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Results of Archaeological Monitoring of the Spring Lake Section 206 Aquatic Ecosystem Restoration Project, Texas State University-San Marcos, Hays County, Texas

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Results of Archaeological Monitoring of the Spring Lake Section 206 Aquatic Ecosystem Restoration Project, Texas State University-San Marcos, Hays County, Texas

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CENTER FOR ARCHAEOLOGICAL STUDIES
Texas State University-San Marcos
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Results of Archaeological Monitoring of the Spring Lake Section 206 Aquatic Ecosystem Restoration Project, Texas State University-San Marcos, Hays County, Texas

by Carole A. Leezer, David M. Yelacic,
Amy E. Benton, Jacob Hooze, and Patricia Christmas

Principal Investigator: Carole A. Leezer

Archaeological Studies Report No. 30

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Texas State University-San Marcos
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Texas Antiquities Permit No. 5582

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MANAGEMENT SUMMARY

Project Title: Archaeological Monitoring of the Spring Lake Section 206 Aquatic Ecosystem Restoration Project

Project Description: Archaeological monitoring of the demolition, construction, and restoration activities conducted during the Spring Lake Section 206 Aquatic Ecosystem Restoration Project.

Local Sponsor: Texas State University-San Marcos

Federal Agency: United States Army Corps of Engineers

Institution: Center for Archaeological Studies, Texas State University-San Marcos

Principal Investigator: Carole Leezer

Project Archaeologist: David Yelacic and Amy Benton

Supervising Underwater Archaeologist: Fritz Hanselmann

Crew Members: David Yelacic, Jacob Hooge, Veronica Suarez, Amy Benton, and Patricia Christmas

Texas Antiquities Permit: 5582

Dates of Work: October 2011 through August 2012

Total Acreage Evaluated: approximately 41 acres

Purpose of Work: Monitor demolition, construction, and restoration activities conducted during the Spring Lake Aquatic Ecosystem Restoration Project to ensure minimal impact to known archaeological deposits and to document archaeological deposits encountered during activities.

Number of Sites: 2—State Archeological Landmarks 41HY160 and 41HY165

Curation: Center for Archaeological Studies, Texas State University-San Marcos

ABSTRACT

The Center for Archaeological Studies (CAS) at Texas State University-San Marcos conducted archaeological monitoring investigations in association with the Spring Lake Aquatic Ecosystem Restoration Project between October 2011 and July 2012. These archaeological monitoring investigations were the result of mitigation efforts proposed in the Historic Properties Treatment Plan drafted in accordance to the Memorandum of Agreement (MOA) signed and enacted between the U.S. Army Corps of Engineers, Texas State University-San Marcos, and the Texas Historical Commission. Archaeological monitoring investigations consisted of monitoring all demolition and ground-disturbing activities conducted during the course of the Spring Lake Aquatic Ecosystem Restoration Project. All cultural deposits or potential cultural deposits were identified, assessed, and documented during the project by archaeological monitors, and time-diagnostic artifacts were collected. Locations of deposits were recorded and uploaded to a GIS database of the Spring Lake area for future reference. No significant cultural remains were identified or impacted by demolition and ground-disturbing activities of the Spring Lake Aquatic Ecosystem Restoration Project.

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CHAPTER 1

INTRODUCTION

The Center for Archaeological Studies (CAS) at Texas State University-San Marcos (TxState) conducted archaeological monitoring of the demolition, construction, and restoration activities associated with the Spring Lake Section 206 Aquatic Ecosystem Restoration Project (SLAERP). Work was conducted by CAS employees who meet or exceed the requirements for professional archaeologists as stated in Chapter 26, Rules of Practice and Procedure for the Antiquities Code of Texas. The SLAERP proposes to restore the aquatic ecosystem components of Spring Lake and riparian corridor/grassland habitat located directly adjacent to the lake to a more natural condition within the constraints of existing land uses. The undertaking includes removal of existing structures and facilities at the Aquarena Center, removal of all submerged structures, restoration of valuable aquatic and terrestrial habitats throughout the Spring Lake peninsula, removal of exotics, creation of a vegetated buffer zone between the golf course and Spring Lake, and construction of new and rehabilitated trails, traffic control gates, fencing, a rest room facility, picnic tables, benches and signage. This work is being conducted under Section 206 of the Water Resources Development Act of 1996 that provides authority for the U.S. Army Corps of Engineers (USACE) to restore aquatic ecosystems (Figure 1-1).

The USACE, Fort Worth District, is the lead agency for this project. The non-federal, local

sponsor, TxState, is acting as a participatory agency in this restoration project. The USACE, with the concurrence of the Texas State Historic Preservation Officer (SHPO) at the Texas Historical Commission (THC), has determined the Area of Potential Effect (APE) to be ten acres of floodplain habitat on the Aquarena Center peninsula, nine acres of riparian corridor habitat along the shoreline of Spring Lake, and 22 acres of lacustrine habitat within the headwaters of the San Marcos River. The USACE has consulted with the SHPO and the Advisory Council on Historic Preservation (Council), pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. During the consultation, the USACE and the SHPO determined that the undertaking would have an adverse effect upon known properties included in or eligible for inclusion in the National Register of Historic Places (NRHP), and designated as State Archeological Landmarks (SAL). Potential also existed for negative impacts on yet-unknown resources that might be present in the APE. A Memorandum of Agreement (MOA) between the USACE, TxState, and the SHPO regarding the SLAERP was signed and enacted in June 2009 (Appendix A).

Under the MOA, a Historic Properties Treatment Plan (HPTP) was developed and implemented to ensure that the SLAERP would avoid or minimize impacts to cultural resources within the APE. The HPTP included

Figure 1-1. Project location.

five subsections that were subject to review and acceptance by the USACE Cultural Resources Office. These five subsections included: 1) the development and implementation of a subsurface testing program to determine the extent of intact cultural deposits within the project area; 2) development of measures to coordinate closely with the project design team and convey cultural resource information to assure avoidance of

historic properties during specific design phases of the project; 3) development and implementation of an excavation plan for each recorded site prior to construction; 4) development and implementation of an archaeological monitoring program to monitor all ground-disturbing activities during the construction and restoration phases of the project (represented by the current document); and 5) a treatment plan to address adverse

effects to cultural resources and unanticipated discoveries.

A subsurface assessment of archaeological resources in the APE was conducted in June through July of 2010 (Leezer et al. 2011). As a result of this assessment, recommendations for modifying recorded site boundaries for SALs 41HY160 and 41HY165 were proposed to reflect the presence of previously undocumented cultural materials. It was determined that two previously recorded sites in the APE, 41HY147 and 41HY161, would not be adversely affected by the undertaking as designed. Based on the results of the survey and subsurface testing program (Leezer et al. 2011), CAS concluded that remains associated with SALs 41HY160 and 41HY165 would be adversely affected by the proposed undertaking.

During the subsurface assessment, it was determined that the archaeological sites located within the APE had never been completely delineated by prior archaeological investigations. In response, the survey and subsurface testing investigations (Leezer et al. 2011) sought to recover data to define more precisely the horizontal boundaries of these deposits, or at least the portions of them that exist within the APE. It became evident that cultural deposits appear in an almost continuous nature across the APE. Therefore, CAS defined Archaeologically Sensitive Areas (ASAs) that (1) represent intact and near-surface archaeological deposits that were associated with one of the SALs, (2) had the very high likelihood of containing significant deposits, and (3) would be adversely affected by the proposed undertaking. Six ASAs were defined (Leezer et al. 2011) within the APE (Figure 1-2).

FIGURE 1-2. REDACTED

Figure 1-2. Archaeologically sensitive areas identified during survey for the Section 206 Spring Lake Aquatic Ecosystem Restoration Project.

CHAPTER 2

ENVIRONMENTAL CONTEXT

The APE for the Spring Lake Section 206 Aquatic Ecosystem Restoration Project includes Aquarena Center, Spring Lake, and a portion of the TxState golf course (Figure 2-1) all located within the city limits of San Marcos on the TxState campus. The City of San Marcos is located in Hays County, in southeastern Central Texas. Spring Lake is fed by an artesian spring located at the base of the Balcones Escarpment, which marks the boundary between the Edwards Plateau (Hill Country) and the Blackland Prairie. This ecotonal zone (a transition area between two adjoining large-scale environmental provinces) is an area capable of supporting tremendous faunal and floral diversity (Crumley 1994) and is likely

to have supported dense human occupations in the past.

The San Marcos Springs, known to early European settlers as St. Mark's, to the Tonkawas as Canocanayesatetlo, and today as Aquarena Springs (Brune 2005), attracted human populations for over 11,500 years. Historically, the springs served as an important stop on the El Camino Real and the Chisholm cattle trail. Currently, they are the second largest springs in Texas and support a tremendous amount of wildlife. The springs serve as the headwaters of the San Marcos River, which has provided power to gin, corn, saw, and grist mills, and an ice factory in recent history.

Figure 2-1. Spring Lake Aquatic Ecosystem Restoration Project APE, outlined in yellow.

Figure 2-2. Project area soils.

The Aquarena Center and the TxState golf course are situated at the base of the Balcones Escarpment on a deep, frequently flooded alluvial terrace at the confluence of the headwaters of the San Marcos River and its adjacent intermittent tributary, Sink Creek. Clear artesian waters emanate from approximately 200 small springs and three large fissures along the Balcones Fault. Fluvial terrace deposits (Qal) composed of eroded gravel, sand, silt, and clay from the Edwards Plateau formed along the upper San Marcos River from the Late Pleistocene to Late Holocene. Soils within the proposed project area consist primarily of Oakalla clay loam (Ok) and Tinn clay (Tn) (Batte 1984). Oakalla clay loam (Ok) soils are generally dark grayish-brown in color, moderately alkaline and calcareous throughout, with approximately 60 percent

calcium carbonate, and contain an extremely firm to very hard, moderate, fine sub-angular blocky clay structure (Batte 1984:34, 75). This compact structure allows for less cracking and movement than other clays. This means that archaeological investigations within these soils should be less hampered by the movement of artifacts as a result of cracking dynamics. Tinn clay (TN) is generally dark gray to grayish-brown in color, and like Oakalla soils, is moderately alkaline and calcareous. Its structure, however, ranges from moderate, medium and sub-angular to weak, medium, blocky. As a result of its structure, it is more likely to crack, thus allowing for possible vertical movement of artifacts (Figure 2-2).

Six Depositional Units (Units) of the Aquarena Center peninsula were identified

Figure 2-3. Reconstructed geoarchaeological cross section of Sink Creek Valley, looking upstream, illustrating alluvial units and their expected prehistoric preservation (redrawn from Nordt 2010: Figure 6-8).

by Dr. Lee C. Nordt (2010) during the 2001 investigations of archaeological site 41HY160. Units A through F were defined as reflecting changes in the course of Sink Creek, periods of increased and decreased stream flow, and

changes in the resulting depositional regimes. These Units were deposited in chronological order, from oldest to most recent, and range from Paleoindian (A) to Late Prehistoric and Historic periods (F) (Figure 2-3).

CHAPTER 3

CULTURAL AND ARCHAEOLOGICAL BACKGROUND

Cultural Context

Human presence within the region is divided into three periods: Prehistoric (including Paleoindian, Archaic, and Late Prehistoric), Protohistoric, and Historic. Evidence for prehistoric occupation in and around the San Marcos Springs extends from the Clovis period approximately 11,500 radiocarbon years ago up until the arrival of Spanish explorers about 260 years ago. Historic documents record the use of the springs by Spanish and Native American groups in the seventeenth, eighteenth, and nineteenth centuries, and as early as the mid-nineteenth century by Anglo settlers such as General Edward Burleson.

Spring Lake is in a transitional zone in terms of cultural influences, with traits present from Central Texas, South Texas, and, to a lesser degree, the Upper Coast of Texas (Goode 1989). Patterson (1995) has synthesized the chronological evidence for Southeast Texas, including the Upper Coastal Region. The cultural chronologies for Central and South Texas are not completely understood, but recent syntheses are presented by Black (1995), Hester (1995, 2004), and Collins (1995, 2004). Dates for prehistoric periods and parts of the Protohistoric that are derived from archaeological contexts are presented in radiocarbon years before present (or 1950). Dates in the historic period are based on written accounts and are given in calendar ages.

Prehistoric

Paleoindian

The Paleoindian stage marks the earliest human occupation of North America and extends until approximately 8000 BP. According to Hester (1995:433–436, 2004), the Paleoindian period occurred between 11,200 and 7950 BP in South Texas. Collins (1995:381–385, 2004) dates it to 11,500–8800 BP in Central Texas. Diagnostic Paleoindian artifacts include Clovis, Folsom, and a variety of later types (Bousman et al. 2004). Early Paleoindian peoples are thought of as highly nomadic cultures that relied heavily on hunting large game animals such as mammoth, mastodon, bison, camel, and horse (Black 1989). Of these, all but bison were extinct by the end of Clovis times. Research has shown that Paleoindians utilized a wide variety of plants and animals, such as raccoons, badgers, mice, alligators, turtles, and tortoises (Black 1989; Bousman et al. 2004; Collins and Brown 2000; Hester 1983; Lemke and Timperley 2008).

A large distribution of Clovis points across North and Central America suggests a wide dispersal of their makers (Wenke 1990:201). These points are lanceolate in shape, with a thinned base resulting from “fluting,” or the removal of one or more channel flakes, and are often found associated with the remains of large, now-extinct herbivores. Site types include open camp sites, quarries, and caches, though kill sites are the best known. Other artifacts associated with Clovis are specialized bifaces, prismatic

blades and blade cores, engraved stones, bone points, stone bolas, ochre, and shaft straighteners.

Clovis is followed by Folsom and Midland-style points, with the latter types overlapping slightly (Holliday 1997). Folsom points are fluted and are found in association with ancient bison remains, while Midland points are manufactured through pressure collateral flaking, but lack fluted channels. Very thin bifaces, called ultrathin bifaces, are also found at some Folsom sites (Stanford and Broilo 1981). Folsom peoples are considered to have been specialized bison hunters. Most Folsom sites occur as surface scatters, although deeply buried deposits have been uncovered. Artifacts associated with this interval are common throughout Texas (Bousman et al. 2004).

Following the extinction of most large game animals in Texas, hunters concentrated on deer, antelope, and other game (Bousman et al. 2002, 2004). Between 10,000 and 8000 BP, Central Texas was characterized by a series of cultural groups based on changing projectile point styles, which transformed from stemmed to lanceolate, and then back to stemmed. Changes in the subsistence base eventually required technological shifts that now mark the beginning of a new cultural period known as the Archaic.

Archaic

Collins (1995, 2004) dates the Archaic in Central Texas from approximately 8800 to 1200/1300 BP (other archaeologists suggest that the Archaic began at 8000 BP). Following Weir (1976), this period is divided into Early, Middle, and Late Archaic periods. The Archaic marks several important transitions: a shift from large game hunting to hunting smaller animals; an apparent increase in the use of plant food resources and the use of ground stone in food processing; implementation of stone cooking

technology; increased use of organic materials in tool technologies and an increase in the number and variety of lithic tools for wood working; greater population stability and less residential mobility; and systematic burial of the dead. This stage is also distinguished by environmental and climatic changes and oscillations.

At the beginning of the Holocene, a significant climate change associated with the extinction of megafauna stimulated a behavioral change in land use. Groups focused more intensively on the exploitation of local resources such as deer, fish, and plant bulbs. This dietary adjustment is evidenced by the increased number of ground stone artifacts, burned rock middens, and tools such as Clear Fork gouges and Guadalupe bifaces (Turner and Hester 1993:246–256). Early Archaic sites are thinly dispersed and are seen across a wide area of Texas and northern Mexico (Weir 1976). Hester (1995:436–438; 2004) dates the Early Archaic, characterized by Early Basal Notched and Early Corner Notched dart points, to 7950–4450 BP, while Collins (1995:383, 2004) argues that the Early Archaic spans from 8800 to 6000 BP based on three divisions of projectile point types.

The Middle Archaic in Central Texas dates from 6000 to 4000 BP (Collins 1995, 2004). Collins divides the Middle Archaic into three projectile point style intervals: Bell-Andice-Calf Creek, Taylor, and Nolan and Travis. The beginning of the Middle Archaic (Bell-Andice-Calf Creek) was a mesic period when grasslands expanded southwards into Central and South Texas. This expanding habitat attracted bison herds from the Plains. People associated with Bell-Andice-Calf Creek styles were specialized bison hunters and who maintained a tool kit specifically adapted to killing and processing bison. Points were extremely thin and broad, and were made differently from the proceeding

period. The Middle Archaic in general is associated with the Altithermal, a prolonged period of warmer temperatures and increasing aridity. As the Altithermal progressed through the Middle Archaic, conditions in South and Central Texas became ever warmer and drier, and both bison and bison hunters may have retreated northwards. Taylor bifaces were manufactured during this period; these bifaces are similar to the earlier Bell-Andice-Calf Creek point styles, but lack the deep basal notches that characterize the earlier types. By the latter part of the Middle Archaic, Nolan and Travis points predominate. Both are technologically and stylistically dissimilar to the preceding styles (Collins 1995, 2004). The Nolan-Travis interval was also a period when temperature and aridity were at their peaks, and there is evidence of increased utilization of xerophytes such as sotol (Johnson and Goode 1994). These plants were typically baked in earth ovens, which are associated with middens of burned and fire-cracked rock. During drier episodes of this period, the aquifer-fed streams and resource-rich environments of Central Texas were extensively utilized (Story 1985:40; Weir 1976:125, 128).

The Late Archaic dates to approximately 4000–1300/1200 BP (Collins 1995:384, 2004). Bison herds began returning to the southern Great Plains (Dillehay 1974), again influencing subsistence. Cemeteries at sites such as Ernest Witte (Hall 1981) and Olmos Dam (Lukowski 1988) provide some evidence that populations increased and that groups were becoming territorial (Story 1985:44–45), though this pattern may have begun in South Texas as early as ca. 6500–7000 BP (Ricklis 2005). Pottery, which often accompanies increased sedentism, territoriality, and population growth, began appearing in limited areas of the South Texas Plains during the Late Archaic (Story 1985). However, most regions remained “pre-ceramic”

for another thousand years (Story 1985:45–47). Common projectile points are Ensor and Frio (Turner and Hester 1993:114,122), both of which are short, triangular points with side notches. The Frio point also has a notched base (Turner and Hester 1993:122).

Late Prehistoric

Collins (1995, 2004) dates the Late Prehistoric to 1300/1200–260 BP, and follows Kelley (1947) in dividing it into the Austin and Toyah phases. This stage is marked by the shift away from the dart and atlatl to the bow and arrow, and by the incorporation of pottery in the central and northern parts of the South Texas Plains (Black 1989:32; Story 1985:45–47). Emphasis on bison hunting during the Toyah phase was a significant factor in determining settlement and mobility patterns.

The Austin phase is characterized by small arrow points, including Edwards, Scallorn, and other types, indicating a shift from the use of atlatls to bows. Burned rock middens are sometimes associated with these types (e.g., Houk and Lohse 1993). Ground and pecked stone tools for processing plant food are increasingly common, and burials from this time reveal a high proportion of arrow-wound deaths (Black 1989; Prewitt 1974), perhaps suggesting disputes over resource availability.

The beginning of the Toyah period (750 BP) in Central Texas is marked by contracting stem points and flaring, barbed shouldered points. Perdiz is the most common example (Black 1989:32; Huebner 1991:346), and this type occasionally occurs on glass in mission contexts (e.g. Lohse 1999:268). This period is also characterized by prismatic blades, blade cores, and scrapers-on-blades, all considered part of a specialized bison hunting and processing toolkit (Black and McGraw 1985; Huebner 1991;

Ricklis 1994). The wide variety of ceramic styles and materials seen in Toyah pottery provides information on the social composition of these groups (Arnn 2005), with assemblages displaying Caddo, Texas Gulf Coast, and Jornada Mogollon influences. Johnson (1994) contends Toyah culture represents a constellation of traits shared by a limited number of groups sprawled across a very large area of Texas. Ricklis (1994) describes it as a collection of traits that moved through relatively stable regional populations. Recently Arnn (2007) has argued that a large number of cultural groups, many of which were documented by European explorers, interacted with each other over a large area, resulting in the spread of shared styles and technologies.

Protohistoric (Spanish Entrada) Period

The Protohistoric period was marked by Spanish *entradas*, formal expeditions into Texas in the late-seventeenth and early-eighteenth centuries. Hester defines the period as “the transition period between the Prehistoric and Historic period denoting a phase for which few written records are available, and for which most evidence is derived from archaeology” (1995:449–450, 2004). This period began with the venture by the Spanish explorer Cabeza de Vaca and the Narvaez expedition in 1528 and extends to the establishment of the Mission San Antonio de Valero (the Alamo) in San Antonio, in 1718.

When the Spanish missions were established in East Texas in the late 1600s, *entradas* began to travel regularly through Central Texas. These expeditions provide the first detailed observations on the original Native American inhabitants of the region. With Alonso de León’s expedition of 1680, El Camino Real (the King’s Road) was established from Villa Santiago de la Monclova in Mexico to East Texas. This roadway followed established Native American trade routes and

trails, and became a vital link between Mission San Juan Bautista in Northern Mexico and the Spanish settlement of Los Adaes in East Texas (McGraw et al. 1991).

Spanish priests accompanying *entradas* provided most of the available information on indigenous cultures of early Texas. The few surviving accounts of native groups in Texas reveal a dynamic cultural environment where numerous tribes passed through or inhabited Central Texas at different periods. Little is known about the majority of these tribes, but those documented around the springs at San Marcos include the Cantona, Muruam, Payaya, Sana, and Yojuane. Other tribes encountered at San Marcos included mobile hunting parties from villages in South and West Texas, such as Catequeza, Cayanaaya, Chalome, Cibolo, and Jumano, who were heading for bison hunting grounds in the Blackland Prairies (Foster 1995:265–289; Johnson and Campbell 1992; Newcomb 1993). Later groups migrated into the region, displacing the former groups or tribes. These included the Tonkawa from Oklahoma and Lipan and Comanche from the Plains (Campbell and Campbell 1985; Dunn 1911; Newcomb 1961, 1993). Archaeological sites dated to this period typically contain a mix of both European imported goods, such as metal objects and glass beads, and chipped stone tools.

Historic

Spanish settlement in Central Texas first occurred in San Antonio with the establishment of Mission San Antonio de Valero, and the later founding of San Antonio de Béxar (Bolton 1970[1915]; Habig 1977; de la Teja 1995). Most knowledge of this period is gained through the written records of the early Spanish missionaries. Between 1746 and 1755, three missions, San Francisco Xavier de Horcasitas, San Ildefonso, and Nuestra Señora de la Candelaria, were located somewhere along the San Gabriel

(known at the time as the San Xavier) River in present-day Milam County. The three missions were eventually coalesced into one, the San Xavier Mission, and moved to the San Marcos River in 1755. A petition to permanently establish a mission in Apache territory resulted in the founding of the San Sabá Mission, near present-day Menard, in 1757. Neophytes from the San Xavier Mission were transferred to the San Antonio missions and the mission property and presidio were reassigned to the San Sabá Mission. A small group of local San Xavier Indians, the Mayeyes, persuaded the missionaries to set up a new mission for them on the Guadalupe, the San Francisco Xavier Mission, but it only lasted until 1758 (Bolton 1970[1915]). The precise location of the San Francisco Xavier Mission along the San Marcos River has not yet been determined, but it has been speculated that it may have been located on the Aquarena Center peninsula (Bousman, personal communication 2004).

Besides the mission town of San Antonio, the only other Spanish settlement in the region was San Marcos de Neve, established in 1808, four miles south of present-day San Marcos. San Marcos de Neve was abandoned in 1812 as a result of constant raids by local tribes (Dobie 1932). During this time, massive depopulation occurred among Native Americans due to diseases to which indigenous people had little resistance. Those few remaining were gradually displaced to reservations beginning in the mid-1850s (Fisher 1998).

Mexico achieved independence from Spain in 1827, opening settlements in what is today South Texas. European presence increased as

settlers received land grants from the Mexican government until 1835. Settlement was difficult, however, due to raids by Native American groups. The Texas Rangers provided protection from these conflicts after Texas secured independence from Mexico in 1836. Settlement in the region increased until 1845, when Texas gained admission to the United States, resulting in the formation of Hays County in 1848 (Bousman and Nickels 2003).

Archaeological Context

Six archaeological sites are recorded within the vicinity of the proposed APE (Figure 3-1). These are 41HY37, 41HY147, 41HY160, 41HY161, 41HY165, and 41HY306. Work has been conducted off and on at these sites for a number of years (Table 3-1).

Based on the results of the SLAERP subsurface testing program and previous archaeological investigations within and adjacent to the APE, cultural materials in good contexts are undeniably present. Deposits encountered at the base of the Balcones Escarpment are in colluvial deposits with questionable contexts. However, materials in alluvial deposits, such as on the Aquarena Center peninsula and along Sink Creek are in intact contexts and are known to contain isolable components. Assemblages encountered here have dated from the Paleoindian or Early Archaic periods continuously to the Archaic and Late Prehistoric periods, and even the Protohistoric and Historic eras. They have demonstrable potential for providing high-quality data that would unquestionably contribute to a better understanding of prehistoric occupations within the project area.

FIGURE 3-1. REDACTED

Figure 3-1. Known archaeological sites in and near the project area.

Table 3-1. Previously Investigated Sites in the Spring Lake Vicinity.

Site	When Investigated	Components	Citations
41HY37	1983, 2000	Historic Burleson homestead; Late Prehistoric and Late Archaic (Late Archaic: Pedernales and Edgewood points)	Bousman and Nickels 2003; Garber and Orlof 1984
41HY147	1979, 1990, 1990	Archaic, late and early Paleoindian, Pleistocene fauna	Shiner 1983; Takac 1990, 1991a, 1991b
41HY160	1982, 1983, 1991, 1997, 1998	discrete components from Late Prehistoric through Early Archaic, domestic features	Aery 2007; Nickels and Bousman 2010.; Garber et al. 1983; Ramsey 1997
41HY161	1978, 1997, 1998	mixed Historic and Archaic, Late Archaic, late and early Paleoindian, human remains, Pleistocene fauna	Garber and Glassman 1992; Ford and Lyle 1998; Lyle et al. 2000; Shiner 1979, 1981, 1984; Stull 2009
41HY165	1984, 1996–1998	Prehistoric, Middle Archaic, bison	Gieske 1998; Ringstaff 2000
41HY306	1999	Late Archaic, late Paleoindian	Arnn and Kibler 1999

CHAPTER 4

A BRIEF HISTORY OF AQUARENA SPRINGS

Aquarena Springs resulted from the hopes and dreams of A. B. Rogers and his son, Paul Rogers. Their foray into the amusement park business began with A. B. Rogers' purchase of 125 acres of land around the headwaters of the San Marcos River in 1926. However, A. B. Rogers' interest in tourism was a lifelong one that first began with Wonder Cave and Rogers Park. The elder Rogers' initial foray into tourism and recreation began in 1911 with his purchase of land along the San Marcos River, known then as Mr. Woolfork's garden (Buckner 1962; Zimmerman 1966), which he eventually developed into Rogers Park, later known as Rogers River Resort, the "first swimming attraction in Texas" (Figure 4-1; Buckner 1962). The park became the focus

for recreation in San Marcos with swimming areas, water slides, diving boards, a bath house, cottages, and a café (Handson n.d.; Williamson 1932). Rogers' second foray into the tourism industry occurred with the purchase of Wonder Cave from Will Barber in 1916 for \$50 and a grey horse, saddle included. As the leader of San Marcos' fledging tourist industry, A. B. Rogers was soon known as "Mr. Tourist" (Buckner 1962; Wyatt and Compton 1956).

A. B. Rogers' vision of creating one of the finest resorts not only in Texas, but in the Southwest, soon became reality. Within two years of his purchase of the 125-acre parcel containing the San Marcos River headwaters, he began the

Figure 4-1. Rogers River Resort post card, dated 1923. From the collection of Jerry and Jim Kimmel.

Figure 4-2. Spring Lake Hotel ca. 1970s.

construction of a hotel and golf course. The golf course was designed by golf pro Frank Dix of the Chapultepec County Club of Mexico City, and its opening tournament was held on April 21, 1927. Once the golf course was complete, Rogers focused on the construction of the hotel and swimming pool (Figure 4-2). To make room for the 200 x 34-foot (ft) hotel, a portion of the hillside on which it was to be constructed had to be blasted. Rogers' original design placed the golf club, the hotel's lobby and café, as well as lockers for swimmers on the first floor. Thirty-four first-class rooms were placed on the second floor overlooking the lake and the 300 x 80-ft swimming pool. Despite construction delays and heavy rains, the hotel celebrated its grand opening on April 22, 1929. By the end of 1930 the resort included not only the hotel, swimming pool, and golf course, but summer cottages, camping areas, a fishing pier, a snack bar, and a rooftop garden restaurant (McGehee 1989).

While the hotel was initially successful despite the harsh economic times of the early Depression, hard times finally came to Rogers Spring Lake Park, and on February 16, 1934, the elder Rogers sold the property to a group of investors with plans to turn the hotel and park into a health resort and recuperative home. The following year, the golf course was leased to the San Marcos Golf Club, who financed and operated it through the Great Depression until 1940, when the City of San Marcos assumed the lease for \$300 a year (Brandimarte et al. 1999; McGehee 1989).

The Spring Lake Sanatorium Clinic advertised its services as a combination hotel and hospital in the June 1937 *San Marcos Record* newspaper. The health spa idea was short lived, however, and the hotel returned to the hands of the Rogers family in 1939. The following year, 1940, saw the signing of a twenty-year lease

by the Brown School, which served children with educational and emotional difficulties (Brandimarte et al. 1999; McGehee 1989).

While the hotel building was leased to the Brown School, A. B. Rogers and his son Paul continued to explore ways to provide recreational opportunities for the residents of San Marcos. In 1946, they began to use the fishing pier on Spring Lake as a boat dock. The boat tours they provided from this dock proved to be the impetus behind Spring Lake's rebirth as a tourist attraction, eventually inspiring Paul Rogers' development of the area as an amusement park. Having grown up along the banks of the San Marcos River, the younger Rogers longed to share the river's delights with visitors. Inspired by his father's tales of the glass bottom boats of Catalina Island, Rogers built a small canvass-covered row boat with a glass viewing panel along its bottom in May 1946. This creation soon led to the construction of larger vessel in 1947 that could carry up to 25 passengers (Brandimarte et al. 1999; McGehee 1989).

The success of the glass-bottom boat tours spurred Paul Rogers to visit Silver Springs,

Florida, to see their glass-bottom boat business and to learn more about their entertainment business. The following year, he convinced Marine Studios of Silver Springs, Florida, to help him set up a similar amusement park at Spring Lake, in San Marcos. Construction of a submarine theater and full-time glass-bottom boat operation began in the summer of 1950, with the grand opening of Aquarena Springs Park in October of that year (Brandimarte et al. 1999).

The idea of a submersible theater was conceived by W. Douglas Burden, founder of Marine Studios, Florida. Aquarena Springs Park's submarine theater was designed and engineered by N. C. Ebaugh of Ebaugh and Goethe, Gainesville, Florida, and fabricated in Austin by John Broad Construction and subcontractor Tips Engineering Works. This engineering and design marvel was featured the June 1952 issue of *Popular Mechanics Magazine* (Figure 4-3). According to the article, the submarine theater was 80 ft long, 7 ft wide and 14 ft deep, constructed of 100,000 lbs of steel, 140,000 lbs of concrete, and 2,000 lbs of special glass. It took 15,500 lbs of water to flood its ballast tanks enabling it to submerge to a depth of 42 inches.

Figure 4-3. Illustration from *Popular Mechanics*, June 1952.

In reality, the theater floated in the water all the time and was more like a ridged ship than a submarine. Up to 125 people were able to view aquatic performances by California sea lions, talented Aquamaids, and costumed clowns. Over the years, swimming pigs were introduced with the most memorable being Ralph, the swimming pig. Ralph gained world-wide fame in 1967 when he was featured on Walter Cronkite's CBS news program and again on *That's Incredible* in 1980 (Brandimarte et al. 1999).

In 1956, Paul Rogers began a remodeling and expansion program that included the western hillside along Spring Lake. The restaurant was remodeled, the submarine theater's seating was expanded, and the main building was doubled in size to include a gift shop, ticket office, and management offices. These buildings were preceded by the construction of Texana Shop in 1954. Additional attractions included the Swiss Sky Ride, constructed in 1963 (Figure

4-4), engineered by Fred Beigler, designed and constructed in Bern, Switzerland, by the Swiss Von Roll Company. The Franciscan Mission, Grist Mill, and the Burleson Homestead (all completed in 1964), were constructed on the western hillside. The Mission, a replica of the 1755 Franciscan mission that was established somewhere in area, was constructed by C. W. Wimberley. The Grist Mill was also constructed by C. W. Wimberley from the Rogers' former summer home on the hillside overlooking the lake, using grinding stones imported from France and grist mill machinery from the Galle family farm located 15 miles south of San Marcos. A 200-year-old noria (water wheel) was also imported from Soledad Diaz Gutierrez near San Luis Potosi in Mexico to add additional flare. As only the foundation and the fireplace of the original Burleson Homestead was left standing in the early 1960s, it was decided to reconstruct this structure with materials of the same age and time period. To this end, portions of Coke Stevenson's

Figure 4-4. The Swiss Sky Ride.

Figure 4-5. The second submarine theater just prior to removal.

boyhood home in Llano County, the Burham Home on Double Creek, Burnet County, and the 1851 Mathews house and stage stop from Hunter Road in San Marcos were used by Jack Warner in the reconstruction (Brandimarte et al. 1999).

The 1960s also saw the expiration of the Brown School's lease of the Spring Lake Hotel. Paul Rogers began immediate restorations and by June 1961, the Aquarena Springs Motor Hotel was reopened. This period of rapid expansion and growth was brought to an end by Rogers' death in 1965 (Brandimarte et al. 1999).

Don Russell, Paul Rogers' long-time friend and partner, continued on with the vision that had become Aquarena Springs, and in 1971 sold stock in Aquarena in order drum-up funds for additional improvements. The first of these, a new

submarine theater capable of seating up to 200 people with 24 six-foot windows, cost \$175,000 to \$200,000 (Figure 4-5). Next, used ferryboats were purchased from Six Flags to transport tourists from the peninsula to the hillside area. Despite these improvements, Aquarena slowly began to lose money. Don Russell retired in the mid-1970s, and the park was eventually sold in 1985 to J. Lloyd Moore and John E. Baugh, real estate investors from Houston. Unfortunately, their plans for an upscale housing development were squashed by the passing of the San Marcos River Corridor Ordinance, blocking development along the river. Much to their chagrin, they soon found themselves in the amusement park business (Brandimarte et al. 1999).

J. Lloyd Moore decided to return to Houston in 1989, and soon thereafter initiated the sale of

Aquarena to then-named Southwest Texas State University. On January 24, 1994, the purchase was finally completed, making Southwest Texas State University the steward of the headwaters of

the San Marcos River, in addition to owner of the Aquarena Springs amusement park, the Ice House building, and the adjacent dam impounding the waters of Spring Lake (Brandimarte et al. 1999).

CHAPTER 5

METHODS

Archaeologists from CAS monitored demolition and construction activities associated with the Spring Lake Aquatic Ecosystem Restoration Project. Monitoring activities focused on actions perceived to have a possible impact to subsurface areas, especially those areas previously noted to contain subsurface cultural deposits (see Figure 1-5). These activities included the installation of utility poles, perimeter fencing, and silt fencing; the location of subsurface water lines, subsequent capping of these lines, and the excavation for the installation of new lines; demolition activities (Aquarium Building, Gift Shop/Restaurant Building, the Landing and Landing Piers, the Dive Locker area and associated retaining walls, the pond/Sky Ride area, all pathways, parking lots, and curbs); auguring for cable and post installation; the removal of the submarine theaters; and tree/shrub and grass removal.

Methodology

Archaeological monitoring efforts included close on-site visual inspection of installation, excavation, and demolition activities, during which archaeologists documented and recorded any possible cultural material and/or features that may have been exposed. Observations were recorded in daily journals and by photography. Diagnostic materials were collected following the recording of their location via handheld GPS units. Feature locations were also recorded with handheld GPS units.

All artifacts and records developed over the course of monitoring activities are curated at the Center for Archaeological Studies at Texas State University-San Marcos. Curation methods meet or exceed the requirements of the THC and the Council of Texas Archeologists. All artifacts will be properly washed, analyzed, and stored. Collected artifacts will be labeled as necessary and placed in 4 mil ziplock bags along with tags containing all pertinent information. A field specimen inventory sheet will be used to record all collected artifacts. This information will then be entered in to a computerized database for inventory and analysis purposes.

Photographic logs have been established and maintained for proper identification of all photographs. Digital images are maintained in digital format on archival-quality CD with contact sheet information. Digital contact sheets will be printed on acid-free paper and placed in archival page protectors. The photo disc will be labeled with the project number/name and date, and stored in the CAS curation facility along with project records.

All field maps, notes, and forms, laboratory materials, photographs, and any written documents have been curated in a manner that complies with the standards of the THC and Council of Texas Archeologists. These materials have also been curated at CAS at TxState.

Criteria for Halting

During monitoring activities, if the CAS archaeological monitor identified a potential cultural resource, he/she advised the construction site superintendant and the USACE Contracting Officer Representative (COR). The COR then notified the operator/contractor to pause work in the immediate vicinity of the find to allow the archaeological monitor to further assess the find, document it, and collect artifacts if necessary.

If significant cultural material deposits or features were uncovered by contractors during the course of their activities, the site supervisor was notified and work in the immediate vicinity of the find was briefly paused to allow the CAS archaeological monitor additional time to fully assess the potentially significant cultural remains.

In the event that other unanticipated significant deposits were encountered during this project, CAS immediately notified the USACE, who then notified the THC and appropriate tribal cultural resources representatives. If these deposits were deemed significant under criteria established for determining SAL worthiness and NRHP eligibility, then they were avoided by project activities to the best degree possible. However, if disturbance of the deposits was unavoidable, CAS made recommendations to the USACE for possible data recovery measures to be undertaken in order to offset the loss of important cultural information that would result from the impact. Following Article XVII C(3) of the Project Management Plan, costs of such data recovery and appropriate analyses was to be borne by the USACE.

According to the MOA, if human remains were discovered during this project, CAS was required to immediately notify the USACE cultural resources personnel, who would have initiate Section 106 consultation

with the appropriate Native American tribal representatives, a process that was not to extend more than 45 days. Inadvertent discovery of human remains was treated according to State of Texas Health and Safety statutes and relevant federal guidelines. As lead federal agency for this undertaking, the USACE was responsible for the consultation coordination required under Section 106 of the National Historic Preservation Act. If remains were to be removed, removal was also to be performed in compliance with state and federal regulations. After removal, any consultation required under the Native American Graves Protection and Repatriation Act (NAGPRA) was to be initiated by CAS. Compliance with NAGPRA was to be the sole responsibility of TxState as the receiving museum of such remains. If the remains were not to be removed, any and all project activities were to avoid impacting the area(s) where burials were located.

Should the removal of one or more burials be required, every reasonable effort was to be made to remove the remains in a timely and efficient manner before weekends, holidays, or other days when project personnel were on-site. TxState was to be responsible for insuring the security of burials from vandalism or other disturbance through the employment of security personnel, fencing, and other appropriate measures as needed. All discovered remains were to be treated with respect and dignity. To this end, during removal, inventory, and transport, any human remains and associated funerary objects were to be treated carefully to avoid physical modification or breakage. Human remains could be packed in natural material separate from their associated funerary objects, but the containers were to be kept together at all times.

If avoidance and protection of remains was not possible, removal of discovered remains was to proceed according to the following provisions:

1. Remains and associated objects were to be removed carefully and immediately if possible.
2. Human Remains Inventory and Burial Context Forms were to be filled out completely.
3. Inventory of remains was to be conducted at CAS.
4. No remains or photographs of remains were to be used in public displays.
5. Detailed plan-view maps drawn to scale of remains and objects were to be made.

6. Human remains were to be packed in natural materials; no plastic or synthetic packing materials were to be used.

Representatives of the consulting Tribes were to be afforded the opportunity within a reasonable time frame to view all artifact collections and records of the project in order to identify funerary objects, objects of cultural patrimony, or sacred objects. A detailed inventory of all human remains and associated funerary objects, accompanied by maps, were to be included as part of the final report for the project.

CHAPTER 6

RESULTS

Monitoring activities focused on actions perceived to have a possible impact to subsurface areas, especial areas previously noted to contain subsurface cultural deposits (see Figure 1-2). These activities focused on installations (utility poles, perimeter fencing, and silt fence), subsurface excavations (locating subsurface water lines, subsequent capping of these lines,

the excavation for the installation of new lines, and auguring for cable and post installation), demolition activities (Aquarium Building, Gift Shop/Restaurant Building, the Landing and Landing Piers, the Dive Locker area and associated retain walls, the pond/Sky Ride area, walkways, parking lots, and curbs), removal activities (the removal of the submarine theaters and tree/shrub

Figure 6-1. Monitoring activity locations.

and grass removal) and construction activities (surface preparation for bus turn-around). All activities perceived to have a potential impact to buried cultural deposits were monitored by CAS archaeologists Carole Leezer, Fritz Hanselmann, David Yelacic, Amy Benton, Veronica Suarez, Patricia Christmas, and Jacob Hooge.

Installations Activities

Utility Pole

On October 11, 2011, the installation of a utility pole was monitored by CAS archaeologist David Yelacic. This utility pole was installed at the southern end of the peninsula between Spring Lake and Sink Creek (see Figure 6-1). This purpose of this pole was to support overhead utility lines to be connected to the construction project trailers. Two trailers serving as project headquarters were located adjacent to the installed utility pole (Figure 6-2).

Excavation of sediment for the pole installation was performed with a 20-inch auger bit. The site selected for excavation was a 24-inch-diameter area that had no asphalt on

the surface and was adjacent to the parking lot area. It appears that this was once the location of a tree, as from the surface to 4 ft below, a mixture composed mostly of woody, organic debris and soil was encountered (Figures 6-3 and 6-4). The excavation was carried out to a maximum depth of 7 ft. Below the organic material, sediments were black and clayey, with moisture increasing by depth. No cultural materials were observed.

Perimeter Fencing

Beginning on October 12, 2011, the installation of a perimeter fence around the project area was monitored by CAS archaeologist David Yelacic. The fence extended from the southern end of the peninsula behind the construction trailers, and attached to the existing fence that encloses San Marcos River Foundation equipment. The fence then extended northward along the eastern edge of the parking lot and access drive and terminated at the northern end of the peninsula adjacent to the ticket booth construction area. The fence then ran from the southwest corner of the ticket booth construction area to a black iron fence at the northern end of Spring Lake (see Figure 6-1). An access gate was placed across the drive at the northern end of the peninsula adjacent to the ticket booth construction area.

Construction of the fence included driving posts into the ground by a pneumatic hammer (Figure 6-5). No excavation was necessary for this portion of the fencing project. Installation of supporting posts for the gate, however, required excavation of sediment so that cement could be poured, providing additional strength. Excavations were dug on both sides of the drive using a rock bar (i.e., large metal

Figure 6-2. Auguring utility pole hole.

pick) and a post-hole digger with a diameter of approximately 15 centimeters (cm). Both excavations encountered asphalt and base in the top 8 inches. Beneath the modern fill, sterile black clay was observed to a depth of approximately 30 cm. Beginning at approximately 30 cm and extending to depth of approximately 45–50 cm, artifacts were encountered. The matrix below 30 cm in both excavations was black clay. In the western excavation, lithic debitage, faunal remains, and a low amount of burned rock were observed. In the eastern excavation, lithic debitage and a relatively greater amount of burned rock were observed. No diagnostic artifacts or human remains were observed.

Silt Fence

Beginning on November 23, 2011, the installation of a silt fence was monitored by CAS archaeologists Amy Benton and David Yelacic. The silt fence bordered the perimeter of the project area (see Figure 6-1). Some sections of the slit fences were installed through trenching, while other sections were placed on the surface. Trenches began along the southern perimeter of the project area, adjacent to the golf course, and were approximately 10–15 cm deep and 23–25 cm wide. No cultural material was encountered in this section. Sediments consisted of mostly construction fill, humus material and asphalt.

Trenching continued along the southwestern edge of the peninsula. Some areas, which were too small for the machine, were hand-trenched with picks and shovels. The hand-trenched areas were similar in size (10–15 cm deep and 23–25 cm wide). An abundance of cherty

Figure 6-3. Utility pole screened sediments; note wood debris.

pebbles as well as two isolated stones measuring approximately 10 cm across were observed, but the area was sterile of cultural material. When this section was completed, trenching continued

Figure 6-4. Utility pole sediments.

Figure 6-5. Installation of perimeter fence.

along the northern perimeter of the APE immediately adjacent to the construction fence line demarcating the southern end of the ticket booth construction area. The trench ran north to south from the concrete pathway along the lake edge to the main road and then traveled west about 15 meters (m). A few pieces of modern trash and chert flakes were encountered in the

encountered.

Post and Chain Fence Installation

Beginning on February 28, 2012, CAS archaeologists David Yelacic and Amy Benton began monitoring auguring activities associated with the installation of a post and chain fenceline

extending around the outer margins of Sink Creek (see Figure 6-1). To construct this fenceline, holes were excavated with a mechanical auger (Figure 6-7) starting with the southernmost post location (approximately 15 m north of the Wetland Boardwalk entrance along the project area fence). Holes were spaced 1.6 m apart, were approximately 30 cm wide, and extended approximately 110 cm below the surface. A numbering system for the holes was established and included the date and hole number, each day beginning

Figure 6-6. Silt fence installation along rock retaining wall.

with 1. The objective of this identification number was to keep track of each excavation while avoiding confusion if areas were skipped and then returned to at a later time. Excavations containing either a diagnostic artifact or three or more non-diagnostic artifacts were noted as areas of potentially significant cultural deposits.

Auger excavations along the north side of Sink Creek revealed deep, organic-rich, moist sediment, but yielded no cultural remains (Figure 6-8). The majority of these excavations were situated within 5 m of Sink Creek's current channel. Along the southern bank of Sink Creek, most of the auger excavations were very similar—deep, dark deposits devoid of cultural material—but physical characteristics of the sediment changed and cultural materials were encountered when the auger excavations proceeded onto the higher terrace near the eighth green of the golf course.

On the rise between the floodplain and the upper terrace, artifacts were observed on the surface. Cultural materials encountered on the surface included lithic debitage, fire-cracked rock, historic glass, and historic ceramics. Four auger excavations along the rise to the flat-topped terrace contained a similar artifact assemblage. Additionally, these auger excavations began to increasingly reveal a red clay loam deposit. This deposit and artifact presence was steadily encountered in nearly every auger excavation between this jog of the fenceline near the eighth green to the end of the fence at the edge of the TxState intramural athletic fields. No temporally diagnostic

Figure 6-7. Auguring for post installation.

stone tools were encountered. These data supported findings of the previous phase of work performed at this location and its designation as Archaeological Sensitive Area 3 (see Figure 1-2; Leezer et al. 2011).

Figure 6-8. Placement of augur holes along Sink Creek.

Bus Turn-Around Posts

In August 2012, CAS archaeologists David Yelacic and Patricia Christmas monitored the excavation of 13 auger holes for the placement of fencing and signage near the bus turn-around (Figure 6-9). A few burned rocks were observed in the backdirt from one auger hole, on the east side of the turn-around. No other cultural materials were observed. The last auger hole was located to the southeast of the bus turn-around on the boundary between the Aquarena Center and the Spring Lake Golf Course, near Tee Box 6. The work crew removed an existing post for a chain link fence before auguring the new hole. No cultural materials were observed in this location.

Subsurface Excavations

Water Line Location

Beginning on December 5, 2011, excavations associated with attempts to locate subsurface water lines were monitored by CAS archaeologist Jacob Hooge. The goal of these excavations was to locate and cap off all subsurface water lines coming into the project area. Excavations

occurred at the southwest corner of aquarium building, the pavement area approximately 20 ft southeast of a large cypress tree near the boat docks, the pavement area 15 ft southwest of the diver locker area, the planter next to the restaurant, and the area located between the restaurant and submarine theater. No cultural material was noted or encountered during excavations.

Additional excavations for subsurface water lines were conducted on February 9, 2012. These excavations were monitored by CAS archaeologist David Yelacic. Excavations were divided into two components, the first performed with a backhoe near where the parking lot entrances converge, and the second a manual excavation at a lift station approximately 20 m to the southeast. Excavation did not disturb intact sediments and no cultural material was observed.

On February 10, 2012, a third series of excavations associated with the uncovering of a leaking water line was monitored by CAS archaeologist Amy Benton. These excavations were located to the south of Spring Lake and southwest of the new ticket booth and restroom facility. No cultural remains were noted or encountered during excavations.

Figure 6-9. Inspection of soil from auger holes.

Utility Line Excavations

In order to install an electric line from the area near the former location of the dive locker to the former location of the pond and Morning Glory installation, electricians excavated a trench with a Ditch Witch mechanical excavator on February 22, 2012 (Figure 6-10). Excavations were monitored by CAS archaeologist David Yelacic. An electric line was

needed in this area to provide power to recharge the batteries of the glass-bottom boats docked next to the former dive locker location. The trench measured approximately 20 cm wide and extended nearly a meter below the surface.

Closer to the former location of the pond, excavated sediments were primarily gravelly fill. This sediment was the base for the pond construction. At one location, large rocks representing the “footing” of the pond were encountered. Towards the former dive locker location on the shore of Spring Lake, gravelly sediment made way to very moist black clay. This clay was a serious problem for the Ditch Witch; in fact, the machinery broke as a result of excavating through this sediment. Excavation by this method terminated approximately 30 m short of the planned terminus. No prehistoric or historic cultural materials were encountered during this phase of the project; however, many utility lines were encountered along this transect.

Excavations on this line continued on February 23, 2012, and were monitored by CAS archaeologist Veronica Suarez. A 6-inch Ditch Witch was used dig the trench. The trench line was located near the southeastern side of the lake and was a continuation of the previous excavation. Soil was dark brown to dark grey clay. A thin line of sand was visible in the trench profile at approximately 20 cm below surface. Fragments of an old water line pipe were encountered and removed. Trenching ceased when it was determined that a larger 10-inch Ditch Witch was needed. No prehistoric or historic cultural materials were encountered during this phase of the project; however, many abandoned utility lines were again encountered along this transect.

Excavations resumed on March 3, 2012, and were monitored by CAS archaeologist Veronica Suarez. The goal of these excavations was to

Figure 6-10. Excavation of electric line trench. Note moist clay in trench; glass-bottom boat dock, and former location of dive locker in background.

widen the electric line trench from 15 cm to 25 cm. Widening began on the south side of the trench, where excavated dirt was primarily construction fill. The depth of the trench ranged from 75 to 90 cm below surface. Halfway down the trench’s profile, soils became moist dark clay. No artifacts were visible. Once trenching reached the northernmost part, a second, smaller trench was excavated in order to allow a pump to drain water from the primary trench (Figure 6-11). The secondary trench reached a depth of 137 cm. A single piece of glass was found in the excavated dirt associated with this second trench.

A new addition was added to the trench, extending it to a marked orange pipe just off the lake shore. Soils encountered within this extension were dark clays. As the trench continued onto an incline, soils became dark red at approximately 48 cm below surface. Two flakes were found in the excavated dirt. Shallow

Figure 6-11. Standing water in trench.

plastic pipes were also unearthed. The backhoe eventually broke through a fiber optic line and more plastic pipes. An abandoned metal pipe was also exposed in trench.

Trench excavations encountered numerous tree roots from nearby trees. Charcoal was noted in the excavated soil. At the northernmost area of the trench, approximately 48 cm below surface, faunal bone was exposed in the wall and uncovered in excavated soil. While charcoal was uncovered in the same area as the bone fragment, no burned rock features or additional bone or artifacts were encountered. Upon further analysis, it was determined that the bone fragments were bison. A small distal tip of a projectile point was also collected from this area. The area was mapped for future reference.

The final portion of this utility line was excavated on April 9, 2012, and was monitored by CAS archaeologist Amy Benton. The trench

Figure 6-12. Trench excavations toward wetland boardwalk (in background).

continued from its previous terminus, running north to south towards an electric line post adjacent to the wetland boardwalk entrance building (Figure 6-12). The trench measured 85 cm deep and 45 cm wide, with a length of approximately 35 m. The first 60 cm consisted of construction fill. Towards the bottom of the trench, sediments consisted of very dark brown clay with non-cultural chert pebbles.

In one area of the trench, a large slab of concrete was unearthed along with some larger stones. Some of the large stones were cut into blocks. It appears that these blocks were part of the retaining wall for the above-ground pond feature that had been previously removed. The backhoe also hit two different phone/copper wire lines and an abandoned plumbing pipe. The backdirt and the exposed profiles within the trench were inspected, but no cultural material was observed.

Demolition Activities

Demolition activities conducted within the constraints of the Spring Lake Aquatic Ecosystems Restoration Project included the destruction of the Aquarium Building, the Gift Shop/Restaurant Building, the Landing and Landing Piers, the Divers' Locker area and associated retaining walls, the pond/Sky Ride area, and all pathways, parking lots, and curbs (see Figure 6-1). These demolition activities were monitored by CAS archaeologist David Yelacic, Amy Benton, Veronica Suarez, and Jacob Hooze.

Aquarium Building

Monitoring of the demolition of the aquarium building's slab foundation began on December 13, 2011, and revealed a complex construction history. It was noted during demolition activities that there were two slabs, one on top of the other, as well as multiple additions to each slab foundation. As a result of this long history of construction, much of the sediment in proximity to the foundation had been disturbed at one time or another. The trackhoe operator demolished the concrete cautiously and was careful not to excavate any underlying sediment (Figure 6-13). No cultural materials of historic or prehistoric significance were encountered.

The Landing Building and Deck Piers

Monitoring of the Landing Building demolition activities were conducted by CAS archaeologist Jacob Hooze on January 3, 2012. As with the Aquarium Building, the trackhoe operator demolished the concrete cautiously

Figure 6-13. Careful demolition of the Aquarium Building foundation.

and was careful not to excavate any underlying sediment. Upon pulling up the concrete slab of the Landing Building, at least 30 cm of construction fill was noted between the concrete and soil. Following the break up, the concrete and fill was scraped from the surface and removed with minimal impact to the soil (Figure 6-14). No cultural deposits were noted or encountered.

Following the demolition of the structure and the slab foundation, construction crews began removing the piers, which supported the building's wrap-around deck and dock. This activity was monitored by CAS archaeologist David Yelacic. Two of CAS's underwater archaeologists, Jacob Hooze and Fritz Hanselmann, were also on hand to monitor underwater portions of the removal, but due to safety concerns, were not able to get in the water. The removal process was straightforward: a chain was bound around each pier, and a trackhoe pulled the support directly out of the ground (Figure 6-15). It appeared as though the only disturbance to artifacts might have been the installation of the piers, and then their dragging across the bottom during removal.

Figure 6-14. Demolished concrete foundation of the Landing Building and exposed construction fill.

Figure 6-15. Mechanical removal of Landing Building piers.

The latter disturbance, however, would only affect the surface of the lake bottom.

The piers were constructed of planed wood, metal, and cement. The wood and metal piers extended approximately 1.2 to 1.6 m into the sediment, while the three cement pillars were only inserted 30–60 cm deep. No cultural

materials were observed in association with the sediment that was pulled out with each beam.

Walkways

The demolition of all concrete and asphalt walkways was monitored by CAS archaeologist Jacob Hooze during the first two weeks of December 2011. While the majority of the walkways connecting the various buildings present at the Aquarena Center consisted of asphalt, several areas were also constructed of concrete (e.g., the boat dock area). Upon the removal of the walkways it was noted that construction fill (usually pea gravel) underlaid the pathways and therefore very little sediment was exposed. Upon the removal of the concrete walkways next to the boat dock, a layer of dark clay loam sediment was noted. Upon further inspection, however, another concrete walkway was detected beneath this dark clay loam layer, suggesting a flooding event resulting in the deposition of sediments that were then overlaid with additional concrete.

No cultural materials were encountered during pathway demolition with the exception of the walkways in the far northern corner of the APE. Chert flakes originally noted in the backfill of the trench excavated in this location

for the silt fence installation were also noted adjacent to the demolished walkway; the asphalt walkway immediately adjacent to Spring Lake across from RSI (Figure 6-16). This location was recorded by a handheld GPS unit and entered into a map of possible cultural deposits of the area for easy relocation. No cultural materials were noted beneath the pathway in this area, as there was approximately 15–20 cm of fill.

Diver's Locker Area and Retaining Wall

Sediments underlying the diver's locker area and an associated retaining wall were examined by CAS archaeologist David Yelacic on January 23, 2012. Near the former location of the diver's locker and the boat dock, there was a rock and mortar retaining wall that transitioned between the slightly elevated turf and the asphalt walkway just above the lake level, and likely helped prevent erosion and deposition of the retained sediment into the lake. Sediment contained by the wall and underlying the diver's locker structures was examined prior to smoothing out (e.g., to reduce the slope gradient and avoid more erosion than necessary; Figure 6-17).

The exposed sediment was very gravelly black and light yellowish brown clays; it appears

Figure 6-16. Demolition of pathway in far northern section of APE, adjacent to location of noted chert deposits.

Figure 6-17. Smoothing of the slope gradient.

that much of it has previously been disturbed. Despite this aspect of the demolition project moving a relatively large amount of sediment, it did not seem to be very intrusive. Between pushing sediment into the depression where the asphalt walkway once was and scraping side-to-side, there was minimal excavation. No historic or prehistoric cultural materials were observed.

Figure 6-18. Pond wall profile exposing fill.

Pond

On January 27, 2012, the pond where the Morning Glory installation once stood was demolished under intermittent supervision of CAS archaeologist David Yelacic. As the pond was elevated above the adjacent surface and underlain by an enormous amount of gravelly fill, no impact to subsurface deposits were anticipated, nor did they occur. During demolition it was noted that the base of the pond was supported by this gravelly fill to an unknown depth (Figure 6-18).

Gifts Shop and Restaurant Building

During the first week of February 2012, the demolition and removal of the concrete slab foundation for the Gift Shop and Restaurant Building was intermittently monitored by CAS archaeologist David Yelacic. The foundation of these buildings included a set of cavities beneath the surface of the foundation. The horizontal extent of these voids was not clear, and their depth was approximately 50 cm. The depth of the features was obscured by standing water and piles of debris that collapsed into

place. They contained utility lines but did not appear to serve any other function. Additionally, no entrance point to the cavities was observed. Upon removal of these cavities and concrete foundation sediment was encountered that was mottled reddish brown and black gravelly clays; displaying evidence of previous disturbance (Figure 6-19). This sediment was likely brought in for construction of the former buildings. No historic or prehistoric cultural remains were observed.

Parking Lot and Curbs

During the last week of January and the first week of February 2012, the parking lot

Figure 6-19. Exposure of previously disturbed sediments.

and curbs of the Aquarena Center Complex were removed (Figure 6-20). These demolition activities were monitored by CAS archaeologists David Yelacic, Amy Benton, and Veronica Suarez. This activity was accomplished in a careful manner in which construction crews were able to remove only the exposed asphalt and concrete curbs, revealing gravelly road base beneath. Despite the fact that the top portion of this exposed road base was also removed, no natural sediments were impacted during this removal process. Following the removal of adjacent areas of grass, the whole area was covered by topsoil to a depth of approximately 15–20 cm. No cultural remains were noted or encountered during the removal of the parking lot and associated curbs.

Removal Activities

Submarine Theater

Prior to the removal of the submarine theater, the bank area behind the larger submarine theater and the floor of the performance arena in front of the submarine were subject to visual inspection and photo documentation (Figure 6-21). These documents were used in comparison to the visual inspection and photo documentation of the bank and floor area following removal to note any impacts to the cultural deposits in the area. Visual inspections and photo documentation was conducted by CAS

Figure 6-20. Removal of parking lot and associated curbs.

Figure 6-21. Bank area behind submarine theatre prior to removal.

underwater archaeologists Fritz Hanselmann and Jacob Hooge.

CAS was notified that geotechnical boring would be taking place in advance of constructing the crane that was eventually used to remove both submarine theaters. A single bore hole was examined at the southwest edge of the crane pad footprint on the dry land (Figure 6-22) and

Figure 6-22. Overview of boring location, facing north.

recorded with a Trimble GeoXT hand held GPS unit. The bore hole presented a good opportunity to see deep deposits in the terrestrial portion of the project area. The boring crew removed samples approximately every 61 cm, examined bulk density, and bagged the samples for more

extensive lab analyses. CAS geoarchaeologist David Yelacic had the opportunity to very briefly examine each sample for color, texture, and to provide a quick description (Table 6-1).

Two large mobile cranes were originally configured to lift the two submarine theaters, the older “boxcar” submarine theater submerged and abandoned at the end of the glass-bottom boat dock and the newer, visible submarine theater. Apparently, the weight of the visible submarine theater was too much for the two mobile cranes to lift out of the water, and a strap broke during an attempted lift. It was decided that a larger “super crane” (one of the largest in the world) with a, 1,800-ton lift capacity would be used. This lift was successful, and both submarine theaters were eventually removed from the

Table 6-1. Geotechnical Boring Core Descriptions.

Label	Depth (ft bs)	Description
B1	0–2	Gravelly clay, 10YR 3/1 (subround to round, <1 cm diameter – PEA GRAVEL)
	2–4	Gravelly clay, 10YR 3/1, increased amount of gravels (same gravels as above)
	4–6	Gravelly clay, 10YR 3/1, diminished amount of gravels (subangular to subround, <1 cm diameter), snail shells
	6–8	Clay, 10YR 3/2, 1% gravel (subround, <2 cm diameter)
	STRAT BREAK	
	8–10	Clay, 7.5YR 4/6, Mn concretions (<1 cm) and coats, CaCO ₃ nodules (<1 cm), 1-3% snail shell fragments
	13.5–15	Clay and coarse sand, 5YR 5/6, same Mn and CaCO ₃ as above, <1% snail shells
	18.5–20	Mixed-not mottled, but catching a stratigraphic break: upper) clay loam, 10YR 3/1; lower) very gravelly clay, 10YR 4/6, >50% gravel (subangular to subround, <2 cm diameter)
	20–21.5	Extremely gravelly loam, 10YR 6/6, >80% gravel (same gravel as above)
	23.5–25	Loamy (too wet to accurately describe), 10YR 3/3, clean—no gravels or shells, 1% coarse sand

water (Figure 6-23 and 6-24). Both removals were monitored by CAS archaeologist Carole Leezer.

Following the removal of the submarine theater from Spring Lake, it was placed on the adjacent dry point where it was demolished. This dry point is the former location of the dive locker and the glass-bottom boat dock. Crews used trackhoes and cranes, as well as many other tools to dismantle the submersible theaters. Driving and using these very heavy machines, however, caused considerable impact to sediments; as deep as 40 cm in some locations (Figure 6-25). For this reason, a very brief archaeological reconnaissance of the area was required. Unfortunately, the nature of the project—dismantling large architectural pieces and moving the dismantled parts around—severely obscured the disturbed sediments. The affected area was apparently disturbed. The sediment was a mixture of natural deposits and architectural debris, but no significant prehistoric or historic cultural resources were observed.

Shortly following the removal of the both submarine theaters, a boom, which had been installed to protect Spring Lake's critical habitat during the removal of both subs, was removed. This allowed divers to enter the water and assess the area for impacts to the sensitive cultural

resources located in the areas of the submarine theaters.

While no impact was caused by the removal of either submarine theater (Figure 6-26), it was noted that an impact to a submerged terrestrial bank had occurred in the past when the smaller, older submarine theater was abandoned (Figure 6-27). It was noted that an exposed profile of this impacted submerged terrestrial bank had been exposed by the removal of the smaller sub. This

Figure 6-23. Removal of smaller, older submerged submarine theater.

Figure 6-24. The larger, newer submarine theater being removed.

Figure 6-25. Overview of project area, facing northeast.

Figure 6-26. Exposed gravel area where larger submarine theater rested.

location was mapped to be revisited in the near future to assess the impact and the potential for exposed cultural resources.

Trees, Shrubs, and Grass

All large trees selected for removal during the restoration project were cut down and their

stumps ground until even with the ground surface so as to not cause any disturbance to subsurface deposits. One tree however, was removed, and the sediment from which it was removed was subject to inspection on December 19, 2012, by CAS archaeologist David Yelacic. This tree was located on the south side of the diver's locker buildings, adjacent to a rock retaining wall and asphalt walkway. Sediments exposed as a result of the tree removal were gravelly black and light yellowish-brown clays. The sediment was characteristic of soil that was previously brought to the location as fill. No cultural material was noted or encountered during this examination.

As the current grass species found on the peninsula was considered to be a non-local invasive variant, the entire APE was slated for grass removal. This removal consisted of the careful scraping of the top surface to a depth of no more than 15–20 cm in order to limit impacts to subsurface cultural deposits. Grass removal was

intermittently monitored by CAS archaeologists Carole Leezer, David Yelacic, Amy Benton, and Veronica Suarez during the first weeks of February 2012. Grass removal began with the scraping of vegetation in an approximate 7.5-m radius around standing trees with the blade of

a standard-sized backhoe. Once the top layer of soil and grass was removed, the area was raked by hand (Figure 6-28).

Stripping of the surface to a maximum depth 20 cm below surface continued across the APE, in order to remove all present grass by the roots. Scraping began in the southern portion of the project area, between the parking lots and the golf course. In some places, gravelly fill was found beneath the turf in this location of the peninsula, but most of the exposed surface was topsoil. A very small number of fire-cracked rocks was observed. These rocks exhibited no patterning and ranged in size, not exceeding 15 cm in diameter. One small piece of heat-fractured chert was observed in this area, and one possible hammerstone was also collected. These potential artifacts were moved from their in situ context during the scrapping process. A cluster of charcoal was also observed extending into deposits not disturbed by stripping of the surface. Brief examination of the charcoal cluster revealed oriented wood fragments, indicating that it was likely a burned tree.

Golf balls were common among the stripped sediment, and in many cases, they were observed at a maximum depth of approximately 15 cm below surface. The presence of these golf balls below the surface suggested that portions of this landscape had been very dynamic. Small depressions on the landscape could have easily been filled by available sediment (e.g., on the margins of golf cart paths, etc.) during even mild precipitation events.

Figure 6-27. Exposed profile of impacted submerged terrestrial bank.

Figure 6-28. Area around trees subject to hand raking.

During the monitoring of the grass removal in the southern portion of the project area, a large stone was uncovered approximately 30 m

Figure 6-29. Overview of noted rock cluster.

Figure 6-30. Exposed fire-cracked rock.

southwest of the diver's locker structures. Upon further clearing of this area, additional larger stones were encountered. The largest stone was slightly larger than a basketball and flat on top. Other stones varied in size ranging from 8 to 20 cm across. The "fill" around these stones was slightly different than in other areas nearby. This anomaly was considered to be some type of cultural feature and its location was recorded

with a handheld GPS. The area was then marked with stakes and flagging tape so that workers could avoid the area. No additional impacts to this area were made. A layer of approximately 15–20 cm of topsoil. was placed on top of this area.

Stripping of the surface at the northeast end of the project, in the pecan grove area adjacent to the new ticket booth construction site, yielded slightly different results. For the most part, much of the newly exposed surface was similar to the south end of the project area; that is, topsoil. and patches of gravelly fill were exposed. In one area, however, approximately 20 m south of the field school excavation block, there was a cluster of burned rock.

The cluster of burned rock was situated in a gravelly black clay matrix (Figure 6-29). This gravelly matrix is considerably different from nearby gravel fills in both gravel content and matrix properties. Cobbles range in size but do not exceed approximately 20 cm in diameter. The extent of the cluster was approximately 2 x 4 m, and these rocks were exposed at about 5 cm below the surface. At least half of the rocks are clearly burned, but no other artifacts or charcoal were observed with this cluster. While no cultural artifacts were detected in the surface of this feature, the feature itself was considered to

be a cultural manifestation. Its location was recorded by a handheld GPS to allow for locating this feature in the future. This feature was not impacted (beyond exposure of the upper portion) during stripping and was later capped by a imported layer of 15–20 cm of topsoil..

Construction Activities

Bus Turn-Around Area

Once the parking lots, associated curbs, and grass surfaces were removed, construction crews focused on surface preparation associated

the construction of a bus turn-around. This activity consisted of the removal of the medians between the parking lot areas and the placement of appropriate gravel fill for the turn-around road base. During the removal of the medians, a cluster of burned rocks was identified (Figure 6-30). As this was considered to be a cultural feature its location was recorded with a handheld GPS unit to facilitate future location. The area was not subject to additional impact, but chert flakes, burned rocks, a tested coble and burned clay were noted on the surface following stripping. The area was then quickly covered by road base material for the proposed bus turn-around.

CHAPTER 7

DISCUSSION AND CONCLUSIONS

An archaeological testing and cultural resources survey for the Spring Lake Section 206 Aquatic Ecosystem Restoration Project was conducted in accordance with the MOA signed by the USACE, THC, and TxState. This MOA called for an archaeological assessment of the APE to determine the extent of intact cultural deposits within the project area. An investigative program was developed and implemented by CAS that included both terrestrial and underwater investigations. Terrestrial investigations consisted of pedestrian survey, shovel test excavation, test unit excavation, auger pit excavation, and backhoe trench excavation. Underwater investigations included reconnaissance survey, test unit excavation and the extraction of sediment cores.

Four archaeological sites, 41HY160, 41HY165, 41HY161, and 41HY147, have been previously recorded within the project area; however, none of these sites were completely surveyed when they were recorded, and as a result the boundaries of all sites within the APE were poorly and imprecisely known. Therefore, it was recognized that there was a high probability that ground-disturbing activities would encounter additional, yet-unknown cultural resources at or just below the surface that may appear to be outside the previously charted boundaries of any particular site. As a result of the testing and survey investigations, the boundaries of these archaeological sites were expanded and Archaeologically Sensitive Areas (ASAs) were identified within these expanded boundaries.

Based on the testing and survey results presented in *Results of Cultural Resources Survey for the Spring Lake Section 206 Aquatic Ecosystem Restoration Project, Texas State University-San Marcos, Hays County, Texas* (Leezer et al. 2011) intact cultural resources were clearly present across parts of the APE, and these deposits had the potential to be impacted by the proposed undertaking. With these results in mind, CAS recommended the development of mitigative measures to offset the loss of important cultural information. Mitigative measures proposed for the Spring Lake Aquatic Ecosystem Restoration Project were presented in the *Historic Properties Treatment Plan for the Spring Lake Section 206 Aquatic Ecosystem Restoration Project* (Leezer and Lohse 2011) and included archaeological monitoring, the results of which are presented within this report. Additional mitigative efforts included the modification of demolition specifications for depth of removal to minimize impacts to subsurface deposits, and the development of existing archaeological data concerning archaeological sites 41HY147 and 41HY165.

During the archaeological monitoring of activities associated with the demolition and construction portions of the SLAERP, no intact, significant archaeological deposits were encountered or impacted. However, several areas of potential archaeological deposits were encountered. These locations were photographed and described and their locations mapped with a Trimble GEOxT handheld GPS unit and plotted

on a map of potential archaeological deposits of the Spring Lake peninsula to be referenced for future use (Figure 7-1).

In conclusion, it is evident from the results of the testing and survey project in addition to the archaeological monitoring project that Spring Lake and the Spring Lake peninsula are locations of significant, intact archaeological deposits representing over 12,000 years of human occupation. While the generation of maps depicting ASAs within the project area as well as

the locations of potential archaeological deposits encountered during monitoring can be referenced for future development of the area, it is evident that the entire APE has the potential to possess archaeological deposits. With this in mind, CAS recommends that the area be avoided in the case of future development. If complete avoidance is not possible, CAS recommends that mitigative efforts in the form of data recovery precede any and all further subsurface impacts on the peninsula or beneath the surface the Spring Lake lake bed.

FIGURE

Figure 7-1. Map of potential archaeological deposits encountered during monitoring activities.

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APPENDIX A

MEMORANDUM OF AGREEMENT

REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P.O. BOX 17300, 819 TAYLOR STREET
FORT WORTH, TEXAS 76102-0300

June 23, 2009

Planning, Environmental and Regulatory Division

SUBJECT: Memorandum of Agreement for the Spring Lake Section 206 Aquatic Ecosystem Restoration Project, San Marcos, TX

Mr. Pat Fogarty
Texas State University-San Marcos
601 University Drive
San Marcos, Texas 78666

Dear Mr. Fogarty:

Attached is Memorandum of Agreement for the Spring Lake Section 206 Aquatic Ecosystem Restoration Project, San Marcos, TX for your signature. After signing, please return all copies via registered mail to Corps of Engineers, ATTN: Ann Chancey (RM 3A14), 819 Taylor Street, Fort Worth, Texas 76102-0300.

Once we have received your signed copies, the MOA will be sent to the concurring parties for signature. Upon signature of all parties, the Corps will distribute an original signed copy to each party and one will be filed with the Advisory Council on Historic Preservation.

If you have any questions concerning this project, please feel free to contact Ms. Ann Chancey at (817) 886-1719.

Sincerely,

William Fickel, Jr.
Chief, Planning, Environmental
and Regulatory Division

Enclosures
8 Copies of Memorandum
Of Agreement

MEMORANDUM OF AGREEMENT BETWEEN
THE US ARMY CORPS OF ENGINEERS,
TEXAS STATE UNIVERSITY SAN MARCOS
AND
THE TEXAS HISTORICAL COMMISSION,
REGARDING THE SPRING LAKE SECTION 206 AQUATIC ECOSYSTEM
RESTORATION PROJECT, SAN MARCOS, TEXAS

April 29, 2009

WHEREAS, the US Army Corps of Engineers, Fort Worth District (COE) is the lead agency for this project, the non-Federal, Local Sponsor, Texas State University (TxSt) San Marcos, has expressed their desire to act as a participatory agency in this restoration project located in south-central Texas, within the city limits of San Marcos on the Texas State University campus, a project that includes the Aquarena Center, Spring Lake, and the TxSt golf course; and

WHEREAS, the Spring Lake Section 206 Aquatic Ecosystem Restoration project (henceforth known as the Undertaking) addresses the need to restore the aquatic ecosystem components of Spring Lake and riparian corridor/grassland habitat located directly adjacent to the lake to a more natural condition within the constraints of existing land uses, as recommended in the Final Integrated Detailed Project Report and Environmental Assessment, Spring Lake Section 206 Aquatic Ecosystem Restoration Project, US Army Engineer District (USAED) Fort Worth, August 2006; and

WHEREAS, the National Ecosystem Restoration (NER) or recommended restoration plan includes removal of existing structures and facilities at the Aquarena Center, removal of all submerged structures, restoration of valuable aquatic and terrestrial habitats throughout the Spring Lake peninsula, removal of exotics, creation of a vegetated buffer zone between the golf course and Spring Lake, and construction of new and rehabilitated trails, traffic control gates, fencing, a rest room facility, picnic tables, benches and signage; and

WHEREAS, all other construction activities not specifically listed herein are separate undertakings and are therefore not part of this agreement; and

WHEREAS, the COE with the concurrence of the Texas State Historic Preservation Officer (TSHPO hereafter SHPO) at the Texas Historical Commission (THC), has determined the Area of Potential Effect (APE) to be ten acres of floodplain habitat on the Aquarena Center peninsula, nine acres of riparian corridor habitat along the shoreline of Spring Lake, and 22 acres of lacustrine habitat within the headwaters of the San Marcos River; and

WHEREAS, the COE, and the THC has determined that the Undertaking will have an adverse effect upon known and unknown properties included in or eligible for inclusion in the National Register of Historic Places (NRHP); and

April 29, 2009 FINAL

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WHEREAS, a historic structures assessment has determined historic structures located on Spring Lake are not eligible for inclusion in the NRHP; and

WHEREAS, the COE will consult with the THC and the Advisory Council on Historic Preservation (Council), pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act of 1966, as amended; and

WHEREAS, the THC is authorized to enter into this Memorandum of Agreement (MOA) in order to fulfill its role of advising and assisting federal agencies in carrying out their Section 106 responsibilities pursuant to Sections 101 and 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800.2 (1)(i) and 800.6 (b); and

WHEREAS, the COE, pursuant to 36 CFR Part 800.6(a)(1), has invited the Council to participate in this consultation and the Council has chosen not participate; and

WHEREAS, the COE, the THC, and TxSt have participated in consultation for this Undertaking and now have been invited to be signatories to this MOA; and

WHEREAS, the Comanche Nation, the Kiowa Tribe of Oklahoma, the Mescalero Apache Tribe, and the Tonkawa Tribe of Oklahoma have been invited to participate in consultation to seek ways to avoid, reduce or mitigate adverse effects as the result of this undertaking and to concur in this agreement; and

WHEREAS, TxSt has determined that this MOA serves a public purpose by providing a means for it to meet its responsibilities under the NHPA in conjunction with the Aquatic Ecosystem Restoration Project,

NOW, THEREFORE; COE, the THC, and TxSt agree that the consultation process for the Undertaking shall be carried out under this MOA in accordance with the following stipulations to satisfy Section 106 responsibilities.

Stipulations

COE will coordinate all Section 106 consultation for the Spring Lake Section 206 Aquatic Ecosystem Restoration Project.

TxSt will provide all fieldwork and personnel associated with the cultural resources investigations, excavation, curation, monitoring, and reporting as per this MOA in conjunction with the Spring Lake Section 206 Aquatic Ecosystem Restoration Project. TxSt, through coordination with the COE, will ensure that the following measures are carried out:

STIPULATION 1
Project Design

Four cultural resource sites, 41HY160, 41HY165, 41HY161, 41HY147 are known to occur within the project area. There is also the potential that ground disturbing activities will encounter additional or unknown cultural resources very near or below the surface. TxSt shall ensure that the Spring Lake Section 206 Aquatic Ecosystem Restoration Project will avoid or minimize impacts to cultural resources within the APE by developing a Historic Property Treatment Plan (HPTP). The plan will include five sub-sections and be subject to the review and acceptance of the COE Cultural Resources office: 1) a subsurface testing program to determine the extent of intact cultural deposits within the project area; 2) development of measures to coordinate closely with the project design team and convey cultural resource information to assure avoidance of historic properties during specific design phases of the project; 3) development and implementation of an excavation plan prior to construction; 4) development and implementation of an archaeological monitoring program to monitor all ground disturbing activities during the construction and restoration phases of the project; and 5) a treatment plan to address adverse effects to cultural resources and unanticipated discoveries.

STIPULATION 2
Development and Implementation of an Historic Properties Treatment Plan

TxSt will implement a testing program that will be performed to determine whether significant portions of sites 41HY160, 41HY165, 41HY161, and 41HY147 might be adversely affected by specific proposed developments. All of these sites have been previously determined eligible to the NRHP and are Texas State Archaeological Landmarks. This testing program will also determine if additional unknown cultural resources exist within the project area. The Archaeological testing portion of the plan shall specify at a minimum:

- (1) The property, properties, or portions of properties that are to be investigated;
- (2) The level of effort to be invested in each site;
- (3) The field methods that will be used to investigate and assess subsurface features;
- (4) The fieldwork and analytical methods to be used;

TxSt will develop methods to be used in project coordination and dissemination of information and data to the Spring Lake Section 206 Aquatic Ecosystem Restoration project design team at predetermined design phases including, but not limited to:

- (1) Provide personnel contact information to COE program, environmental and project managers, and COE contractors during all necessary project phases, i.e. design review, preconstruction and construction/restoration;
- (2) Develop a Cultural Resource schedule if necessary;

TxSt will develop methods that meet COE approval to be used in implementing an archaeological monitoring program during ground disturbing activities of the project construction and restoration activities, to include but not limited to;

- (1) Flagging or buffering around known cultural resources to be avoided during demolition/construction/restoration activities;
- (2) Daily journals shall be used to document monitoring activities including photographs if determined necessary;

TxSt shall ensure that the HPTP includes measures developed to address adverse effects on archaeological resources, including, but not limited to data recovery;

- (1) Coordinate excavation and archaeological field work around construction progress of the project area;
- (2) Identify site(s) that will be subject to data recovery to mitigate damages;
- (3) The approximate locations of excavation units, methods of sampling, (i.e., sample size and rationale for specific sample unit selection);
- (4) Research questions and goals that are applicable to the Project area and which can be addressed through data recovery and archival studies, along with an explanation of their relevance and importance;
- (5) The proposed disposition of recovered materials and records;
- (6) A proposed schedule for the submittal of preliminary, draft and final reports to the COE;
- (7) Qualifications of management and field supervisory personnel;
- (8) A list of project-specific permits that have been secured and those that are pending;

The Plan shall be reviewed and revised in accordance with Stipulation 4. The results of the field work will be presented in a professional quality report to include all the information collected during archaeological testing and archaeological monitoring. These data will be used to contribute to Spring Lake 206 Aquatic Ecosystem Restoration Project design.

STIPULATION 3 Authorization of Construction

Once this MOA has been fully executed the Undertaking may proceed and construction work may occur in areas of the APE that are not within the boundaries of the historic properties relevant to this agreement. To prevent impacts to historic properties TxSt will ensure that all construction maintains a buffer, as developed in the HTPT and directed by the onsite archaeologist, around all sites in accordance with this MOA, the COE and THC. As per the HPTP, TxSt will ensure that a report is prepared upon completion of the project.

STIPULATION 4

Permits

TxSt shall ensure that, to the extent that any archaeological activities carried out under this Agreement require the excavation or removal of an archeological resource that is subject to the Texas Archaeological permitting requirements that such activities shall be conducted in accordance with a permit issued by the state pursuant to its authority. Any such permit shall be referenced in the final reports. TxSt shall also ensure that the contractor acquires any other permits needed to complete the terms of this agreement.

STIPULATION 5

Treatment Plan and Report Review

TxSt shall submit the treatment plans and draft technical report(s) resulting from stipulation 2 to COE. The COE will distribute copies to THC and Concurring Party(ies) for review and comment. The reviewers shall have thirty (30) calendar days from receipt of the treatment plans and draft report to respond to COE with comments. Failure to respond by any party within the 30-day comment period shall not prohibit TxSt from finalizing the report. TxSt will ensure that the Treatment Plans and technical report(s) are finalized to address the comments of reviewers.

STIPULATION 6

Discovery of Unknown Cultural Resources

TxSt shall immediately notify the COE who will notify the THC and appropriate tribal cultural resources representatives if previously unknown cultural deposits are discovered during construction or restoration activities. TxSt will notify the COE who will notify appropriate Native American tribal representatives in the event that human remains or burials are encountered. Inadvertent discovery of human remains shall be treated according to State of Texas or relevant Federal guidelines. Human remains shall be analyzed to determine affiliation. TxSt shall act, and burials will be treated, in a manner that is consistent with Texas jurisdiction as applicable. TxSt will ensure that an appropriate treatment is implemented by incorporating provisions into the HPTP.

STIPULATION 7

Curation

TxSt shall ensure that all materials and records resulting from the implementation of this Agreement are curated in accordance with Texas Historical Commission Rules of Management and Care of Artifacts and Collections (TxSt has THC agreed curation facility), except where an alternative plan for disposition of human remains is developed in the HPTP.

STIPULATION 8
Confidentiality

Consistent with Section 304 of the NHPA (16 USC Part 470w-3), the nature and location of archaeological sites discussed in this MOA shall be maintained as confidential, on a "need to know" basis, limited to staff and agents of TxSt, COE, THC, appropriate Tribes involved in planning and reviewing the Undertaking, and qualified researchers.

STIPULATION 9
Archaeological Report Dissemination

TxSt will ensure all final archaeological reports resulting from actions pursuant to this Agreement are provided to the COE. COE will disseminate reports to THC and Concurring Party(ies).

STIPULATION 10
Professional Qualifications

Pursuant to Section 112 of the NHPA (16 USC Part 470h-4), TxSt shall ensure all historic preservation work carried out pursuant to this Agreement is carried out by, or under the supervision of a person or persons, meeting the *Secretary of the Interior's Professional Qualifications Standards* (48 FR 44738-44739).

STIPULATION 11
Equal Opportunity/Non-Discrimination

The Parties agree to comply with all applicable federal or state laws relating to equal opportunity and non-discrimination.

STIPULATION 12
Non-Availability of Funds

This Agreement shall be subject to available funding, and nothing in this Agreement shall bind the State to expenditures in excess of funds authorized and appropriated for the purposes outlined in this Agreement. The Project Partnership Agreement (PPA) between the COE and TxSt will outline overall project cost sharing between the two entities. The PPA will also outline the amount of financial work-in-kind credit that TxSt will receive for cultural resource tasks, which are conducted following execution of the PPA.

In accordance with 31 USC Part 1341, 41 USC Part 11, and other applicable federal laws, COE's liabilities and obligations under this Agreement are contingent upon the availability of funds from which payment can be lawfully made. Nothing in the Agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies.

STIPULATION 13
Dispute Resolution

Should any Signatory and/or Concurring Party to this Agreement object within thirty (30) days to any actions proposed or carried out pursuant to this Agreement, COE shall consult with the Signatory parties and/or Concurring Party(ies) to resolve the objections. COE shall notify THC of any such objection. If COE determines that the objection cannot be resolved with THC, COE shall forward all documentation relevant to the dispute to the Council for their assistance in resolving the dispute. The COE and Signatory parties will consider any recommendation or comment provided by the Council pertaining to the subject of the dispute. The COE's responsibility to carry out all actions under this Agreement that are not the subject of the dispute will remain unchanged.

STIPULATION 14
Record Retention

All books, accounts, reports, files and other records of THC, and any technical reports and project files relating to this Agreement which are determined releasable under the Freedom of Information Act (FOIA), shall be subject at all reasonable times to inspection and audit by the State for five years after the termination of this Agreement.

STIPULATION 15
Amendment of this Agreement

TxSt, COE, or THC may request that the MOA be amended according to 36 CFR Part 800.6(c)(7). Any amendment will be effective on the date an amended agreement is signed by all Signatories. COE will ensure a copy of any executed amended agreement is filed with the Council.

STIPULATION 16
Termination

In the event the Parties determine the terms of the MOA cannot be or are not being carried out, the Parties shall consult to seek amendment of the Agreement. If the Agreement is not amended, the Parties may terminate it pursuant to 36 CFR Part 800.6(c)(8). COE will either execute a memorandum of agreement under 36 CFR Part 800.6(c)(1) or request the comments of the Council pursuant to 36 CFR Part 800.7(a).

STIPULATION 17
Duration

This Agreement shall be considered null and void if its terms are not carried out within ten (10) years from the date of its execution, unless the Signatories agree in writing to an extension for carrying out its terms.

STIPULATION 18

Miscellaneous

1. The Parties agree that nothing in this Agreement shall constitute or otherwise be construed as a waiver of sovereign immunity by COE or TxSt.
2. The Parties agree that, except as otherwise provide herein, this Agreement shall be governed by and interpreted in accordance with applicable federal law.
3. The Parties agree that all terms and conditions of this Agreement are expressly contained herein.

IN WITNESS WHEREOF, execution of this MOA by COE, TxSt, and THC, and implementation of its terms, evidence that COE have taken into account the effects of the Undertaking on historic properties and acknowledge that the COE responsibilities will be completed when it files a signed copy of the final MOA with the ACHP. See 36 CFR Part 800.6(b)(1)(iv).

US ARMY CORPS OF ENGINEERS, FORT WORTH DISTRICT

BY: ORENSTEIN, LTC DATE: 13 May 09
Name: CHRISTOPHER W. MARTIN
Title: Colonel, Corps of Engineers, District Commander *Acting*

TEXAS HISTORICAL COMMISSION

BY: DATE: 6/16/09
Name:
Title: State Historic Preservation Officer

TEXAS STATE UNIVERSITY, SAN MARCOS

BY: _____ DATE: _____
Name:
Title:

CONCURRING PARTIES

COMANCHE NATION

By: _____ DATE: _____

Name:

Title:

KIOWA TRIBE OF OKLAHOMA

BY: _____ DATE: _____

Name:

Title:

MESCALERO APACHE TRIBE

By: _____ DATE: _____

Name:

Title:

TONKAWA TRIBE OF OKLAHOMA

BY: _____ DATE: _____

Name:

Title: