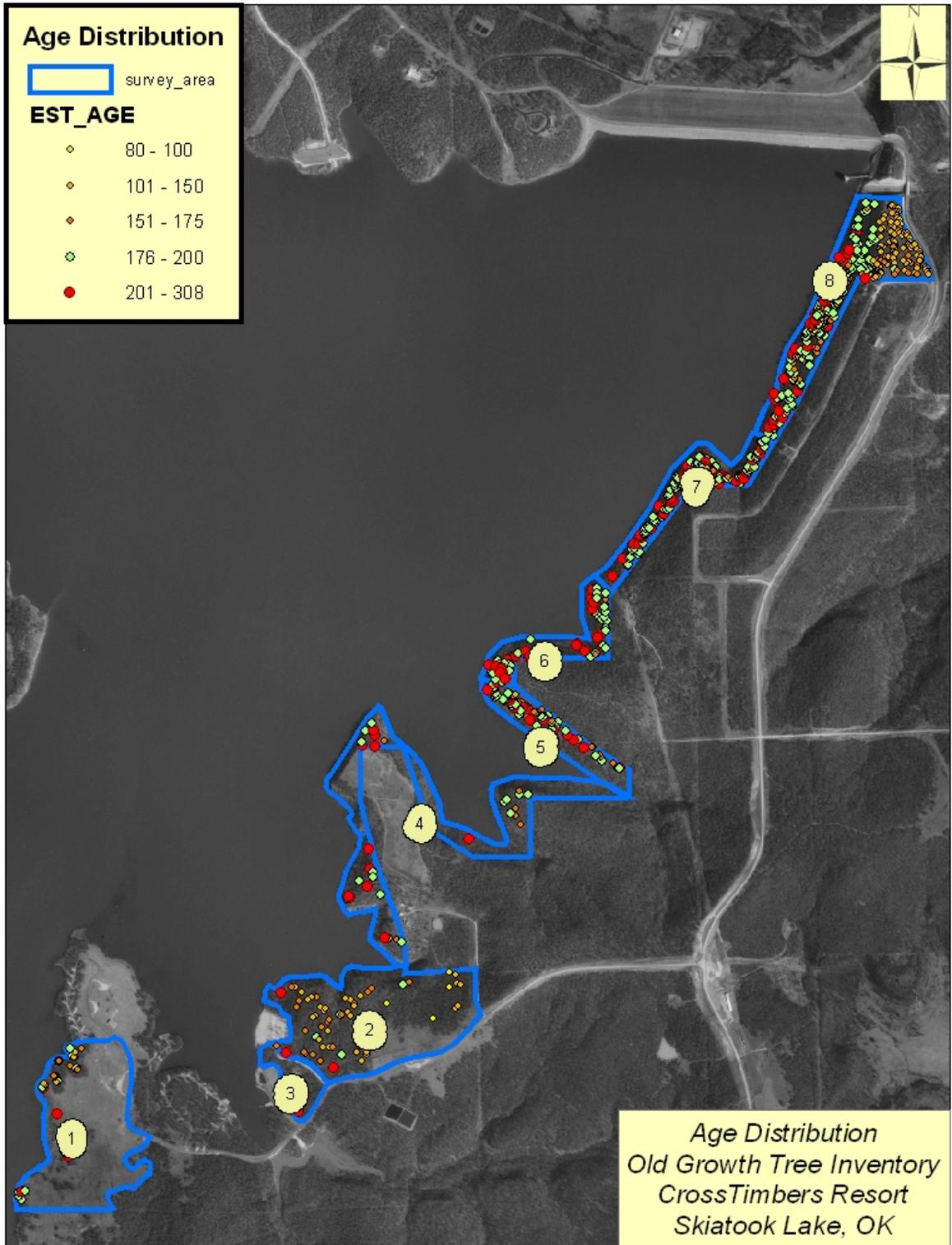
DBH	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8			Total Trees
10	0	1	0	0	0	0	0	0			11
11	0	0	0	0	4	0	0	0			15
12	2	3	0	0	10	0	1	16			44
13	3	1	0	0	16	3	10	50			96
14	3	8	0	0	18	11	44	91			189
15	0	0	0	2	12	16	26	51			122
16	6	11	0	4	7	11	34	74			163
17	4	3	0	2	7	11	9	27			80
18	7	13	0	3	5	8	14	24			92
19	0	4	0	8	2	3	5	10			51
20	3	13	0	3	0	1	2	4			46
21	0	0	0	2	1	1	1	3			29
22	3	3	0	4	0	5	1	1			39
23	0	0	0	2	0	1	1	1			28
24	0	0	0	2	0	0	0	0			26
25	0	0	0	0	0	0	0	0			25
26	1	3	0	1	0	0	0	0			31
27	0	0	0	0	0	0	0	0			27
28	0	0	1	0	0	1	0	0			30
<b>Total</b>	<b>32</b>	<b>63</b>	<b>1</b>	<b>33</b>	<b>82</b>	<b>72</b>	<b>148</b>	<b>352</b>			<b>783</b>

Appendix B  
Survey Maps









Appendix C  
Photographs

## Core Sampling



## Characteristics of Old Growth Trees



Old "Nubs" indicated old limb scar healing



## PART II

### Inadvertent Discovery of Cultural Resources Plan

#### **Purpose:**

Project construction and operation may lead to the inadvertent discovery of cultural resources within project boundaries. Protecting cultural resources is a priority during the development and operation of the CrossTimbers Resort and Golf Course and is embodied in the project policy regarding cultural resources:

"To be effective stewards of cultural resources located on CrossTimbers Resort and Golf Course grounds, by proactively establishing guidance and procedures for the management of cultural resources, developing relationships with interested stakeholders, and providing support to contractors concerning cultural resource awareness and policy compliance."

#### **Scope:**

The CrossTimbers Cultural Resource Inadvertent Discovery Plan contains criteria to ensure proper protection and management of cultural resources inadvertently discovered on the CrossTimbers Resort and Golf Course grounds. It incorporates actions necessary to comply with the law, identification of reporting requirements for "inadvertent discoveries", and training required to ensure contractors and project staff understand responsibilities and foster a stewardship ethic within the CrossTimbers Resort and Golf Course.

#### **Cultural Resources:**

"Cultural resources" are buildings, structures, archeological resources, sites, districts, objects, traditional cultural properties, and other evidence of past human life ways.

#### **Cultural Resources Management Team:**

The CrossTimbers Environmental Management Planning Team will manage the CrossTimbers Inadvertent Discovery of Cultural Resources Plan. Concerns about the Plan should be directed to Dr. John Lamberton or Dustin Huff. The EMP Team will have the following responsibilities concerning the inadvertent discovery of cultural resources during the construction and operation of the project:

- a. Conduct training to assure that contractors are aware of the Inadvertent Discovery Plan;

- b. Ensure that all construction activities are in compliance with applicable cultural resource regulations and laws;
- c. Implement provision steps for inadvertent discoveries of cultural resources;
- d. Coordinate consultation with the USACOE in the event of an inadvertent discovery of cultural resources.

### **Policy**

*In the event that cultural resources are encountered during any construction or excavation activities, the activity must stop and a member of the CrossTimbers EMP Team must be notified in person or by phone. Failure to report discovery of cultural resources may result in the violation of federal laws and regulations, which may lead to project delays and individual fines and penalties.*

### **Procedures**

*CrossTimbers staff, contractors, and sub-contractors conducting work on the CrossTimbers project will be made aware of their responsibilities concerning the inadvertent discovery of cultural resources during construction and implementation of other ground-disturbing activities related to CrossTimbers development and operation.*

*A. Any construction or ground-disturbing activity, as noted above, shall be halted immediately in the event of any of the following:*

- *Discovery of items such as pottery, bottles, arrowheads, stone flakes, bullets, structures or portions of structures (including foundations), bones of any type, or any portion or piece of any of the foregoing items.*
- *Discovery of evidence of past fill operations, dumping, or trash disposal which may include materials such as metal, wooden objects, glass, ceramics, etc., of historic age.*

*B. In the event that any of the foregoing items are encountered, activities affecting those items shall be halted immediately and a member of the CrossTimbers EMP Team shall be contacted promptly for appropriate guidance. Current members of the CrossTimbers EMP Team members are:*

- *Dr. John Lamberton, EMP Team Leader, 918.382.9650*
- *Dustin Huff, Project Manager / StateSource, L.L.C., 918.607.1886*

### **TRAINING**

*It is the policy of the CrossTimbers Resort and Golf Course that cultural resource training will be provided to all direct contractors of StateSource, L.L.C. and employees who carry out some or all of CrossTimbers' cultural resource compliance*

responsibilities. The purpose of this training is to increase awareness and knowledge of CrossTimbers' cultural resource stewardship responsibilities. Completion of this training will be a requirement for all direct contractors and employees of StateSource, L.L.C

Upon completion of this training, participants will be able to:

- Recognize a potential cultural resource.
- Understand CrossTimbers' policy and procedures for identifying and protecting cultural resources.
- Locate and receive assistance from CrossTimbers EMP Team members.
- Document and safeguard potential cultural resource locations.
- Describe steps to be taken when cultural resources are encountered.

The CrossTimbers EMP Team, following guidance provided by USACOE cultural resource professionals, will provide Cultural Resource Training. The training will include cultural resource identification and proper provisions for handling inadvertent discoveries of cultural resources.

**Contractors, Subcontractors, and Project Staff:**

Please read the Inadvertent Discovery of Cultural Resources Plan and sign this statement:

I hereby certify that I have read the CrossTimbers Inadvertent Discovery Of Cultural Resources Plan. I have completed the Training Program for the Plan and completely understand my duties and responsibilities under this Plan while I am involved in the construction, operation, and maintenance of the CrossTimbers Project on Skiatook Lake.

Signed: \_\_\_\_\_

Company: \_\_\_\_\_

Date: \_\_\_\_\_

### Part III

## Aquatic & Terrestrial Mitigation Plan for the CrossTimbers Resort & Golf Course on Skiatook Lake

### Introduction

Historically, the USACE (Corps) has created lakes for various uses including flood control, water supply, water quality, navigation, fish and wildlife management, power, and recreation. Although Skiatook Lake was created for several of the aforementioned uses, recreational use was a major component of the master plan for the Lake. Recreational development was contemplated through land use allocations assigned to Corps property when Skiatook Lake was created. These land use allocations are classified as wildlife management, recreation lands, recreation low density, recreation intensive, and project operations.

### The CrossTimbers Development

The CrossTimbers Resort and Golf Course is located on approximately 700 acres of Corps property on Skiatook Lake. There are four land use allocations within the CrossTimbers leased property: recreation low-density, recreation lands, recreation intensive, and project operations. Under the land use allocation criteria detailed in the Skiatook Lake Master Plan, all of the CrossTimbers development meets the land use criteria except for the Marina and cabins slated for the leased property running north from the Tall Chief Cove area, through Tornado Cove, including the land on the point at the northwest entrance to the Cove, herein referred to as the "Tornado Cove Area". The Marina and cabins constitute a more intense recreation activity than is contemplated by the recreation low density land use allocated to the Tornado Cove Area. Thus, the proposed development in the CrossTimbers land plan exceeds the land use allocation for the Tornado Cove Area. The exceedance applies to approximately 40 land acres and 20 lake acres that comprise the anticipated footprint for the Marina. The exceedance for the Tornado Cove Area will be mitigated.

There is also an undefined difference between the recreational activities planned for Skiatook Point and the project operations land use allocated for approximately 75 acres of the leased premises on Skiatook Point. There may be an

interpretative exceedance between the recreational activities planned for Skiatook Point and the criteria for recreational activities contemplated by the project operation land use allocation. Although the exceedance is vague and may not actually exist, the CrossTimbers project stipulates that the exceedances, whether real or interpreted, will be mitigated.

### **Mitigation**

Mitigation for the loss of wildlife habitat due to anticipated recreational development occurred at the time Skiatook Lake was created. Mitigation compensation was "banked" or "credited" in the form of land use criteria allocated on Corps property. Since most of the CrossTimbers development is designed within the criteria for land use on Corps property, mitigation compensation is achieved through banked mitigation credits. Additional mitigation compensation applies to instances in which proposed recreation activities exceed the land use allocations included in the Skiatook Lake Master Plan. The only exceedance in the CrossTimbers development from any land use allocation criteria in the leased premises occurs within the Tornado Cove Area and impacts approximately 60 acres of proposed development. Mitigation compensation will occur by exchanging 60 acres in the Tornado Cove Area with 60 acres reallocated to recreation low density use on a portion of Corps property allocated for recreation intensive use, i.e., Gouin Point, Twin Points, etc.

In order to abate any future confusion regarding the usage of approximately 75 acres of leased premises allocated for project operations on Skiatook Point, the project operations acreage will be added to the 60 acres in the Tornado Cove Area for which mitigation compensation will occur. At a mitigation ratio of one to one, approximately 135 acres impacted by land use exceedances in the CrossTimbers leased premises will be exchanged for 135 reallocated acres on another part of CORPS property on Skiatook Lake. Should more than 135 acres be reallocated as part of this mitigation compensation, each acre over 135 will be "banked" for any future mitigation compensation needs of the CrossTimbers development on Skiatook Lake.

The CrossTimbers Aquatic & Terrestrial Mitigation Plan will compensate for project impacts by replacing or providing substitute resources or environments in the following ways:

## Terrestrial Mitigation

1. Reallocate a minimum of 135 acres with similar habitat value on Skiatook Lake from recreation intensive usage to recreation low intensity usage such as Gouin Point, Twin Points, etc.

Aquatic Mitigation - It is anticipated that there will be an increase in the aquatic habitat value of Tornado Cove through the following mitigation compensation measures:

1. Chain over timber in Tornado Cove to increase the area of lake bottom covered by timber.
2. Establish fish attractors that may include the following:
  - Christmas trees solicited from the Skiatook community on a voluntary basis for three years.
  - Oak trees and understory from project construction.
  - The structure of the Marina.

## **CrossTimbers EMP Best Management Practices**

In addition to the in-kind mitigation compensation outlined earlier in this document, the best management practices and procedures outlined in the CrossTimbers Environmental Management Plan naturally promote continuous mitigation of developmental impacts through numerous out-of-kind mitigation alternatives. These alternatives may include designing the project to protect fish and wildlife resources and promoting public access to these resources; locating structures and infrastructure in the least environmentally damaging sites; and selectively clearing trees or other habitat manipulation. They may include seeding, fertilizing and treating areas as necessary to restore fish and wildlife resources; planting shrubs and trees and other vegetation to speed recovery; controlling polluted spoil areas; restocking fish and wildlife resources in repaired areas; and by returning areas within the lease to native conditions through management activities, which may include thinning of trees, controlled burn, etc. They may also include periodic monitoring of the development to assure continuous environmental stewardship and proper training of project personnel in the construction and operations of the facility to preserve fish and wildlife resources. They may further include environmental management planning and certification programs including but not limited to LEEDS, Fire Safety Programming, and Clean Marina designation.

### **Banked Mitigation**

The CrossTimbers development intends to bank mitigation credits through the execution of its Environmental Management Plan for future project needs upon Corps approval. Banking of habitat value for the express purpose of compensation for unavoidable future losses will be considered to be an additional mitigation measure.

**Project Number:** 1

**EMP Project Title:** Ancient Timbers Mapping (Old Growth Tree Inventory).

**Associated Environmental Aspect:** Construction Activities.

**Target/Goal:** To map the Ancient Timbers (Old Growth Tree Inventory) on the leased property. The inventory will provide a guide for CrossTimbers land planning so that the final project footprint will minimally impact Old Growth trees in the leased area. The land planners will superimpose the Old Growth Tree Inventory maps over the proposed land plan such that project components, i.e., conference center, Marina, retail stores, restaurants, golf course, etc., will be located in those areas which minimally impact the Ancient Timbers to the extent practicable and feasible.

**Scope:** Entire Development.

**Reference Documents:** CrossTimbers Environmental Assessment and SEDA/StateSource Lease with USACOE.

**Definitions:** Old Growth Trees (Ancient Timbers): Although there appears to be little agreement on just how old an Ancient Timber should be to be classified as Ancient, the Ancient Cross Timbers Consortium describes the Ancient Cross Timbers forest type (Post Oak and Blackjack Oak) as a forest type that tends to dominate dry, rocky positions, and includes Post Oak trees 200 to 500-years old.

**Primary Stakeholder Responsibilities:**

- SEDA/StateSource – project review.
- USACOE – project review.
- CrossTimbers Environmental Management Team – conduct a phased Old Growth Tree inventory on the leased property prior to construction.

**Procedure:** See Appendix 1, Old Growth Tree Inventory, CrossTimbers Resort, (Phase I).

**Time Frame:** The Ancient Timbers Mapping will occur in three phases.

**Phase I:** Completed September – October, 2003.

**Work Instructions**

The work instructions were developed and agreed upon by the USACOE and the CrossTimbers EMP Development Team.

Date: 10.15.03 - 2<sup>nd</sup> Amendment to the Document submitted on 9.08.03.

To: Mr. Jim Harris

From: The CrossTimbers EMP Development Team  
Mr. Blu Hulsey, SEDA  
Mr. Dustin Huff, StateSource  
Dr. John Lamberton, EMP Consultant and Team Leader  
Mr. Jeff London, Professional Forester

We are pleased that we will begin officially mapping the Ancient Timbers as required in the SEDA lease. As a part of the information and language that will comprise sections of the CrossTimbers EMP, we are reconfirming the following work instructions upon which we agreed for the first three preliminary mapping exercises:

- a. The Ancient Timbers mapping project begins the data collection phase of the first of four components required by the USACE in the CrossTimbers EMP. The CrossTimbers EMP component development process began on September 1, 2003 with a completion timetable of approximately December 1, 2003.
- b. The mapping project will begin on Thursday, September 25, at 9:30 a.m. at the Corps office on Skiatook Lake. The procedures for the mapping project were jointly planned and agreed upon by the CrossTimbers EMP Development Team and the USACE after thoroughly vetting the work procedures outlined in this memo during three preliminary mapping exercises involving you, Greg Bersche, Dustin Huff, Jeff London, and Dr. John Lamberton.
- c. The CrossTimbers Development Team consisting of Blu Hulsey, Jeff London, John Lamberton, and Dustin Huff, will survey candidate Ancient Timbers. Jeff London, a registered professional forester, will map candidate Ancient Timbers with a state-of-the-art GPS unit that will be used to collect the mapping data for the CrossTimbers EMP.
- d. As an exercise of the policy approved by the USACE concerning the mutual cooperation necessarily inherent in the public/private relationship that forms the basis for the Demonstration Lake Project on Skiatook Lake, a USACE team of Jim Harris and Greg Bersche will review the Ancient Timber mapping exercise on a continuous basis during the exercise. Due to the continuous review process by the USACE team, a lease area will be considered adequately mapped at the end of each day by mutual agreement of the CrossTimbers EMP Development Team and the USACE team.
  - Ancient Timbers will be defined as those Post Oak trees over 200 years old. Candidate Ancient Timber will be defined as those trees displaying characteristics that may qualify them to be Ancient Timber. Characteristics of candidate trees include but are not limited to diameter in relation to soil quality; nubs or scars from branch loss; and treetops that are gone or partially gone. Information including the nutrient conditions and the topography of the area immediately

surrounding a tree (such as the presence and quantity of sandstone or limestone rocks) will contribute to the determination that the tree is an Ancient Timber candidate. Candidate trees will be cored to determine which trees actually qualify as Ancient Timber at future times deemed appropriate and necessary by the mapping team.

- e. No dead trees will be mapped.
- f. The mapping project will begin in the campground area near the John Zink Ranch and will move northeastward in 100-foot increments unless the terrain dictates otherwise. The 100-foot measurement increments may be increased and/or decreased depending upon the terrain of the lease area.
- g. The lease area on the southeast side of the lake that will contain the camping area, village, and the marina (Project Development Phase I) will be mapped first. Skiatook Point will not be mapped until such time that the development of that part of the lease area is more imminent.
- h. Candidate Ancient Timbers will not be cored to determine their age until a conflict develops between the final CrossTimbers land plan and the actual location of candidate Ancient Timbers.

**Phase II:** Will begin December 2003 and completed during the subsequent 180-day period.

- a. Initial Schedule: 9 a.m. Thursday, December 18, 2003, and 9 a.m. Friday, December 19, 2003
- b. Meet at the Skiatook Lake Corps office.
- c. Greg Bersche, Jeff London, and John Lamberton will map on Thursday. Jim Harris, Dustin Huff, Jeff London, and John Lamberton will map on Friday. Blu Hulseby will join the team as his schedule allows.
- d. The leased area south of Tall Chief Cove Road will be mapped. Jeff London estimates that the Phase II map area is slightly over 100 acres in size. He has also estimated that at 200 ft. transit widths, it will require 15 to 16 transits to complete Phase II. His estimate to complete Phase II is two full days of mapping.

**Phase III:** Initiated and completed during 2004.

**Expenses:** \$25,000.

**Environmental Benefit:** The environmental benefit will be the preservation of the Ancient Timber natural resources on leased property.

**Project Number:** 3

**EMP Project Title:** Aquatic and Terrestrial Mitigation Plan

**Associated Environmental Aspect:** Construction

**Target/Goal:** Mitigate for the aquatic and terrestrial footprint of the CrossTimbers project on the acres that exceed the existing land use allocations.

**Process:**

### **Terrestrial Mitigation**

Terrestrial mitigation will occur by compensating for 135 acres of the CrossTimbers development that exceeds the land use allocations for the leased property on Skiatook Lake. The compensation transaction will involve reallocating a minimum of 135 acres with similar habitat value on Skiatook Lake from recreation intensive usage to recreation low intensity usage such as Gouin Point, Twin Points, etc.

### Aquatic Mitigation

The aquatic habitat of Tornado Cove will increase in value by utilizing the following mitigation compensation measures:

- Chaining over timber in Tornado Cove to increase the area of lake bottom covered by timber.
- Establishing a minimum of two fish attractors that may include the following: Christmas trees solicited from the Skiatook community on a voluntary basis for three years; and Oak trees and understory from project construction.
- Utilizing the structure of the Marina to provide additional aquatic habitat.

**Expenses:** \$10,000

**Environmental Benefit:** Compensate for the aquatic and terrestrial footprint of the CrossTimbers project on the acres that exceed the existing land use allocations.