CULTURAL RESOURCES CONSTRAINTS ANALYSIS FOR THE DRY BERTHING OF THE BATTLESHIP *TEXAS*, SAN JACINTO BATTLEGROUND STATE HISTORIC SITE, HARRIS COUNTY, TEXAS

Prepared for

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INTRODUCTION

On behalf of the Texas Parks and Wildlife Department (TPWD) c/o AECOM, SWCA Environmental Consultants conducted a cultural resources constraints analysis for the proposed dry berthing of the Battleship *Texas*, National Historic Landmark. The Battleship *Texas* is also known as the *USS Texas*, BB35 and archaeological site number 41HR744. The proposed project is situated within the San Jacinto Battleground State Historic Site (41HR277) in southeast Harris County. The purpose of this constraints analysis is to gather available information on previously recorded archaeological surveys, archaeological sites, and historic resources within the project area and to assess the potential for the undertaking to impact significant cultural resources. The goal is to provide information for project planning and development, as well as estimates on possible future work that may be required for regulatory compliance.

This report documents the results of the cultural resources background review and an assessment of possible historic property and archaeological site locations. An archaeological survey of the project area was not conducted as an element of this research. This constraints analysis does not constitute any form of archaeological clearance for the project area, but may be used to coordinate future cultural resource compliance with state and/or federal agencies.

DEFINITION OF STUDY AREA

The area of potential effect (APE) for the proposed project includes the berth for the Battleship *Texas*, a corridor surrounding the berth, and a corridor along the shoreline to the south of the berth (Figure 1). The project area is contained within the San Jacinto Battleground State Historic Site (41HR277) and it is located on the Highlands, Texas USGS 7.5-minute topographic quadrangle map. The proposed project encompasses approximately 9 acres.

The Battleship *Texas* was originally parked in its berth at the San Jacinto Battleground in 1948. Major repairs to the ship and modifications of the berthing area were conducted in 1988 through 1990. The current project involves one of four proposed designs for the dry berthing of the ship at the site. Each of these plans would involve extensive modifications of the berthing area. The primary public access point for the ship would be relocated to the north side of the berth – the opposite of the current arrangement. All of the existing buildings located on the south (the battleground side) of the berth would be demolished (TPWD 2008).

REGULATORY FRAMEWORK

Projects in Texas can come under the purview of two primary cultural resource regulations, the National Historic Preservation Act of 1966 (NHPA) and the Antiquities Code of Texas. Both are administered by the Texas Historical Commission (THC) located in Austin. If an undertaking is federally permitted, licensed, funded, or partially funded, the project must comply with Section 106 of the NHPA, as amended. Section 106 requires that every federal agency consider the undertaking's effects on historic properties. Examples of projects in Texas requiring compliance with the NHPA include those conducted on federal lands or ones acquiring a federal permit such as a Section 404 permit from the United States Army Corps of Engineers.

Historic and prehistoric cultural resource sites that are located on lands owned or controlled by the State of Texas or one of its political subdivisions are protected by the Antiquities Code of Texas (Code). The Code requires state agencies and political subdivisions of the state, including cities, counties, river

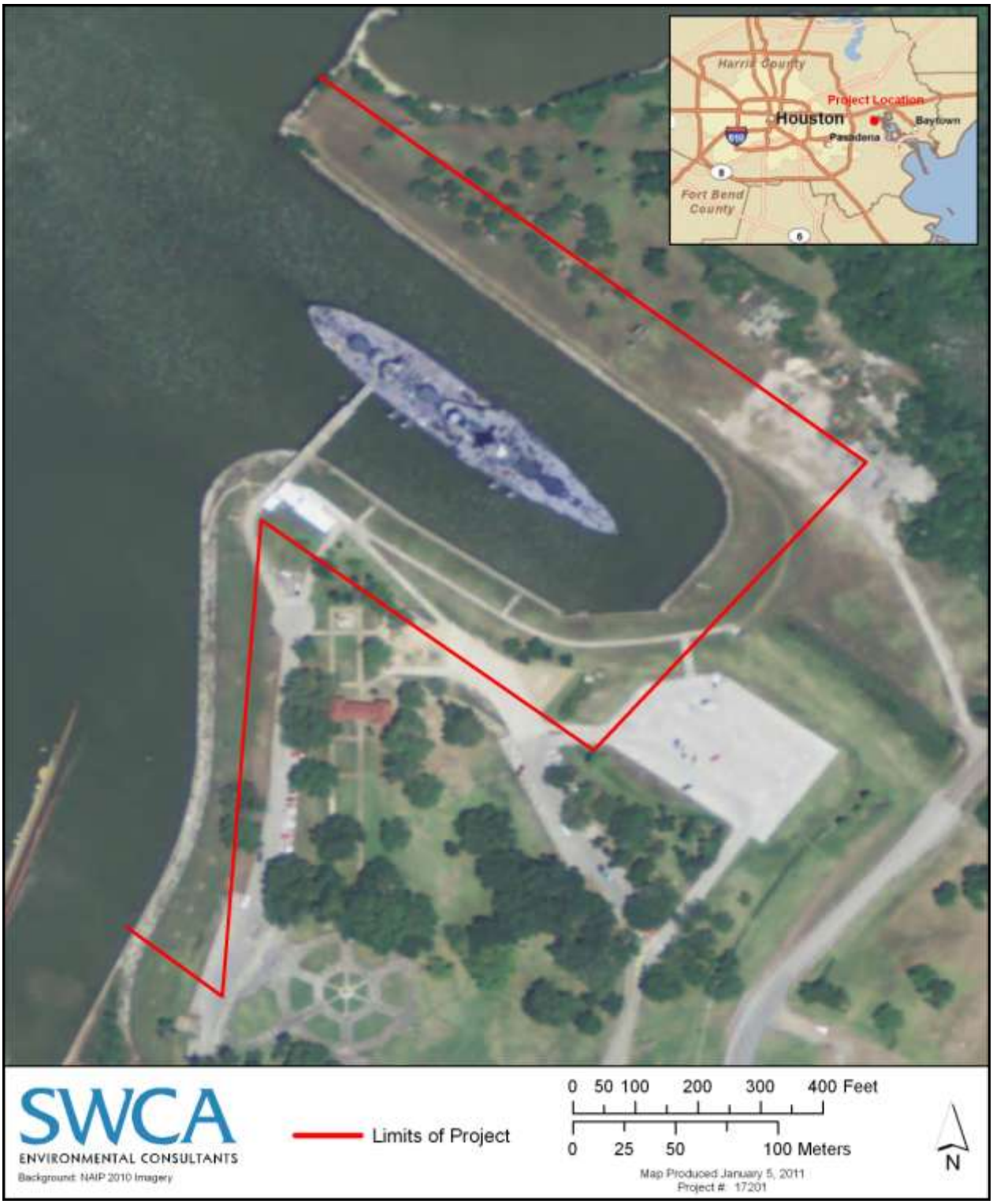

Figure 1. Proposed Project Area for the Battleship *Texas* Dry Berthing Project.

authorities, municipal utility districts and school districts to notify the THC of any action involving five or more acres of ground disturbance; 5,000 or more cubic yards of earth moving; or those that have the potential to disturb recorded archaeological sites. The Code is managed by the THC's Archaeology Division, including the issuance of formal Antiquities Permits, which stipulate the conditions under which scientific investigations will occur. The current proposed dry berthing project must comply with the Code because it involves land under control of the Texas Parks and Wildlife Department.

METHODS

The cultural resources constraints analysis consisted of a background review of the cultural resources literature for the project area. An SWCA archaeologist reviewed the Highlands and LaPorte, Texas USGS 7.5-minute topographic quadrangle maps on the Texas Archaeological Sites Atlas (Atlas) online database for any previously recorded surveys and historic or prehistoric archaeological sites located in or near the project area.

The SWCA archaeologists also searched the archives for the Battleship *Texas* and the San Jacinto Battleground State Historic Site on file at the San Jacinto Battleground State Historic Site facilities in La Porte and at the TPWD headquarters in Austin, Texas. All documents regarding the History of the Battleship *Texas* and all cultural resources investigations at the San Jacinto Battleground State Historic Site are housed at these locations.

RESULTS

GEOLOGY

The geology of the San Jacinto Battleground State Historic Site was researched in detail during a Texas Department of Transportation (TXDOT) project conducted by Prewitt and Associates in 2007 (Frederick 2007). This report identifies three types of soils found within the San Jacinto Battleground State Historic Site. These are the Beaumont Formation, Holocene alluvium, and dredge spoil.

SOILS

The majority of the San Jacinto Battleground State Historic Site is underlain by the Beaumont Formation. This deposit is a body of Pleistocene-age river and delta sediments that were deposited by streams during one or more periods of high sea level (interglacials) before 35,000 years ago. The surface of the Beaumont Formation is weathered, and its appearance near the ground surface is characterized by a well-developed soil, typically a vertisol. This kind of soil has a black clay topsoil with tendencies to shrink when dry and swell when wet, which allows material to move vertically in the profile by either falling down cracks or being pushed up by expansive forces when the soil is wet (Frederick 2007).

The soil survey of Harris County (Wheeler 1976) mapped two variants of the Lake Charles series across the Beaumont Formation deposits in the San Jacinto Battleground State Historic Site. Payne (1990) described the Beaumont Formation as having a black, organic-rich A-horizon over a yellow zone that transitioned to a strong brown or red B-horizon with abundant calcium carbonate nodules.

Holocene alluvium is found in Santa Anna Bayou to the east and in Peggy Lake to the southeast of San Jacinto Battleground State Historic Site (Bureau of Economic Geology 1982; Payne 1990). Payne noted that the valley floor upon which Peggy Lake is formed is mantled with Holocene alluvium deposited by the San Jacinto River during periods of flooding, as well as by small streams that are erod-

ing the Beaumont Formation along the edge of the valley and depositing that sediment in cone-shaped alluvial fans at the point where the streams empty out into the valley floor. Payne (1990) noted that these recent alluvial sediments are sandy and often contain iron-manganese concretions. Within the park Frederick (2007) found possible Holocene alluvium in a few cores. These deposits were visually distinct from the Beaumont Formation in that they were only slightly altered or unaltered by soil development and often exhibited sedimentary structures in the form of horizontal laminations. The colors of these deposits are indicative of prolonged saturation (often referred to as gley colors), which promote reduction of iron and result in colors that are shades of gray and pale green.

Dredging of the Houston Ship Channel began in the 1870's, and dredge spoil was deposited on the western side of the San Jacinto Battleground through the early twentieth century, resulting in the deposition of more than 3 feet of spoil (EDAW 2005:9). The precise location of the spoil is not known, but the locations of some spoil deposits are visible on early historic aerial photographs. Recent areas of dredge spoil have been mapped by the Bureau of Economic Geology (1982), Fisher et al. (1972) and Wheeler (1976).

Wheeler (1976:53) provided the best description of this material. He classified dredge spoil as soils of the Ijam series, consisting of clayey or loamy sediment of light gray, dark gray, or olive gray color, with brown mottles, a few shell fragments, and occasional thin discontinuous strata of sand, silt, or clay loam.

BACKGROUND REVIEW

The proposed project area has a long and complex history. First and foremost, the area is part of the San Jacinto Battleground State Historic Site (41HR277). The San Jacinto Battleground is listed as a National Historic Landmark and a Texas Historic Landmark. It is the site of the historic battle of San Jacinto where the Texan forces defeated the Mexican Army and officially established Texas' independence from Mexico on April 21, 1836.

The battle took place on a league of land that had been granted to Arthur McCormick. After the battle, the McCormick family returned to the area to continue working their plantation. Upon their return, they found their lands covered with the decomposing bodies of dead Mexicans. The McCormick matriarch contacted Sam Houston, the newly elected president of the Republic of Texas and demanded that "them dead Mexicans" be removed from my land (Wharton 1930:126; Cartier and Hole 1972: 28). The rotting bodies were neither removed nor buried. They lay unburied all through the summer and by the autumn the pasture was littered with skeletons. Cattle knawing on the bones reportedly developed spoiled milk. The McCormick's were finally induced to bury the skeletons in trenches (Smithwick 1900:92; Cartier and Hole 1972: 28). Recent sources indicate that the location of the buried Mexicans has never been found (Turner 2010).

Shortly after the battle, Nathaniel Lynch platted the nearby community of San Jacinto, hoping to attract buyers from the many visitors and souvenir collectors visiting the battlegrounds. Lynch died less than a year later (in February of 1837), and development of the community was slow with only five of the 232 lots sold (Glass 1995).

Among the early settlers in San Jacinto was the Habermehl family which had emigrated from Wurtenburg, Germany. They constructed their two-story home on a small hill about two hundred yards northwest of the present site of the San Jacinto monument. The family cemetery is near the site of the home.

The citizens of San Jacinto established a small cemetery near the graves of those who had died in the battle of San Jacinto. The "New Hope" sawmill opened in 1846 on land that was formerly part of the McCormick League. Two shipyards were constructed adjacent to the sawmill (Cartier and Hole 1972), and San Jacinto developed a strong economic basis in building and repairing ships for the entire bay area.

The construction of the Galveston railroad in the early 1870's had an adverse effect on the river shipping trade. In 1875 a hurricane destroyed the port of Indianola on Matagorda Bay and it swept up the coast doing considerable damage to all the coastal cities and the shipping trade. Much of the town of San Jacinto was swept away in a 20 foot storm surge (Hoyt and Schmidt 1996).

The Buffalo Bayou Ship Channel Company was formed in 1869, and dredging began in 1870 on the portion known as the Houston-Galveston Ship Channel. This dredging deposited much of its soil in a marsh adjacent to the battleground. Subsequent dredging and the widening of the Buffalo Bayou between 1870 and 1970 to form the Houston ship channel has removed all but a few lots of the historic town of San Jacinto. The sawmill and the shipyard sites have also been destroyed.

The first 10-acre tract of the Battleground was purchased by the State in 1883 to protect the area where the dead heroes had been buried (Cartier 1972). The Daughters of the Republic of Texas was formed in November of 1891 for the purpose of "urging the state to purchase the San Jacinto Battleground and erect a monument in commemoration of its heroes" (DeVault 1999). In 1898, it was necessary to post a notice that private burials on the state grounds were prohibited. It appears that the locals were utilizing the grounds as a "potter's field" (Cartier and Hole 1972). More recent sources (EDAW 2005:60) indicate that the potter's field was located to the north of the San Jacinto Cemetery and still has not been located.

An additional 327 acres of the Battleground was purchased in 1901. On April 21, 1910 San Jacinto's Battleground Park had its opening. Two concrete landings, 100 feet in length and 1,100 feet apart, and a crescent promenade had been constructed near the water's edge. The banks were terraced and dressed with Bermuda grass. An artesian well had been dug to provide drinking water, and the driveway around the cemetery had been initiated. By 1915 an ornate pavilion and keeper's lodge was under construction, which included restrooms and dressing rooms (Cox 2002:34). Other buildings constructed on the site included a large dance pavilion, a gardener's residence, a barn, a tool house and work shop, a well house and a decorative pergola (EDAW 2005:41).

In 1916, Jack and Bertha Sanders established a small lunch counter near the Lynchburg ferry. The facility soon outgrew its initial location and was moved to an old dance hall near the northeastern corner of the state park (Cartier and Hole 1972:47). In 1926, the former dance hall was destroyed by fire and a new structure was built and reopened in 1927. The restaurant soon gained worldwide acclaim serving tens-of-thousands of pounds of fish, chicken and shrimp to the public and visiting dignitaries in an average year. In 1977 subsidence of the area required that the 1927 structure be demolished and a duplicate building was constructed about a hundred feet away. The business closed in 1987 and the land was purchased by TPWD for inclusion in the San Jacinto Battleground State Historic Site.

The San Jacinto Monument and reflecting pool were constructed by the Works Progress Administration (WPA) between 1836 and

1839. The monument was built in the central area of the Battleground between the camps of the opposing forces on the highest piece of ground in the park. The reflecting pool was designed to mirror the reflection of the monument.

At the end of World War II, the Battleship *Texas*, a dreadnought-class battleship built in 1912 was scheduled to be sold as scrap. The citizens of Texas raised money to tow the old warship to Texas and establish a permanent berth at the battlegrounds on the Houston Ship Channel. The United States Navy turned the ship over to the state and she was recommissioned as the flagship of the Texas Navy on April 21, 1948. Prior to 1983 the *Texas* was administered by the Battleship Texas Commission. The Texas Legislature transferred the care of the *Texas* to TPWD on September 1, 1983.

The Battleship *Texas* is also known as the *USS Texas*, BB35 and archaeological site number 41HR744. It is a National Historic Landmark and listed on the National Register of Historic Places. It is a Texas State Archaeological Landmark and was designated a National Historical Mechanical Engineering Landmark in 1975.

The berthing area for the Battleship *Texas* was initially constructed in 1948. An inlet was specially created by dredging out a portion of the bank to make a berth for the ship. The *Texas* remained in its berth until 1988 when the ship was moved and taken to a dry dock for much needed repairs. (Mosley and Associates 2000:5). During the years prior to 1988 the *Texas* sat embedded in the mud in the bottom of her berth. The lower compartments of the ship were flooded. To facilitate the removal of the vessel, it was necessary to dredge the area surrounding the ship. "Great effort" was required to pull the ship out of the mud, and a pump failure during transport to the repair dock almost resulted in the sinking of the ship (Mosley and Associates 2005:15, 17). While the ship was being retrofitted, the berthing area was refurbished. A new bulkhead and shoreline revetment was constructed. A new approach-way bridge and moveable brow were constructed to allow access to the ship. Other improvements included a ticket booth, sidewalks and ramps, and a timber observation walkway (Mosley and Associates 2005). The berthing area was dredged deeper to allow the ship to float and widened by approximately 130 feet to the north - from approximately 220 feet to 350 feet (Ing 1996). Even after these modifications, silt from the ship channel is continuously being deposited in the berthing area. This requires periodic maintenance dredging of the slip to keep the *Texas* afloat and prevent the hull from becoming re-embedded in the mud.

The latest TPWD interpretive plan for the San Jacinto Battleground State Historic Site includes an effort to separate the Battleship *Texas* component from the San Jacinto Battleground component. This would in part involve the transfer of all ship-related facilities to the north side of the berthing area – away from the site of the 1836 Texan encampment. The renovations include one of four possible designs for the dry berthing of the Battleship *Texas*. The proposed dry berthing of the ship would dramatically minimize repair and maintenance costs, remove the ship from imminent danger of flooding and advanced corrosion, and preserve this National Register property for future generations (TPWD 2008).

ARCHAEOLOGICAL INVESTIGATIONS

In 1967, the Coastal Industrial Water Authority was created to distribute water from Lake Livingston to the Gulf Coast agricultural and industrial area. In 1971, a portion of this project required the installation of three 9-foot diameter pipes across the western portion of

the San Jacinto Battleground State Historic Site along the Lynchburg Ferry Road (Highway 134). Archaeologists from Rice University conducted archival research and archaeological survey and testing along the route of the pipeline (Cartier and Hole 1972; Takac et al. 2000). No intact archaeological deposits related to the Battle of San Jacinto were recovered by the Rice University archaeologists and they concluded that all of the artifacts recovered during their excavations were secondarily deposited dredge spoil (Cartier and Hole 1972:136). They furthermore stated that "the battleground has been picked over by souvenir hunters from the day of the battle to the present time. Consequently, there is slim chance today of finding battle field relics …." (Cartier and Hole 1972: xiv).

In 1977 an archaeologist was called to investigate historic artifacts uncovered during the placement of a waterline to the south of the monument (Ralph 1996:309-310). Construction activities had uncovered a well-defined historic trash pit. Artifacts were collected and the remains were reburied. Approximately one week later, road grading to the east of the monument uncovered a second area with a number of historic artifacts some of which dated to 1840-1865 (Ralph 1996). These discoveries were recorded as sites 41HR316 and 41HR317 (Hollingsworth 2000:137).

In 1983 David Ing reported on testing for four proposed dump sites within the park, south of the monument. The sites were to be used for the deposit of soil donated to TPWD from the construction of a nearby pipeline (Ing 1984). This fill would then be used by TPWD to construct a levee along the north side of the park. Approximately 50 small pits were excavated but no artifacts were found.

In 1988, Ing conducted testing along Buffalo Bayou when the berth for the battleship *Texas* was enlarged (Ing 1996). Ing's work included the excavation of 16 backhoe trenches in a random manner across the proposed dredging impact zone. He found no artifacts associated with the 1836 Battle of San Jacinto. He did however find what he interpreted to be features associated with the 1927 San Jacinto Inn. Concrete slabs and foundation piers were found 5 feet below the surface in Trench 5. In another trench, sections of the asphalt parking lot for the Inn were also found. These features were covered by a thick layer of dredge spoil. Using information provided by a former employee of the San Jacinto Inn, the restaurant dump was located in a proposed dredge spoil area approximately 400 feet east of the extant inn structure. The main body of the dump measured "approximately 100 feet square and some piles were up to 4 feet high" (Ing 1996).

During monitoring of the berth enlargement by Mike Davis in September of 1989, the concrete slabs from the 1927 San Jacinto Inn were removed by heavy machinery. Davis noted that the concrete piers for the Inn were of two types. The first type was solid concrete and measured one foot square. The second type, measured approximately 1.5 feet square, was constructed of buff colored "Butler" and dark red "Mexia" bricks. In some cases the brick piers had been coated with a cement plaster. No effort was made during testing or monitoring to collect artifacts. Relatively few artifacts were observed, and these included red bricks stamped "Mexico", asbestos shingles, heavy green banded hotel or restaurant ironstone ceramics, fragments of green, brown and clear bottle glass and red clay tile. All artifacts were found on the contact zone between the upper fill and the concrete slab.

After the initial testing phase was complete, it was recommended that no further archaeological investigations would be required before dredging could begin. The subsurface tests and the documentary evidence gathered to date were considered sufficient documentation

of the area and would serve to complete the cultural resources mitigation of the early San Jacinto Inn. A final recommendation was made to preserve the Inn dump from dredge spoil or levee construction activities (Ing 1996). However, the "dump" was not assigned an archaeological site number, nor is its location shown in the project report.

In the spring of 2000, TPWD began a large project of upgrading the various water and sewer lines within the park. Archaeological investigations consisted of the monitoring of backhoe trenching during the placement of the water and sewer lines (Hollingsworth 2001: 133; Tomka and Smart 2000). Portions of this project were conducted in the vicinity of the *Texas* berth. Trenches were excavated along the southern edge of the berthing area to the restrooms, tourist shop and fire hydrant near the battleship. Soils in the trenches near the battleship exhibited about 24 inches (60 cm) of fill with possible undisturbed sediments below 60 cm (Tomka and Smart 2000:20). No historic or prehistoric artifacts were recovered during trenching in this area. Both Hollingsworth (2001:137) and Tomka and Smart (2000:24) concurred with Cartier and Hole (1972:127) that "souvenir hunters had quickly picked the site clean of obvious artifacts and disturbance of the soils caused by dredging, road construction, and park landscaping have nearly completely altered or destroyed the archaeological record".

In 2002, test excavations were conducted on site 41HR865 – a scatter of nineteenth-century artifacts accidently discovered during the construction of an Interpretive Trail within the park (Feit et al. 2002). Site 41HR865 is located to the north of the monument and is not associated with any of the known historic homesteads that were previously located in the area. During testing, evidence for one of the early shell roads within the park was discovered. Excavations further concluded that the artifact scatter was apparently isolated and not associated with evidence for any former structure. It was also surmised that the artifact scatter may have been secondarily deposited (Feit et al. 2002).

Starting in 2004, a survey undertaken by Moore Archaeological Consulting, Inc. identified areas where dredge spoil and other artificial fills have been placed within the site. This investigation discovered that the distribution of artificial fills is considerably less extensive than had been previously believed. It also disclosed that that the surface soils over most of the area lack evidence of significant disturbance, therefore archaeological remains from the 1836 battle may be preserved *in situ* at the site (EDAW 2005:14).

Geoarchaeological investigations of the San Jacinto Battleground State Historic Site were conducted in 2007 (Frederick 2007). Investigations concentrated on the area to the south of the monument and around the Battleship *Texas* berth. Soils south of the monument were found to be relatively intact. One of the two cores placed to the south of the Battleship exhibited an intact ground surface. The other core in this area was placed next to the public parking lot for the Battleship and showed that the original ground surface had been removed and replaced with fill. All of the cores from the southeast of the Battleship berth were ultimately found to have been placed within an area that was a swamp in 1836. This swamp has been filled with dredge spoil (Frederick 2007). No cores were placed in the area to the north of the Battleship – the area that will be most impacted by the proposed modifications.

ARCHAEOLOGICAL ASSESSMENT

At this time, a preferred design for the proposed dry berthing project has not been selected. The engineering designs include four different proposed concepts (TPWD 2008: 20-

26). Each of the proposed concepts involves moving access for the ship to the north side of the berthing area. The proposed project APE would include a strip of land approximately 120 to 140-feet-wide surrounding the existing berthing area. It also includes modifications to a portion of the levee and the shoreline south of the berthing area adjacent to the ship channel (Figure 1).

Early archaeological investigations in the area have recorded numerous prehistoric shell middens along the shores of Buffalo Bayou/San Jacinto River, or on the edge of the bluff overlooking these waterways. All of the known shoreline sites are presumed to have been destroyed by the widening of the Houston Ship Channel, subsidence, or erosion. Sites 41HR416 and 41HR488, located on the bluff, are the only prehistoric sites known to remain within the boundaries of the San Jacinto Battleground State Historic Site (Hollingsworth 2000: 138; Cox and Tomka 2002). Lacking any tangible evidence to the contrary, it is possible that prehistoric archaeological deposits could remain preserved beneath levees and dredge fill along the shoreline.

Investigations south of the *Texas* berth have yielded artifacts from the 1836 Battle of San Jacinto. Monitoring of water trench excavations in 2000 (Tomka and Smart 2000:25) demonstrated that "natural deposits are still present below about 50-60cm (20-24 inches) in some parts of the area west of Battleground Road, and in the area surrounding the tourist shop and rest rooms". Subsequent geoarchaeological investigations by Frederick (2007) support this conclusion.

Maps provided by TPWD indicate that part of the proposed project APE is located within the original 10-acre park purchase. Historic research indicates that a late-nineteenth-century pauper's cemetery is located somewhere within this 10-acre area. The exact location of this cemetery has never been found.

Ing's (1996) work to the north of the *Texas* berth was primarily concentrated in the area to be affected by the 1988 birth expansion. His efforts located features and artifacts associated with the 1927-1977 San Jacinto Inn under a thick layer of dark brown clay that was interpreted to be fill introduced to the area after the 1977 demolition of the 1927 San Jacinto Inn. In several trenches Ing (1996) observed a zone of tan sand with red clay inclusions, limestone cobbles and oyster shell beneath the 1927 Inn deposits. This zone was interpreted to represent dredge spoil from the ship channel prior to 1927.

It is possible that additional features for the 1927-1977 Inn still exist outside of the area explored by Ing. The location of the original 1926 San Jacinto Inn that opened within an "old dancehall" near the park and burned within the same year is unknown. It may or may not have been located in the same place as the 1927-1977 era Inn. Therefore it is possible that archaeological deposits associated with the 1926 San Jacinto Inn may be impacted.

An archaeological investigation of the area to the north of the present berth could potentially uncover additional features associated with the 1926 and/or 1927 San Jacinto Inns. Investigations in this area would also determine if the 1836 Battlefield surface remains intact beneath the thick layer of fill as described by Ing.

SUMMARY AND RECOMMENDATIONS

The results of this study indicate early statements that "the archaeological record at San Jacinto Battleground State Historic Site has been completely destroyed by collectors, dredging, and park modifications" (Cartier

and Hole 1972; Tomka and Smart 2000, Hollingsworth 2001) are unsubstantiated. Recent archaeological investigations have recovered artifacts from the 1836 battle.

Recent investigations also indicate that backhoe trenching alone has proven an unreliable means of locating artifacts associated with the 1836 Battle of San Jacinto. Utilizing metal detectors, Battleground artifacts have been recovered during recent investigations both within and adjacent to the Park (EDAW 2005:14; Karbula et al. 2004). While earlier backhoe trench investigations (Tomka and Smart 2000) in some of the same areas concluded that no Battleground artifacts were present.

In light of these findings, construction activities associated with the proposed dry berthing project have the potential to impact any Battlefield surfaces preserved beneath fill material, as well as possible unmarked graves associated with the pauper's cemetery on the original 10-acre park tract. Proposed modifications to the shoreline along the ship channel also have the potential to impact previously unknown prehistoric sites buried beneath existing levees and dredge fill.

Compliance with cultural resource regulations such as the National Historic Preservation Act or the Antiquities Code of Texas is required prior to future development of the property. As such an exact scope of any requisite cultural resource investigations would need to be developed in coordination with the involved regulatory agencies. Depending on the selection of a final design for dry berthing and a definition area of the APE, the scope of work could range from archaeological monitoring of construction activities to an intensive investigation consisting of the mechanical removal of fill overburden to facilitate the exploration of buried natural ground surfaces.

REFERENCES CITED

Bureau of Economic Geology

1982 *Geologic Atlas of Texas, Houston Sheet (1:250,000)*, Bureau of Economic Geology, The University of Texas at Austin.

Cox, I Wayne and Steve A. Tomka

2002 *San Jacinto Battleground State Park: A Historical Synthesis and Archaeological Management Plan.* Archaeological Survey Report No. 318, Center for Archaeological Research, The University of Texas at San Antonio.

Cartier, R.R. and Frank Hole

1972 *History of the McCormick League and Areas Adjoining the San Jacinto Battleground.* Part I of San Jacinto Battleground Archaeological Studies, 1971-1972. Texas Antiquities Committee Permit Report No. 11. Department of Anthropology, Rice University, Houston Texas.

DeVault, J.

1999 *The Ladies and the Battlefield: A Partial Chronology of the Efforts of the San Jacinto Chapter, Daughters of the Republic of Texas to Save and Preserve the San Jacinto Battlefield – 1891-1999.* San Jacinto Chapter, Daughters of the Republic of Texas.

EDAW, Inc.

2005 *San Jacinto Battleground State Historic Site Cultural Landscape Report*. Report on file at Texas Parks and Wildlife Department, Austin.

Feit, Rachel, John Andrew Moreman and John Clark

2002 Archaeological Test Excavations at Site 41HR865: An Historic Debris Scatter at the San Jacinto Battlefield/Monument State Historic Park. Archaeology Series #105, Hicks & Company, Austin Texas.

Fisher, W.L., J.H. McGowen, L.F. Brown, Jr. and C.G. Groat

1972 *Environmental Geologic Atlas of the Texas Coastal Zone, Galveston -Houston Area*. Bureau of Economic Geology, The University of Texas at Austin.

Frederick, Charles D.

2007 *Geoarchaeological Evaluation of Portions of the San Jacinto Battleground, Harris County, Texas*. Letter Report No. 774, Prewitt and Associates, Inc., Austin, Texas.

Glass, J.L.

1995 *A Study of the San Jacinto Battleground Focus: Lynchburg, Oakland, San Jacinto and Wooster.* Manuscript on file, Spanish Record Book B, General Land Office, Austin, Texas.

Hollingsworth, Ted.

2001 *San Jacinto Battleground State Historical Park Harris County: Impact Monitoring at site 41HR277.* In Texas Parks and Wildlife Division Cultural Resources Program 2000 Annual Report to the Texas Historical Commission, Austin, Texas.

Hoyt, Steve D. and J.S. Schmidt.

1996 *National Register Testing in the Lynchburg Townsite, Harris County, Texas: Lynchburg Pump Station Feasibility Study.* Espey Huston & Associates, Austin, Texas.

Ing, David J.

1984 *San Jacinto Battleground State Park; Archeological Tests at Four Proposed Dump Sites, July 1974.* Archeological Report 22. Texas Parks & Wildlife Department, Historic Sites and Restoration Branch, Austin.

1996 *Archaeological Testing at the Battleship Texas Berth Enlargement: San Jacinto Battleground State Historical Park September 1988.* Document on file, Texas Parks & Wildlife Department, Austin.

Karbula, James W., Jonathan Jarvis and Rachel Feit

2004 *Archaeological and Historical Research at the San Jacinto Battleground Vol. II: Metal Detecting Along the Path of the Mexican Retreat at San Jacinto.* Archaeology Series #124, Hicks & Company,, Austin Texas.

Shiner Moseley and Associates, Inc.

2000 *Drydock Repairs for Battleship Texas: Drydocking, Repair and Berth Renovation.* Shiner Moseley and Associates, Inc. Corpus Christi, Texas.

Payne, Jeffrey G.

1990 Late Quaternary Geology of the Peggy Lake Area. In *Hunter-Fisher-Gatherers on the Upper Texas Coast: Archaeological Investigations at the Peggy Lake Disposal Area, Harris County, Texas*, by Eloise F. Gadus and Margaret Ann Howard, pp. 373-400. Reports of Investigations No. 74. Prewitt and Associates, Inc., Austin, Texas.

Ralph, Ronald W.

1996 *An Inventory of Cultural Resources within the Texas Park System: November 1976 through October 1981*. Document on file, Texas Parks & Wildlife Department, Austin.

Smithwick, Noah

1900 *The Evolution of a State or Recollections of Old Texas Days*. University of Texas Press, Austin.

Takac, Paul R., Jeffrey G. Paine and Michael B. Collins.

2000 *Reassessment of Ten Archaeological Sites along the Houston Ship Channel – Morgan's Point to Buffalo Bayou, Harris County, Texas.* Studies in Archaeology 38, Texas Archaeological Research Laboratory, The University of Texas at Austin.

Tomka, Marybeth S.F. and R. Jason Smart

2000 *Archaeological Monitoring of Water and Wastewater Improvements at San Jacinto Battleground State Historical Site (41HR277) Harris County, Texas.* In Texas Parks and Wildlife Division Cultural Resources Program 2000 Annual Report to the Texas Historical Commission. Austin, Texas. .

TPWD–Texas Parks and Wildlife Department.

2008 *Project Plan for the Dry Berthing of the Battleship Texas*. Document on file, Texas Parks & Wildlife Department, Austin.

Turner, Allan

2010 Study of skulls reveals stories of fallen Mexicans: Symposium will feature look at battle's other side. *Houston Chronicle* April 16 2010. http://www.chron.com/disp/story.mpl/metropolitan/6962924.html [accessed 12/22/2010].

Wharton, Clarence

1930 *San Jacinto: The Sixteenth Decisive Battle.* Kingsport Press, Inc., Kingsport, Tennessee

Wheeler, Frank F.

1976 *Soil Survey of Harris County, Texas.* Soil Conservation Service, U.S. Department of Agriculture. Washington DC.