Report for the Finding of No Effect to Archeological and Historical Resources Associated with the Proposed Improvements to the OCI Beaumont LLC Methanol and Ammonia Plant, Jefferson County, Texas

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by
David Driver,
Eleanor Stoddart,
and
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Moore Archeological Consulting, Inc.
Report of Investigations Number 622

January 2014

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MAC Project Number 14-04

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ABSTRACT

Moore Archeological Consulting, Inc. (MAC), has been asked to perform an archeological assessment to ascertain the potential for encountering cultural resources during an expansion of facilities at the OCI Beaumont LLC Methanol and Ammonia Plant, in Jefferson County, Texas. The investigations were conducted for at the request of Wolf Environmental LLC of Friendswood, Texas. The Project is subject to a Prevention of Significant Deterioration Permit from the Environmental Protection Agency (EPA). As a result, the undertaking also falls under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. MAC conducted the cultural resources survey of the Project Area in compliance with Section 106 of the NHPA. The purpose of the survey was to determine if the development of the Project Area had the potential to have an adverse effect on any significant cultural resources listed on or considered eligible for listing on the National Register of Historic Places (NRHP).

The proposed project includes three separate tracts within an existing methanol production plant located southeast of Beaumont, in Jefferson County, Texas. The project area is depicted on the Beaumont East, Texas, 7.5' USGS topographic quadrangle map (Figure 1). The project areas comprise portions of a large industrial/refinery plant located along the southwestern shoreline of the McFadden Bend Cutoff of the Neches River.

The three distinct project tracts (Figure 2) consist of a 12.8-acre pad containing two large methanol storage tanks (Area A), a long, rectangular 13.5-acre tract housing various equipment, piping, and structures related to processing tasks (Area B), and a roughly rectangular, 1.5-acre pad containing one large ammonia storage tank (Area C). The proposed project mainly consists of the renovation and reactivation of existing infrastructure, and does not include substantial new construction impacts or ground surface disturbances in Areas A and C. In Area B, a maximum of 170 pilings for structural support will be bored, each with a diameter of 18 inches. This will affect approximately 28 m² of ground surface, in an area that has been previously disturbed by a variety of industrial activities.

A records review and desk-based assessment of the properties in terms of their potential for containing cultural resources was conducted in June 2012 (see Appendix 1) and reassessed in January 2014which included an expansion of the existing desk-based assessment and a limited program of backhoe testing at the project site. The background review examined an area extending 3 kilometers (km) from the proposed project boundary (see Figure 3).The subject properties were reviewed with reference to the State of Texas archeological site files, soil classifications, topography, and possible tract disturbances. These data were then compared to an existing site location predictive model (Moore 1996) for prehistoric sites in the region as well as additional MAC GIS databases.

The current proposed project is primarily focused on already existing structures and facilities, with no new impacts to ground surfaces in Areas A and C. The impacts to ground surfaces in Area B will occur on previously-disturbed land. No linear facilities (*i.e.* pipelines) are planned for this project, and all laydown areas used for stockpiling materials will be located on previously-disturbed land. Based on these factors, negative backhoe trenching and other (hydro-trenching) direct subsurface examination results, MAC concludes that the probability for encountering prehistoric or historic cultural resources within the three project areas is extremely low, and that no further archeological investigation is justified.

No cultural resources were identified within the proposed project location, and there is a low probability that intact cultural resources are present that would be eligible for the National

Register of Historic Places (NRHP). It is the opinion of MAC that the proposed project area does not require any further intensive cultural resources survey and that no archeological or historical properties would be adversely affected.

However, in the unlikely event that any cultural materials (including human remains or burial features) are inadvertently discovered at any point during construction, use, or ongoing maintenance of the Project Area, even in previously surveyed areas, all work at the location of the discovery should cease immediately, and the Texas Historical Commission (THC) and the EPA should be notified of the discovery.

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INTRODUCTION

Moore Archeological Consulting, Inc. (MAC) has been asked to perform an archeological assessment to ascertain the potential for encountering cultural resources during an expansion of facilities at an existing methanol production plant in Jefferson County, Texas. The investigations (MAC PN 14-04) were conducted at the request of Wolf Environmental LLC of Friendswood, Texas. The Project is subject to a Prevention of Significant Deterioration Permit from the Environmental Protection Agency (EPA). As a result, the undertaking also falls under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Section 106 is invoked when federal funds are utilized, or when federal permitting is required for a proposed project. MAC conducted the cultural resources survey of the Project Area in compliance with Section 106 of the NHPA. The purpose of the assessment was to determine if the development of the Project Area had the potential to have an adverse effect on any significant cultural resources listed on or considered eligible for listing on the National Register of Historic Places (NRHP).

The proposed project includes three separate tracts within an existing methanol production plant located southeast of Beaumont, in Jefferson County, Texas. The Project Area is depicted on the Beaumont East, Texas, 7.5' USGS topographic quadrangle map (Figure 1). The Project Areas comprise portions of a large industrial/refinery plant located along the southwestern shoreline of the McFadden Bend Cutoff of the Neches River. The three distinct project tracts (Figure 2) consist of a 12.8-acre pad containing two large methanol storage tanks (Area A), a long, rectangular 13.5-acre tract housing various equipment, piping, and structures related to processing tasks (Area B), and a roughly rectangular, 1.5-acre pad containing one large ammonia storage tank (Area C). The proposed project mainly consists of the renovation and reactivation of existing infrastructure, and does not include substantial new construction impacts or ground surface disturbances in Areas A and C. In Area B, a maximum of 170 pilings for structural support will be bored, each with a diameter of 18 inches. This will affect approximately 28 m² of ground surface in an area that has overwhelmingly been previously disturbed by a variety of industrial activity.

The original scope of work indicated no ground disturbances would occur within the project boundaries and a desk-based assessment was carried out in June of 2012. In December 2013, MAC was made aware of the inclusion of ground disturbance in Area B, and has edited this report to reflect the changed scope of the work. Fieldwork was carried out on January 21, 2014, and consisted of a limited program of backhoe trenching in Area B in order to determine if any intact soils remained which contained cultural resources. The subject properties were reviewed with reference to the State of Texas archeological site files, soil classifications, topography, and possible tract disturbances. These data were then compared to an existing site location predictive model (Moore 1996) for prehistoric sites in the region as well as additional MAC GIS databases. Additional work included the production of a report suitable for review by the Texas Historical Commission (THC), which serves as the State Historic Preservation Office (SHPO) for the state of Texas, and the Council of Texas Archeologists (CTA) Guidelines for Cultural Resources Management Reports. David Driver (Ph.D, RPA) served as the project's principal investigator, while Roger Moore (Ph.D, RPA, President, MAC) supervised field investigations and Eleanor Stoddart (M.A.) edited and made additional contributions to the final report.

This report presents the results of this cultural resource survey. Following this introduction, the following sections present the environmental and cultural background, respectively, of the Project Area. The fourth section describes the results of previous archeological investigations and the fifth section the results of the desk-based assessment. The

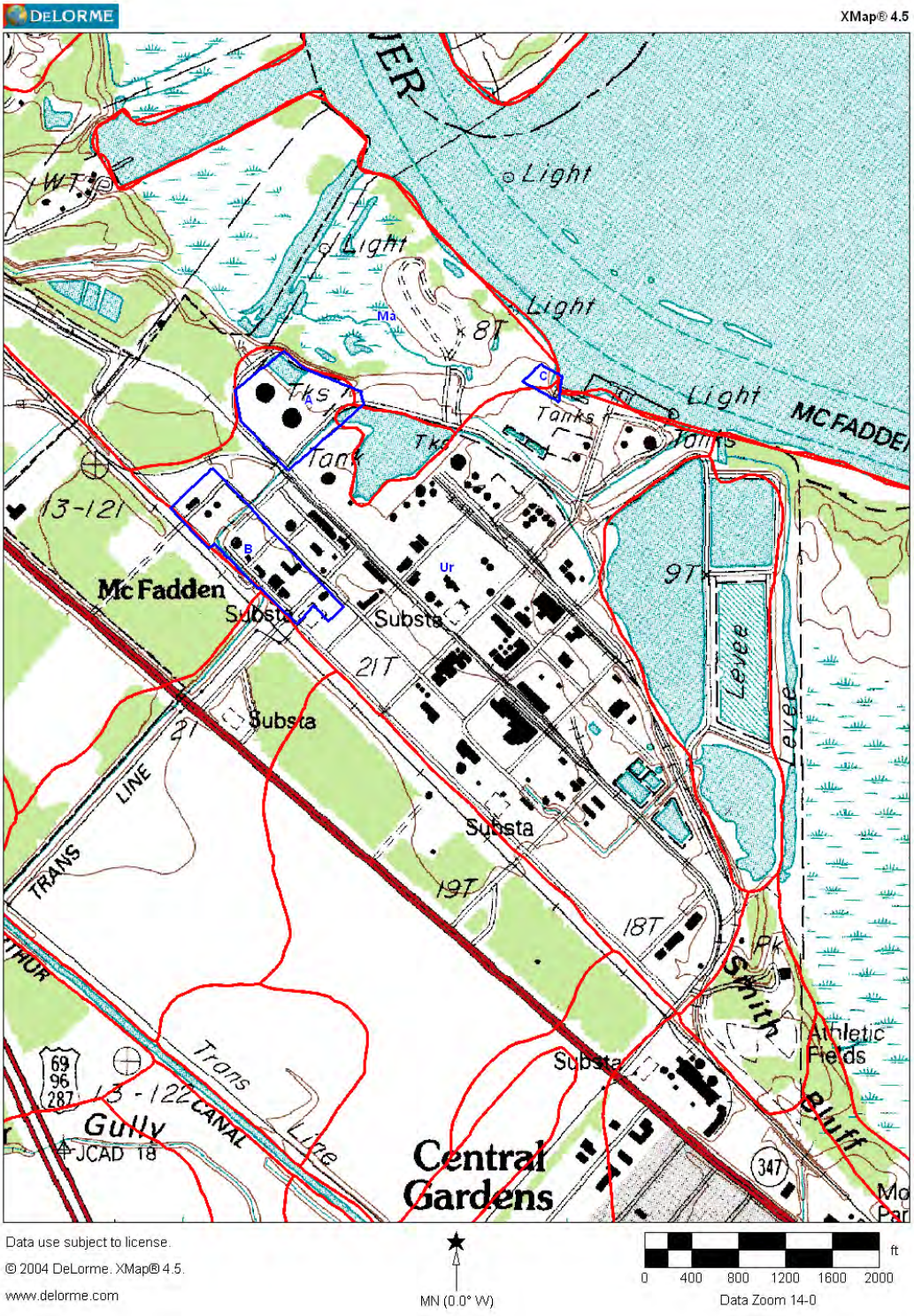

Figure 1. Map of proposed project location (Beaumont East Quad, USGS).

Figure 2. Aerial photograph of the proposed project location areas (Google Earth).

sixth section presents the results of the archeological field investigations, followed by MAC's conclusions and cultural resource management recommendations for the project. Appendix A shows available historic aerial photographs and topographic maps of the Project Area, and Appendix B contains the original desk-based assessment. Appendix C contains the borehole logs. Appendix D contains the curriculum vitae of the Principal Investigator.

ENVIRONMENTAL BACKGROUND

Soils and Geology

Jefferson County is located within the West Gulf Coastal Plain physiographic province (Hunt 1974). In the Texas region, the surface topography of the plain is characterized by relatively flat topography that dips slightly towards the Gulf of Mexico. Geologically, the Project Area lies atop the Beaumont Formation, a surface outcrop that extends from just east of the Mississippi River in Louisiana, to Kingsville, Texas (Bureau of Economic Geology 1982). The formation was deposited during a series of glacial and interglacial events during the Middle to Late Pleistocene. Extensive riverine downcutting and erosion of the formation occurred during the periods of lower sea levels associated with the Wisconsin glaciation. During the Holocene, after sea levels rose once more, the resulting river valleys filled with alluvial soils, creating broad, level floodplains.

The proposed Project Area is depicted on sheet 20 of the Soil Survey of Jefferson County, Texas (Crout et al. 1965). Three types of soil occur within the project tracts, Acadia silt loam, 1 to 5 percent loam (AcB), Crowley silt loam (Ct), Made Land (Ma). The entirety of Area A and the western two-thirds of Area B are mantled by Crowley silt loam soils, which are described as poorly drained, with slow surface runoff and very slow internal drainage. The eastern third of Area B is composed of Acadia silt loam, which is described as poorly drained with slow to rapid runoff and slow internal drainage. The poor drainage characteristics of these soils, suggest these areas would not have been preferred locations for prehistoric occupation sites (which tend to occur more often on sandy, well-drained soils). In addition, the western half of Area B is noted on the map as having "topsoil removed", thereby lessening the chances of an intact cultural or historic resources remaining (Crout et al. 1965). Area C is in an area identified as Made Land, which is described as consisting of sediments "excavated from canals, ditches, or waterways, and deposited on other soils" (Crout et al. 1965:12). Most Made Land is located in areas that were previously marshlands, and thus represents low probability areas for prehistoric occupations sites.

In addition, the SSURGO (Soil Survey Geographic Database) produced and distributed by the Natural Resources Conservation Service (NRCS) - National Cartography and Geospatial Center (NCGC) and available online indicated Areas A and B are now entirely within lands classified as "Urban" meaning they are too disturbed for classification (Figure 3). Only Area C is still classified as it was in 1960, as "Made Land".

Climate

The modern climate of the Jefferson County study area has characteristics of both the tropical and temperate climate zones (Crout et al. 1965:67). Summer temperatures average 82°F (28°C), while winter temperatures average 55°F (13°C). Annual precipitation averages 55.2 inches (140.2 cm).

Hydrology

The current Project Area is located on the south bank of the modern Neches River at the McFadden Tuning Basin (previously known as the Beaumont Reserve Fleet Basin). However, the current channel is an artificially constructed 'cut-off' of a large bend in the natural stream course, and thus does not represent the original channel location.

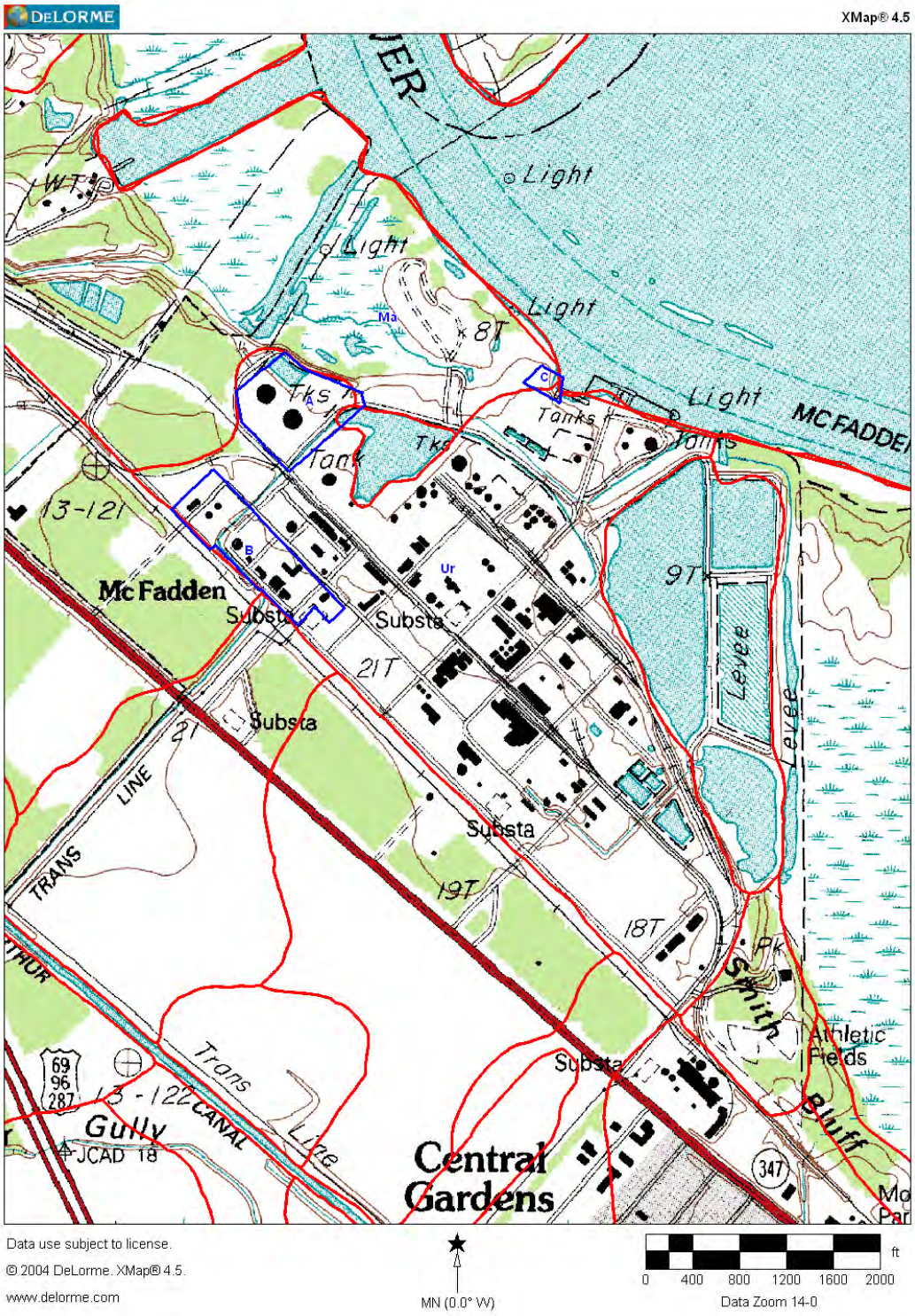

Figure 3. SSURGO (Soil Survey Geographic Database information showing Areas A and B classified as “Urban” and Area C classified as “Made Land”.

Flora and Fauna

Jefferson County lies within the Austroriparian biotic province (Blair 1950:98-101). Not determined by a marked physiographic break, the western boundary of this province is loosely identified by the distribution of pine and hardwood forests on the eastern Gulf coastal plain. San Jacinto County is situated within the pine-oak subdivision of the Austroriparian province (Tharp 1939). Blair (1950) lists the dominant floral species of the pine-oak forest subdivision as loblolly pine (*Pinus taeda*), yellow pine (*Pinus echinata*), red oak (*Quercus rubra*), post oak (*Quercus stellata*), and blackjack oak (*Quercus marilandica*). Hardwood forests are found on lowlands within the Austroriparian and are characterized by such trees as sweetgum (*Liquidambar styraciflua*), magnolia (*Magnolia grandiflora*), tupelo (*Nyssa sylvatica*), water oak (*Quercus nigra*), and other species of oaks, elms, and ashes, as well as the highly diagnostic Spanish moss (*Tillandisia usneiodes*) and palmetto (*Sabal glabra*).

Blair (1950) and Gadus and Howard (1990) identify the following mammals as common within the Austroriparian province: white-tailed deer (*Odocoileus virginianus*), muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), opossum (*Didelphis virginiana*), *Scalopus aquaticus, Pipistrellus subflavus, Lasiurus borealis, Sciurus niger, Sciurus carolinensis, Glaucomys volans*, *Geomys breviceps*, *Reithrodonomys fulvescens*, *Peromyscus leucopus*, *Oryzomys palustris*, cotton rat (*Sigmodon hispidus*), packrat (*Neotoma floridana*), eastern cottontail (*Sylvilagus floridanus*), and swamp rabbit (*Sylvilagus aquaticus*). Bison (*Bison bison*) may have been present on nearby grasslands at various times in the past (Gadus and Howard 1990:15). Common land turtles include eastern box turtle (*Terrapene carolina*) and *Terrapene ornata*, while snapping turtle (*Chelydra serpentinia*), mud turtle (*Kinosteron spp*.), river cooter (*Chrysemys concinna*) and diamondback terrapin (*Malaclemys terrapin*) comprise common water turtles. Common lizards include *Anolis carolinensis, Sceloporus undulatus, Leiolopisma laterale*, *Eumeces laticeps*, *Cnemidophorus sexlineatus* and *Ophiosaurus ventralis*. Snakes and amphibians are also present in considerable numbers and diversity.

CULTURAL BACKGROUND

Southeast Texas Culture History

The Project Area is located within the southeast Texas archeological region (Patterson 1995; Story et al. 1990). The culture history of the region extends back at least 12,000 years into the past. A number of researchers have compiled chronological frameworks to describe the cultural histories of the area (Aten 1983; Ensor 1991; Patterson 1995; Shafer et al. 1975; Story et al. 1990). The majority of these divide human occupation into four broad stages, Paleoindian, Archaic/Lithic, Ceramic/Late Prehistoric, and Historic. The stages are based on a proposed sequence of economic strategies as they are revealed through the archeological and/or historical record. These proposed shifts in dominant lifeways consider cultural, economic, and technological factors in order to provide a heuristic model useful for attempting to understand ancient and early historic populations. While the dates assigned to the period interfaces are based on "absolute" dating methods, they of course represent a generalized time range for the implied cultural evolution. The dates provided in the following discussion will be drawn from Ensor (1991) and are presented in Table 1.

The earliest period of occupation in southeast Texas is identified as the Paleoindian stage. Based on the earliest securely dated appearance of populations in the New World, this stage begins around 11,000-10,000 B.C., and lasts for approximately 4000 years. During this time, it is proposed that populations continued with a highly nomadic hunting tradition brought with them from the Old World. Traditional models emphasize the heavy reliance that these groups placed on the hunting of the large mammals of the Pleistocene. Plant foods and small game undoubtedly supplanted this diet, and may have played a more important role than previously thought (Black and McGraw 1985; Patterson 1995). Artifact types associated with this phase include various fluted and non-fluted lanceolate projectile points, such as Clovis and Folsom. In general, due to a paucity of well-stratified older sites, the Paleoindian stage remains poorly defined in southeast Texas.

Table 1. Archeological Chronology for Southeast Texas (after Ensor 1991).

Time Period	Dates
Paleoindian	10,000-8000 B.C.
Early Archaic	8000-5000 B.C.
Middle Archaic	5000-1000 B.C.
Late Archaic	1000 B.C.-A.D. 400
Early Ceramic	A.D. 400-800
Late Ceramic	A.D. 800-1750
Historic	post A.D. 1750

By 8000 B.C., the Late Wisconsin glaciation had ended, increasing climatic aridity and creating extensive changes in the environment. As a result, the majority of Pleistocene megafauna became extinct. This required drastic changes in the dominant subsistence strategies of the affected populations. By 8000 B.C., the start of the Early Archaic stage, the remaining southeast Texas populations had adapted to the environmental changes by shifting to a lifeway dominated by seasonal scheduling. This type of subsistence economy specializes in a regionally

circumscribed and repetitive exploitation of specific floral and faunal resources. By remaining in familiar territory, the nomadic populations were able to better exploit the various resources available within their local environment.

However, research has suggested that human population densities remained low in the area, and may have even decreased significantly during this time (Moore and Moore 1991). Eventually, the stabilization of the climate by around 1000 B.C., the start of the Late Archaic, appears to have led to increasing populations. This rise in regional population may have been further facilitated by the development of long-distance trade, technological innovations, and changing social relations (Patterson 1995).

The final prehistoric period in southeast Texas is marked by the emergence of ceramics. Ceramic artifacts appear in the archeological record of the Galveston Bay area by approximately A.D. 100, and by A.D 500, had been adopted by a number of inland populations (Pertulla et al. 1995). A plain, sand-tempered type of ceramic identified as Goose Creek became prevalent during the period, although a number of decorated varieties and tempering materials were also present (Patterson 1995; Pertulla et al. 1995). The appearance of Caddoan pottery in southeast Texas around A.D. 1000-1300 has been used to suggest the presence of extended trade networks or migration during this time (Aten 1983). The period has also been associated with the introduction of the bow and arrow around A.D. 600 (Aten 1983).

Protohistoric Settlement

Prior to European settlement, the Neches River was an important source of food and shelter for various coastal-dwelling Native American tribes, including the Caddo, the Karankawa and Atakapa (Crout et al. 1965). The Neches River gained its name from the Spanish who took the name from the Caddo word "Nachawi," meaning "wood of the bow," bois d'arc trees, that grew along its banks (Donovan 2007).

Several burial mounds relating to the Karankawa have been found in the Port Neches area, approximately 7 km south west of the Project Area. In 1841, records show that six large burial mounds existed at Grigsby's Bluff (now Port Neches). Their contents consisted entirely of clam and sea shells, skeletons, pottery shards, and other unspecified Native American artifacts (Block 1976). By 1901, all six of the mounds had disappeared as a result of human actions.

Historic Overview

European contact in the region began in the early 16th century with the ill-fated Narváez expedition that, in 1528, deposited Cabeza de Vaca onto the Texas coastline, possibly on Galveston Island. More long-term contacts resulting from permanent European settlement did not directly impact aboriginal lifeways in southeast Texas until the early 18th century (Patterson 1995). However, European diseases introduced by explorers and early traders had begun to affect Native American populations in Texas by the 16th century (Ewers 1974). Throughout the eighteenth and nineteenth centuries, epidemic diseases, the mission system, and the fur trade seriously reduced, and in some cases exterminated, the indigenous populations residing in the region.Though visited by both French and Spanish explorers and traders during the 18th century, the first European settlement in the Jefferson County area did not began until 1824 with the establishment of the community that would become Beaumont (Kleiner 1996). As one of the original counties of the Republic of Texas, the county was formed in 1836, with its first county seat at Old Jefferson on the Cow Bayou. Port Arthur was founded in 1894 by Arthur Stilwell, as a coastal port link in his newly established Kansas City, Pittsburg, and Gulf Railroad (Storey 1996).

PREVIOUS ARCHEOLOGICAL INVESTIGATIONS

Prior to beginning field investigations, Moore Archeological Consulting, Inc., performed a background investigation of archeological and historical literature relevant to the Project Area. Literature examined for this project includes site inventory records on file at the Texas Archeological Research Laboratory (TARL), previous archeological investigative reports on file at the Texas Historical Commission (THC) and Moore Archeological Consulting, Inc. and other published literature pertinent to the current project. The archival background search determined that no previously recorded archeological sites are located in or near (within ½ km) the project property (Figure 3).

The Project Area is, however, located in a region closely associated with important historical events related to the discovery of oil and the development of the petroleum industry in Texas. Located approximately 3.2 km to the west is the Lucas Gusher, Spindletop Oilfield National Register District. This historic district and landmark commemorates the local oil boom of the early 20th century that followed the Spindletop gusher of 1901. The Lucas Gusher National Register District covers approximately 1100 acres (ca. 1.7 square miles), and though only partially surveyed contains a number of historic sites and structures related to the area's 20th century petroleum industry.

In terms of prehistoric resources, the earliest work done in Jefferson County was conducted by G. E. Arnold in 1940 for the University of Texas (TARL records). Later surveys include work in Sea Rim State Park and the J. D. Murphree Wildlife Management Area (Lorrain 1973; McMichael and Bosarge 1979; Moore and Booth 1972). Controlled excavations include work by the Texas Archeological Society at site 41JF27 (unpublished) and the excavations at sites 41JF26 and 41JF31 (Aten and Bollich 1981).

The three closest archeological sites to the current Project Area are located along the Neches River and McFaddin Turning Basin, approximately 1-3 km to the northeast and southeast of the Project Area. A limit of 3 km from the Project Area was chosen as a research boundary as it encompassed all major landform types of the surrounding area. The larger survey area than the estimated project disturbance was chosen to ensure adequate coverage of the Project Area. The archeological sites are mostly represented by prehistoric occupations and *Rangia* shell midden sites. The Neches River channel has changed location from its original route, as the current channel was dredged in the 1940s.

Site 41JF5 consisted of a shell midden located on the west bank of the original Neches River channel, approximately 2.6 km east of the proposed Project Area, on the opposite bank of the river. The site was approximately 150 ft long, and consisted of a deposit of clam shells, potsherds, and fragments of unidentified animal and bird bones exposed in the bank of the Neches River. A total of 106 potsherds were recovered from the surface of the site. At the time of recording in 1940 "excessive" floodwaters covered a portion of the site, which extended below the water line. Since then, Site 41JF5 has been completely covered with water.

Site 41OR2 (located approximately 1.75 km northeast of the Project Area) also consisted of a shell midden deposit exposed in the north bank of the Neches River in low-lying, swampy terrain. The site was about 30 m long, and contained clam shells and bone fragments, as well as four potsherds. The largest portion of this site appeared to under flood waters at the time of the 1940 survey and what was left had been deeply eroded. The site was reported as destroyed in 1973 after an attempt was made to locate it during a boat survey of the Sabine and Neches Rivers

Map Redacted

Figure 4. Previously-recorded archeological sites

(McGuff and Roberson 1974). It is considered possible that the site has completely eroded away since first being recorded.

Site 41OR13 is immediately north of the original Neches River Channel, as the current river channel is now located further to the south than the original channel. Site 41OR13 is located approximately 2.8 km north-west of the proposed Project Area, on the opposite side of the river. The site area begins immediately west of Anderson Gully and extends a distance of approximately 1000 feet further west along the beach. The site consists of a shell midden, originally recorded in the 1940's and last visited and assessed in 1973. When revisited in 1973 the site condition was recorded as poor; though the beach was scattered with shell and ceramic, no *in situ* cultural material was located owing to erosion. It was estimated that less than 5% of the site remained.

None of the above-mentioned sites are within the project APE, and none will be affected by the proposed project. The National Register of Historic Places was also consulted and indicated no listed sites will be affected by the proposed development.

DESK-BASED ASSESSMENT

MAC examined the map plotting for the Project Area in reference to the State of Texas archeological site files, soil classifications, topography, and possible tract disturbances. These data were then compared to an existing site location predictive model (Moore 1996) for prehistoric sites in the region as well as additional MAC GIS databases.

Potential for Cultural Resources

The Project Area was also assessed with respect to the following hierarchy of environmental factors that combine to make a locality attractive for prehistoric settlement within the region. The factors in combination constitute a set of settlement rules that define good locations for prehistoric campsites (Moore 1996). These include preferences for the following:

(1) Site locations in forested environments.

(2) Site locations in the floodplain or on the floodplain/upland margin.

(3) Site locations in proximity to sources of potable water.

(4) Site locations on well-drained, loamy soils.

(5) Site locations on topographic high points.

(6) Site locations on geologic terraces in watersheds with broad 100-year floodplains. These terraces may range from 100-1000 meters in width and may be of Late Pleistocene age or younger. They thus present good settings for the discovery of cultural remains as much as 10,000-12,000 years old.

(7) Site locations on the upland/floodplain margin typified by the Lissie and Beaumont slopes to streams with broad floodplains. As geologically old surfaces, these upland margins also present potentially good settings for prehistoric remains.

The proposed Project Area is depicted on sheet 20 of the Soil Survey of Jefferson County, Texas (Crout et al. 1965). Three types of soil occur within the project tracts, Acadia silt loam, 1 to 5 percent loam (AcB), Crowley silt loam (Ct), Made Land (Ma). The entirety of Area A and the western two-thirds of Area B are mantled by Crowley silt loam soils, which are described as poorly drained, with slow surface runoff and very slow internal drainage. The eastern third of Area B is composed of Acadia silt loam, which is described as poorly drained with slow to rapid runoff and slow internal drainage. The poor drainage characteristics of these soils, suggest these areas would not have been preferred locations for prehistoric occupation sites (which tend to occur more often on sandy, well-drained soils). Area C is in an area identified as Made Land, which is described as consisting of sediments “excavated from canals, ditches, or waterways, and deposited on other soils” (Crout et al. 1965:12). Most Made land is located in areas that were previously marshlands, and thus represents low probability areas for prehistoric occupations sites.

The association with sources of water has been demonstrated to be a dominant factor affecting the probability of prehistoric sites in southeast Texas. Most sites within the region are found within 300 m of a current or former source of natural potable water. The current Project Area is located on the south bank of the modern Neches River at the McFadden Tuning Basin (previously known as the Beaumont Reserve Fleet Basin). However, the current channel is an

artificially constructed ‘cut-off’ of a large bend in the natural stream course, and thus does not represent the original channel location. The presence of three prehistoric shell middens on the bank of the original channel indicates the Neches River has been stable since at least the Ceramic period. A review of curated USGS maps and Google Earth aerials reveals that in 1938, the basin and new channel were still marshlands, but that the new channel had been constructed by the early 1940s.

In terms of potential historic resources, a review of curated USGS topographic maps and aerial photographs dating from 1938, 1943, 1946, 1960, 1989, 1995, and 1998 (see Appendix A) indicates that area has had little impact from development (other than the current route of the Kansas City Southern Railroad and evidence of cultivation) until industrial development began in the late 1950s.

The 1960 topographic map shows extensive development in Areas A and B, which has continued until present day. By the late 1980s, even Area C shows evidence of industrial development, continuing until present.

ARCHEOLOGICAL FIELD INVESTIGATIONS

On January 21, 2014, a site visit was conducted by Dr. Roger Moore, and consisted of the observation of the excavation of one backhoe trench in Area B, and the visual inspection of the results of a hydro-excavation program that had been completed several days previously.

Area A

Area A consists of a 12.8-acre pad containing two large methanol storage tanks. No historic resources were noted in a background search of the State of Texas archeological site files, soil classifications, topography, and possible tract disturbances. These data were then compared to an existing site location predictive model (Moore 1996) for prehistoric sites in the region as well as additional MAC GIS databases.

The proposed project does not include substantial new construction impacts or ground surface disturbances in Area A. No new cultural resources were identified within the proposed project location, and no intact cultural resources are present that would be eligible for the National Register of Historic Places (NRHP). No fieldwork was carried out in this area.

Area B

Area B is a long, rectangular 13.5-acre tract housing various equipment, piping, and structures related to processing tasks. A maximum of 170 pilings for structural support will be bored, each with a diameter of 18 inches. As of the writing of this report, the exact numbers and precise locations of the pilings in Area B have not been determined. Each borehole will reach a maximum depth of 50 feet. This will affect approximately 28 m² of ground surface, in an area that has been previously disturbed by a variety of industrial activity. Two test boreholes were drilled in March 2013(shown in blue in Figure 5) and the results are included in Appendix C.

On the day of the site visit, visibility was excellent and no vegetation was present. A single backhoe trench was excavated in the safest location possible on the north-east portion of the site. The trench measured 2.3 m long x 0.75 m wide, with a maximum depth of 1.20 m (Figures 6, 7, 8). No other trenches were excavated due to safety concerns in this operating industrial facility with buried, active transmission pipes and other lines.

The results of the mechanical excavation are shown in Table 2 and a profile of the trench is shown in Figure 9. The upper two levels uncovered (0-12 cm dbs and 12-25 cm dbs) consisted of layers of fill made up of silt, crushed rock and shell. Beneath these layers was a layer of very dark gray silt (25-60 cm dbs). This sterile soil could possibly be undisturbed; no inclusions were noted. From 60-88 cm dbs, pale gray silt was present. This probable natural soil was sterile, with no inclusions. At a depth of 88 cm dbs, undisturbed Beaumont clay was exposed. This ancient natural soil was undisturbed, and excavation stopped at a depth of 120 cm dbs. No evidence of cultural resources was uncovered throughout the excavation program.

Several days before the archeological backhoe trench excavation, a hydro-excavation program was carried out by a subcontractor of OPI. This was done in an attempt to identify active buried pipes within the APE of Area B, in order to avoid them while boring the structural support pilings. Linear trenches, measuring approximately 0.20 m wide and 1.5 m deep were created when the soil was loosened using a high pressure water source. While these ground disturbances were not done under the supervision of an archeologist, the open trenches, along with the soil expelled by the hydro-excavation program were visually inspected by Dr. Moore (Figure 10). The locations of the hydro-excavation trenches are provided in Figures 11-13.

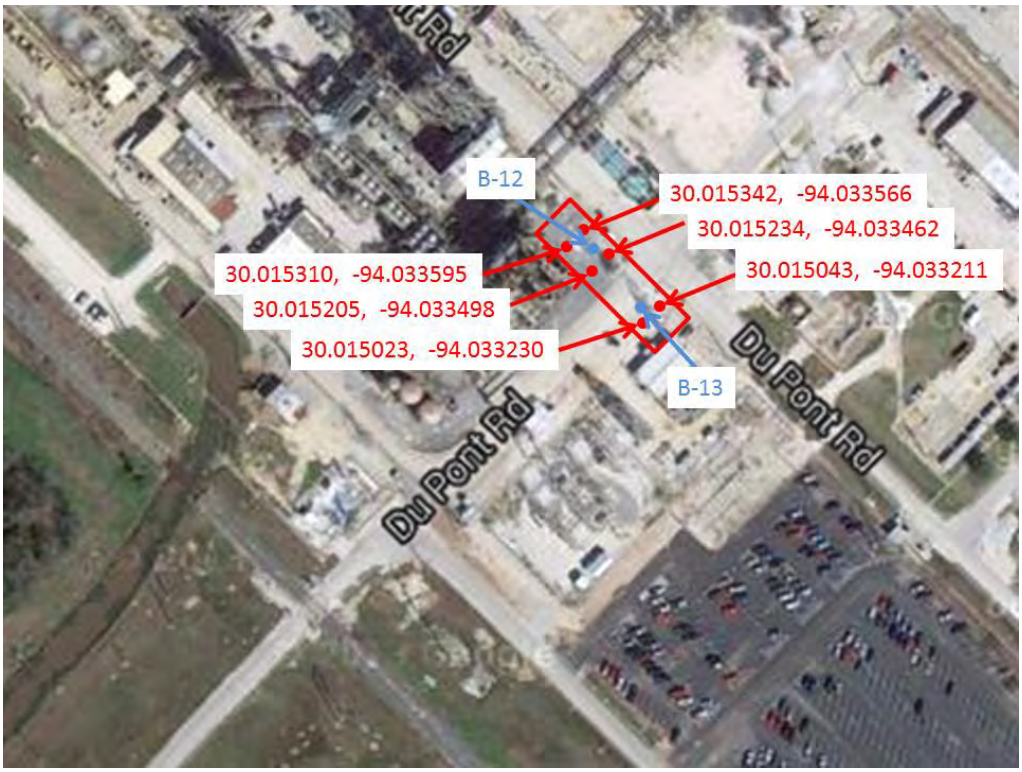

Figure 5. Locations of Boreholes

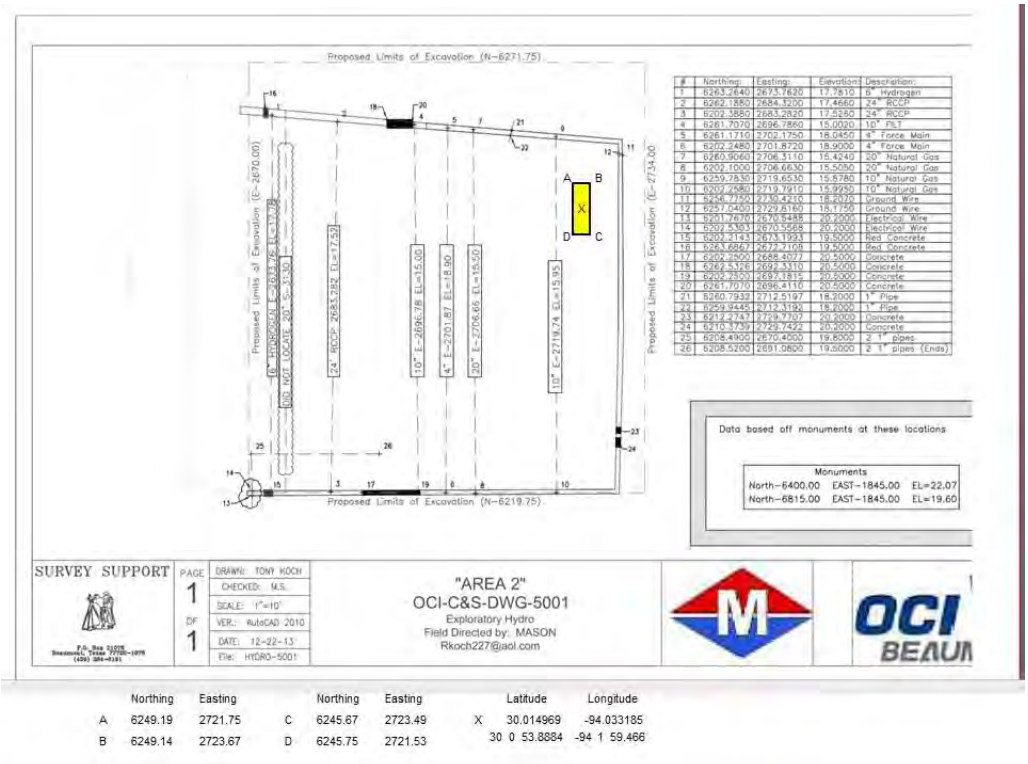

Figure 6. Location of Backhoe trench (highlighted in yellow), Area B. The project surveying contractor has provided the backhoe and hydro-excavation trench locations.

Figure 7. View east of backhoe trench

Figure 8. View west of backhoe trench revealing its proximity to active petrochemical production units.

Depth below surface (cmbs)	Description	Level of disturbance
0-12	"Road Base" Fill: shell, rock, light gray silt	Disturbed
12-25	Pale yellow silt with shell and rock, artificial fill	Disturbed
25-60	Very dark gray silt; no inclusions; possible natural soil. Sterile	Possibly undisturbed?
60-88	Pale gray silt with no inclusions. Probable natural soil. Sterile	Probably undisturbed?
88-120	Beaumont clay. Natural soil. Sterile	Undisturbed

Table 2. Backhoe Trench 1

Figure 9. View of east wall of backhoe trench.

Figure 10. Disposal stockpile for the hydro-excavation fill. Examination of this fill failed to disclose any artifacts or other cultural material.

Figure 11. Piping areas within which hydro-excavation was carried out.

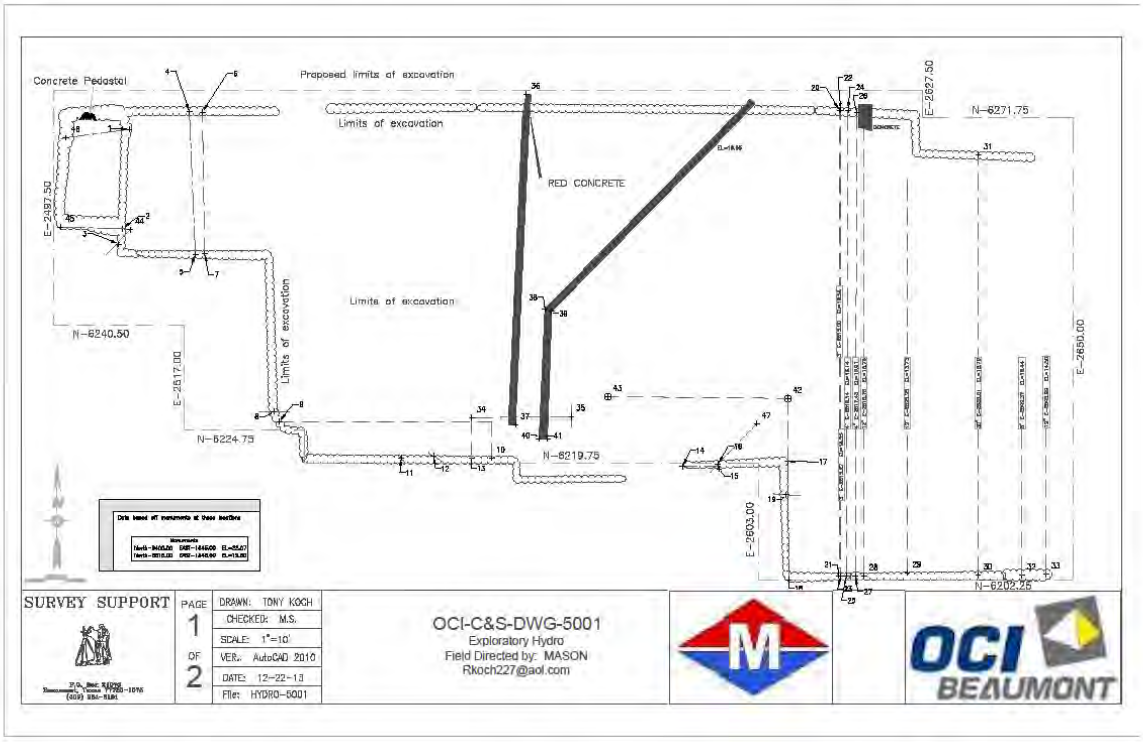

Figure 12. Hydro-excavation trenches within Piping Area 1.

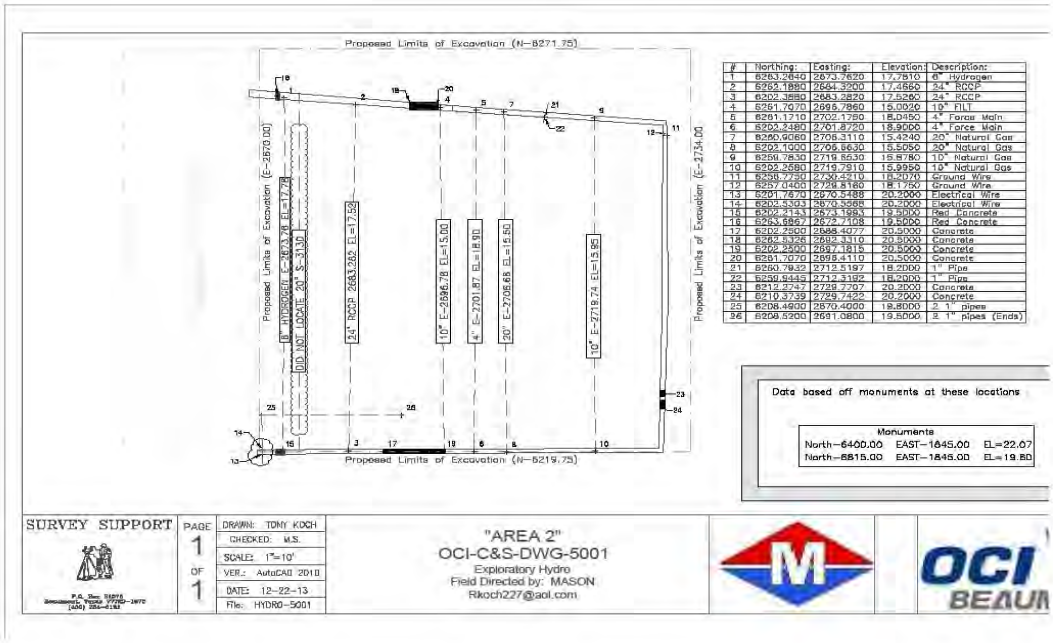

Figure 13. Hydro-excavation trenches within Piping Area 2.

These open hydro-excavation trenches were too narrow to photograph or examine closely. However, the trench walls could be examined with the aid of a powerful flashlight provided by the Contractor. Moore did not see any trace of obvious cultural deposits such as shell lenses, charcoal concentrations, or historic-period building footings during the wall examination. Similarly, no cultural materials were observed within the removed and stockpile soils derived from the hydro-excavations. No cultural resource deposits or features were identified within Area B, and no intact cultural resources are present that would be eligible for the National Register of Historic Places (NRHP).

Area C

Area C consists of a roughly rectangular, 1.5-acre pad containing one large ammonia storage tank. The proposed project does not include substantial new construction impacts or ground surface disturbances in Area C. Area C is in an area identified as Made Land, which is described as consisting of sediments "excavated from canals, ditches, or waterways, and deposited on other soils" (Crout et al. 1965:12). Most Made Land is located in areas that were previously marshlands, and thus represents low probability areas for prehistoric occupations sites. No new cultural resources were identified within the proposed project location, and no intact cultural resources are present that would be eligible for the National Register of Historic Places (NRHP). No fieldwork was carried out in this area.

Summary of Fieldwork Results

The survey methods employed during the survey represented a "reasonable and good faith effort" to locate significant archeological sites within the Project Area as defined in 36 Code of Federal Regulations (CFR) 800.3. No linear facilities (*i.e* pipelines) are planned for this project, and all laydown areas used for stockpiling materials will be located on previously-disturbed land. The negative excavation results, and the distance of Area B from water, combined with the large amount of previous disturbance and the very real safety issues associated with fieldwork on an active industrial site suggest no further fieldwork is justified for any of these areas. No evidence of prehistoric or historic cultural resources has been uncovered in either the background research or through fieldwork.

CONCLUSIONS

In summary, no historic or prehistoric archeological sites have been documented within the Project Area. The Project Area does not appear to meet any of the criteria often associated with preferred locations for prehistoric settlement, nor has the area experienced much in the way of historic development. Extensive industrial development, including the creation of "Made Land" in former marshland areas indicates a low probability for the existence or preservation of prehistoric cultural resources. Further, the current proposed project is primarily focused on already existing structures and facilities.

The three distinct project tracts (Figure 2) consist of a 12.8-acre pad containing two large methanol storage tanks (Area A), a long, rectangular 13.5-acre tract housing various equipment, piping, and structures related to processing tasks (Area B), and a roughly rectangular, 1.5-acre pad containing one large ammonia storage tank (Area C). The proposed project mainly consists of the renovation and reactivation of existing infrastructure, and does not include substantial new construction impacts or ground surface disturbances in Areas A and C.

While Tract B will undergo some ground disturbance, owing to the boring of up to 170 pilings for structural support will be bored, each with a diameter of 18 inches, they will be located in previously-disturbed areas subjected to years of construction activities. Fieldwork consisting of the monitoring of one backhoe trench carried out at a safe (and therefore relatively undisturbed) location in January 2014 indicated no evidence of any prehistoric or historic cultural resources. Further, no artifacts or features were observed within a network of pre-existing hydro-excavation trenches. The negative results of the subsurface investigations were anticipated due to the small size of the remnant relatively undisturbed portion of Area B and the fact that Area B is too distant for ready access to a natural water source. The remaining, greater portion of Area B is located within the footprint of an existing industrial facility where significant ground-disturbing activities have occurred in the past.

Subsequently, we conclude that the probability for encountering prehistoric or historic cultural resources within the three Project Areas is extremely low, and that no further archeological investigation is justified. MAC therefore recommends that Wolf Environmental LLC be allowed to proceed with the proposed expansion of the OCI Beaumont LLC Methanol and Ammonia Plant, relative to the jurisdiction of the EPA and Section 106 of the NHPA.

However, in the unlikely event that any cultural materials (including human remains or burial features) are inadvertently discovered at any point during construction, use, or ongoing maintenance of the Project Area, even in previously surveyed areas, all work at the location of the discovery should cease immediately, and the Texas Historical Commission (THC) and the EPA should be notified of the discovery.

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(NRCS) US Department of Agriculture, Natural Resources Conservation Service
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1975 *An Archeological Assessment of the Big Thicket National Preserve*. Anthropology Laboratory Research Report 17. Texas A&M University, College Station.

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APPENDIX A

Historic aerial photographs and USGS Topographic maps

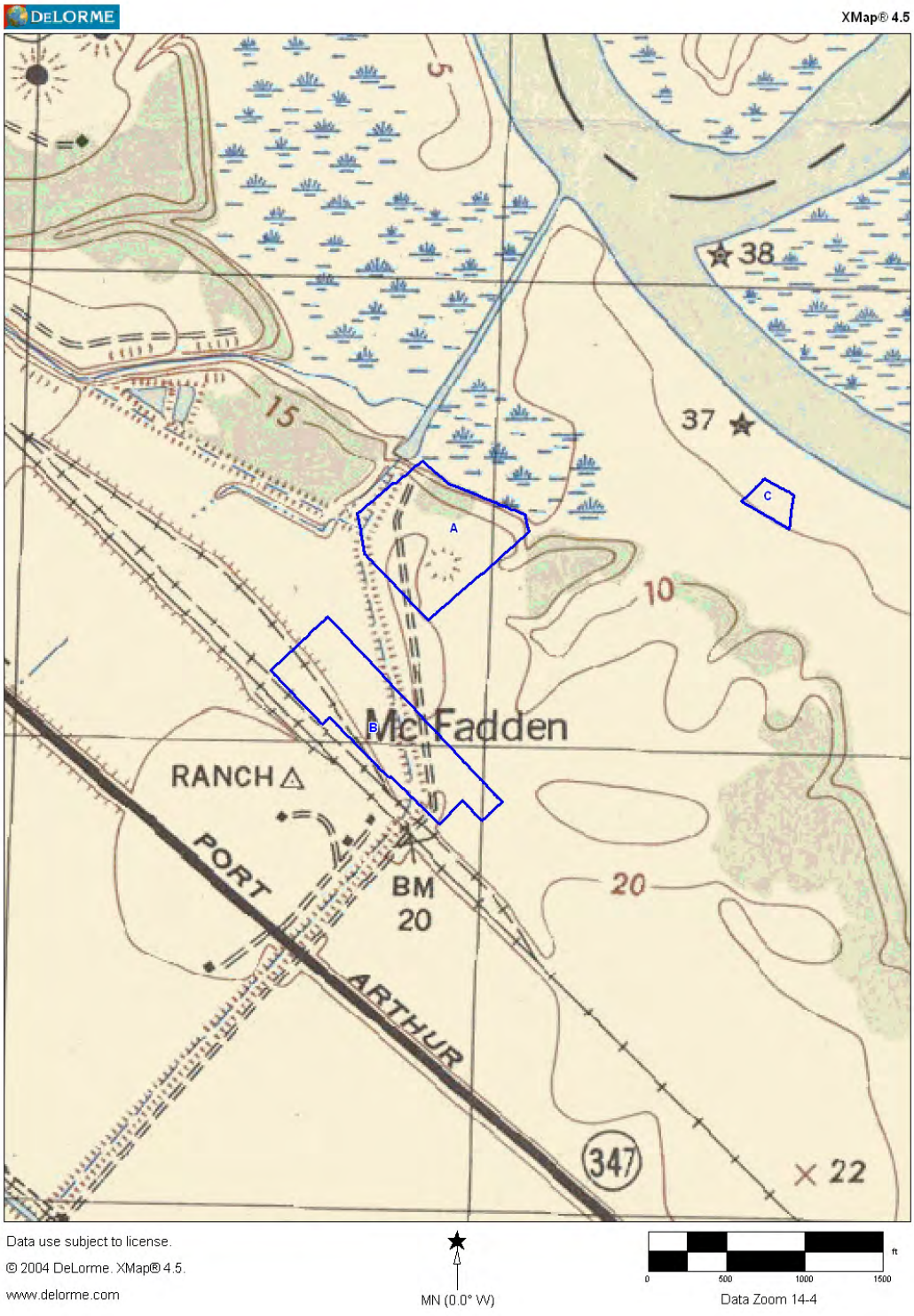


Figure 14. 1943 topographic map (Beaumont East Quadrangle USGS) overlain with Project Area boundaries.

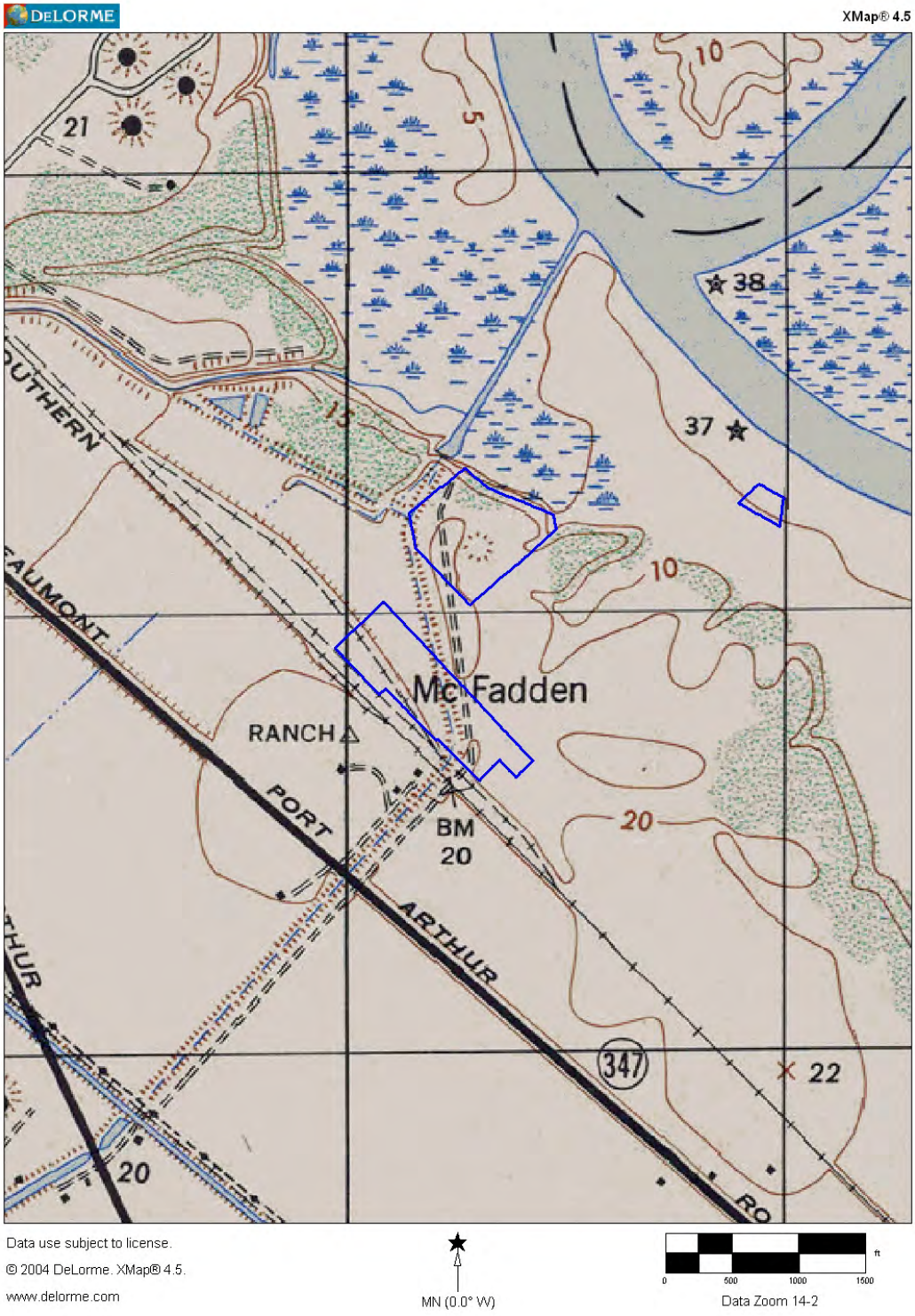


Figure 15. 1946 topographic map (Beaumont East Quadrangle USGS) overlain with Project Area boundaries.

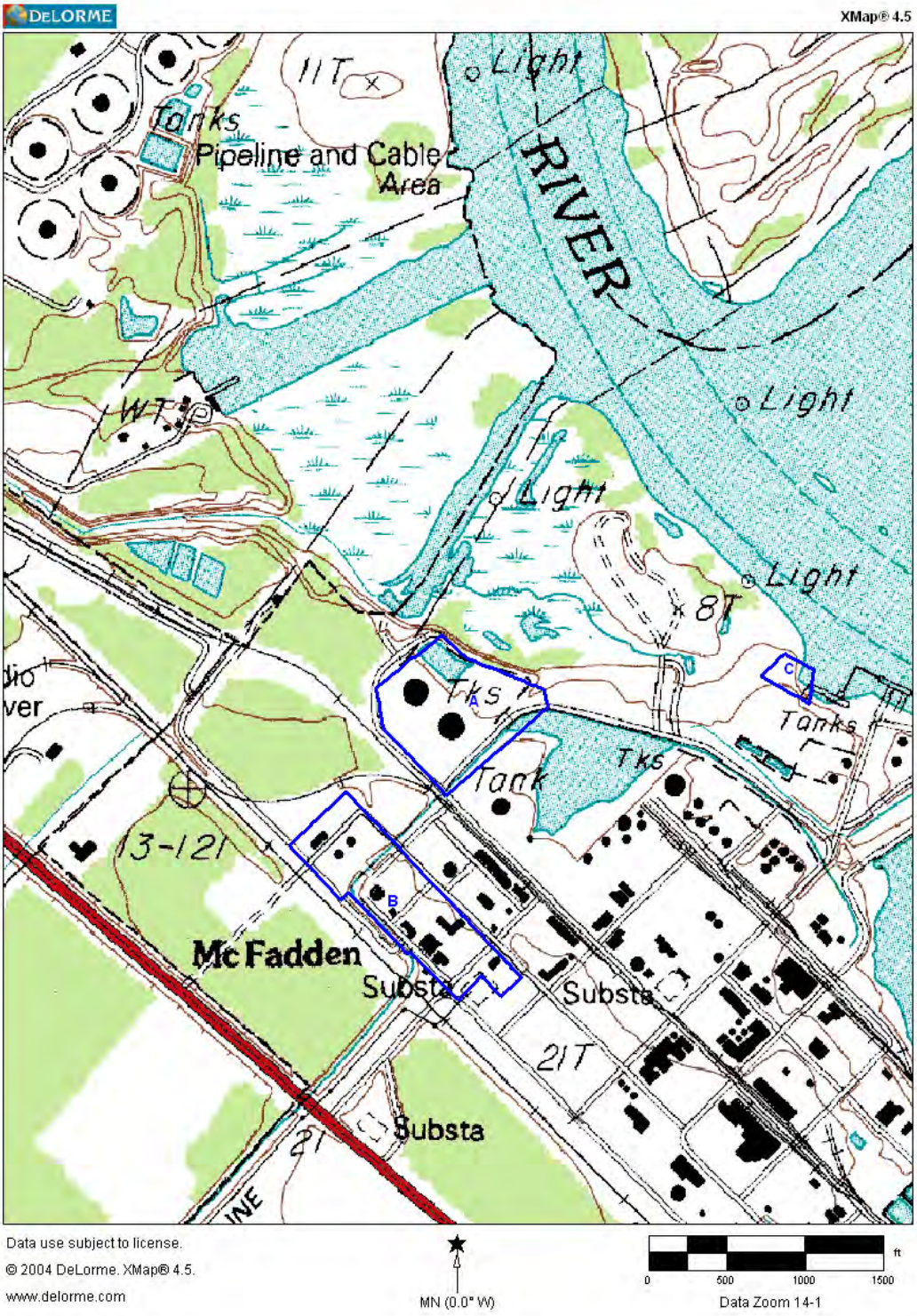


Figure 16. 1960 topographic map (Beaumont East Quadrangle USGS) overlain with Project Area boundaries.

Figure 17. 1938 aerial photograph (Beaumont East Quadrangle USGS) overlain with Project Area boundaries.

Figure 18. 1989 aerial photograph (Beaumont East Quadrangle USGS) overlain with Project Area boundaries.

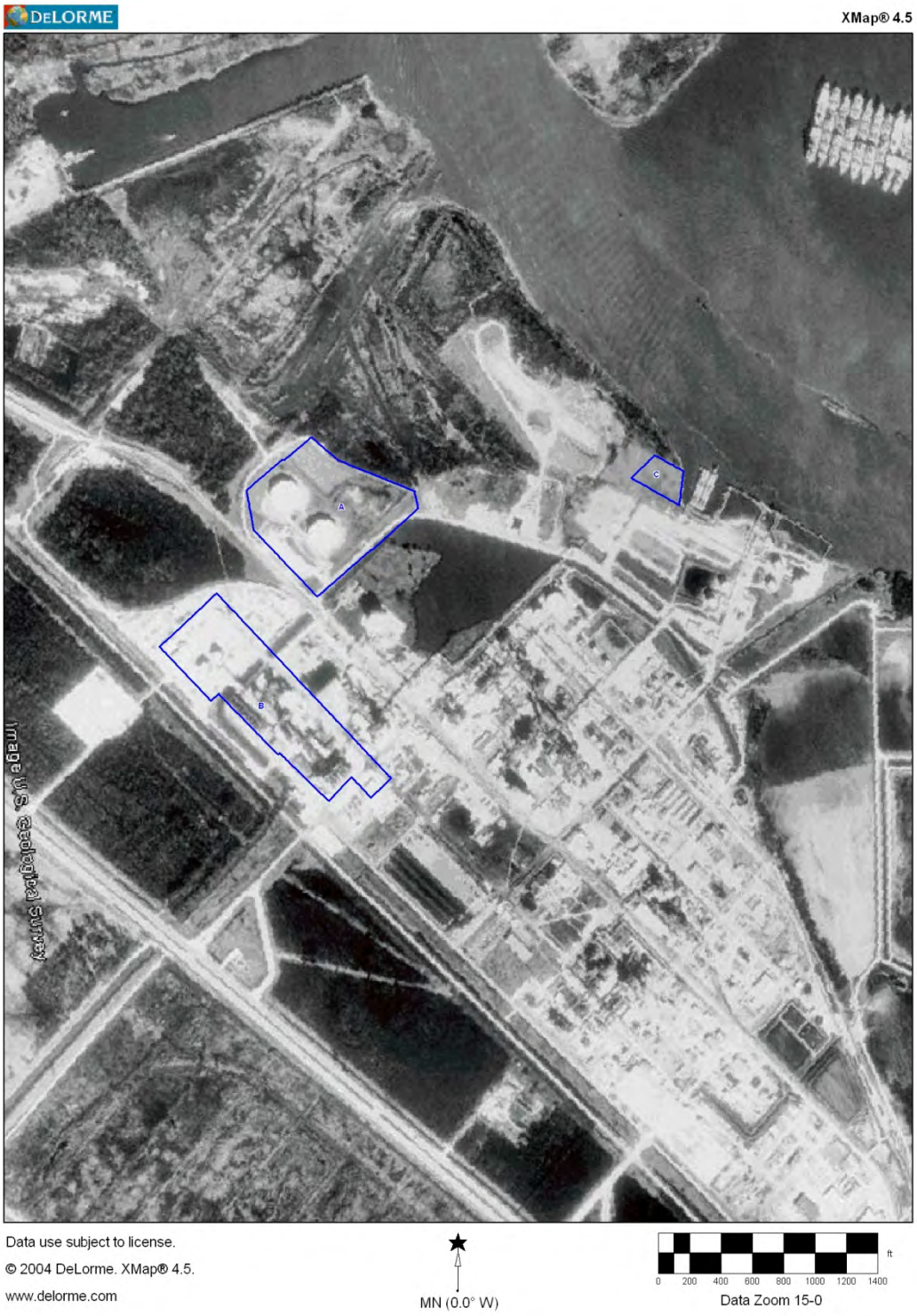


Figure 19. 1995 aerial photograph (Beaumont East Quadrangle USGS) overlain with Project Area boundaries.

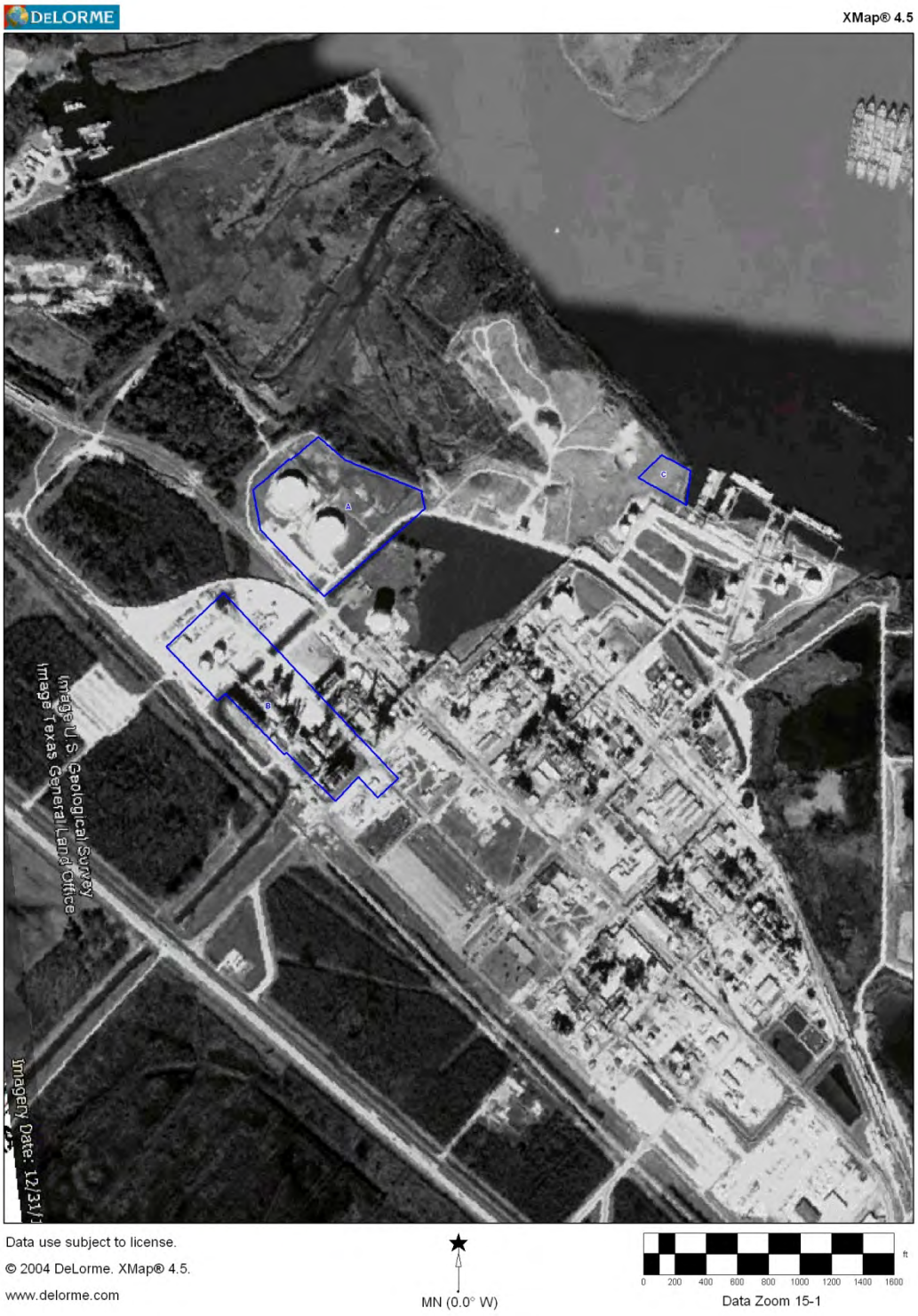


Figure 20. 1998 aerial photograph (Beaumont East Quadrangle USGS) overlain with Project Area boundaries.

APPENDIX B
Desk-Based Assessment

Moore Archeological Consulting, Inc.

3511 Houston Avenue Suite B
Houston, Texas 77009
www.moore-archeological.com

Office (713) 861-8663
Laboratory (713) 861-2323
Fax (713) 861-8627

June 22, 2012

Dan W. Parrish
Air Program Manager
Wolf Environmental LLC
121 E. Magnolia, Ste. 204
Friendswood, Texas 77546

Re: Archeological Assessment Letter for the OCI Beaumont LLC Methanol and Ammonia Plant, Jefferson County, Texas (MAC PN 12-33).

Mr. Parrish,

We have examined the map plotting for the above referenced project per your request. The subject property has been reviewed with reference to the State of Texas archeological site files, soil classifications, topography, and possible tract disturbances. These data were then compared to an existing site location predictive model (Moore 1996) for prehistoric sites in the region as well as additional MAC GIS databases.

Location

The project includes three separate tracts within an existing methanol production plant located southeast of Beaumont, in Jefferson County, Texas. The project area is depicted on the Beaumont East, Texas, 7.5' USGS topographic quadrangle map (Figure 1). The project areas comprise portions of a large industrial/refinery plant located along the southwestern shoreline of the McFadden Bend Cutoff of the Nueces River. The three distinct project tracts (Figure 2) consist of a 12.8-acre pad containing two large methanol storage tanks (Area A), a long, rectangular 13.5-acre tract housing various equipment, piping, and structures related to processing tasks (Area B), and a roughly rectangular, 1.5-acre pad containing one large ammonia storage tank (Area C). The proposed project consists of the renovation and reactivation of existing infrastructure, and does not include substantial new construction impacts or ground surface disturbances.

Previously Identified Cultural Resources

A review of site records at the Texas Archeological Research Laboratory (TARL) at the University of Texas at Austin was conducted by the TARL staff. The review indicated that there are no previously recorded prehistoric or historical sites within or immediately adjacent (½ km) to the proposed project area. A previous linear archeological survey conducted for the U.S. Army Corps of Engineers by SWCA in 2009 passed along the western edge of Area A, but failed to identify any cultural resources within the surveyed alignment. The closest identified archeological sites consist of three prehistoric shell midden sites, 41JF5, 41OR2, 41OR13, which are located on the banks of the original Nueces River channel. Though no chronologically diagnostic projectile points were recovered from these sites, the presence of pottery sherds indicate that all three date to at least the Early-Late

Ceramic period (A.D. 400-1750). The closest of these sites, 41OR2, is located 1.25 km northeast of the current project (Area C).

Potential for Cultural Resources

The project area was also assessed with respect to the following hierarchy of environmental factors that combine to make a locality attractive for prehistoric settlement within the region. The factors in combination constitute a set of settlement rules that define good locations for prehistoric campsites (Moore 1996). These include preferences for the following:

(1) Site locations in forested environments.

(2) Site locations in the floodplain or on the floodplain/upland margin.

(3) Site locations in proximity to sources of potable water.

(4) Site locations on well-drained, loamy soils.

(5) Site locations on topographic high points.

(6) Site locations on geologic terraces in watersheds with broad 100-year floodplains. These terraces may range from 100-1000 meters in width and may be of Late Pleistocene age or younger. They thus present good settings for the discovery of cultural remains as much as 10,000-12,000 years old.

(7) Site locations on the upland/floodplain margin typified by the Lissie and Beaumont slopes to streams with broad floodplains. As geologically old surfaces, these upland margins also present potentially good settings for prehistoric remains.

The proposed project area is depicted on sheet 20 of the Soil Survey of Jefferson County, Texas (Crout et al. 1965). Three types of soil occur within the project tracts, Acadia silt loam, 1 to 5 percent loam (AcB), Crowley silt loam (Ct), Made land (Ma). The entirety of Area A and the western two-thirds of Area B are mantled by Crowley silt loam soils, which are described as poorly drained, with slow surface runoff and very slow internal drainage. The eastern third of Area B is composed of Acadia silt loam, which is described as poorly drained with slow to rapid runoff and slow internal drainage. The poor drainage characteristics of these soils, suggest these areas would not have been preferred locations for prehistoric occupation sites (which tend to occur more often on sandy, well-drained soils). Area C is in an area identified as Made land, which is described as consisting of sediments "excavated from canals, ditches, or waterways, and deposited on other soils" (Crout et al. 1965:12). Most Made land is located in areas that were previously marshlands, and thus represents low probability areas for prehistoric occupations sites.

The association with sources of water has been demonstrated to be a dominant factor affecting the probability of prehistoric sites in southeast Texas. Most sites within the region are found within 300 m of a current or former source of natural potable water. The current project area is located on the south bank of the modern Nueces River at the McFadden Tuning Basin (previously known as the Beaumont Reserve Fleet Basin). However, the current channel is an artificially constructed 'cut-off' of a large bend in the natural stream course, and thus does not represent the original channel location. The presence of three prehistoric shell middens on the bank of the original channel indicates the Nueces River has been stable since at least the Ceramic period. A review of curated USGS maps and

Google Earth aerials reveals that in 1938, the basin and new channel were still marshlands, but that the new channel had been constructed by the early 1940s.

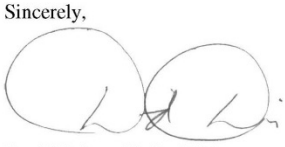
In terms of potential historic resources, a review of curated USGS topographic maps indicates that area has had little impact from development (other than the current route of the Kansas City Southern Railroad) until industrial development in the late1960s-early 1970s.

Conclusions

In summary, no historic or prehistoric archeological sites have been documented within the project area. The project area does not appear to meet any of the criteria often associated with preferred locations for prehistoric settlement, nor has the area experienced much in the way of historic development. Extensive industrial development, including the creation of "Made land" in former marshland areas indicates a low probability for the existence or preservation of prehistoric cultural resources. Further, the current proposed project is primarily focused on already existing structures and facilities, with no new impacts to undisturbed ground surfaces. Subsequently, we conclude that the probability for encountering prehistoric or historic cultural resources within the three project areas is extremely low, and that no further archaeological investigation is justified.

Concurrence with these recommendations should be sought from the Archeology Division of the Texas Historical Commission prior to the beginning of any construction. Further, in the event that unanticipated archaeological deposits are encountered during construction, work should be halted immediately and the Archeology Division of the Texas Historical Commission should be contacted.

Sincerely,



David Driver, Ph.D., RPA
wdaviddriver@hotmail.com
Senior Staff Archaeologist

References Cited

Abbott, James T.
2001 *Houston Area Geoarcheology; A Framework for Archeological Investigation, Interpretation, and Cultural Resource Management in the Houston Highway District.* Texas Department of Transportation, Environmental Affairs Division, Archeological Studies Program, Report 27.

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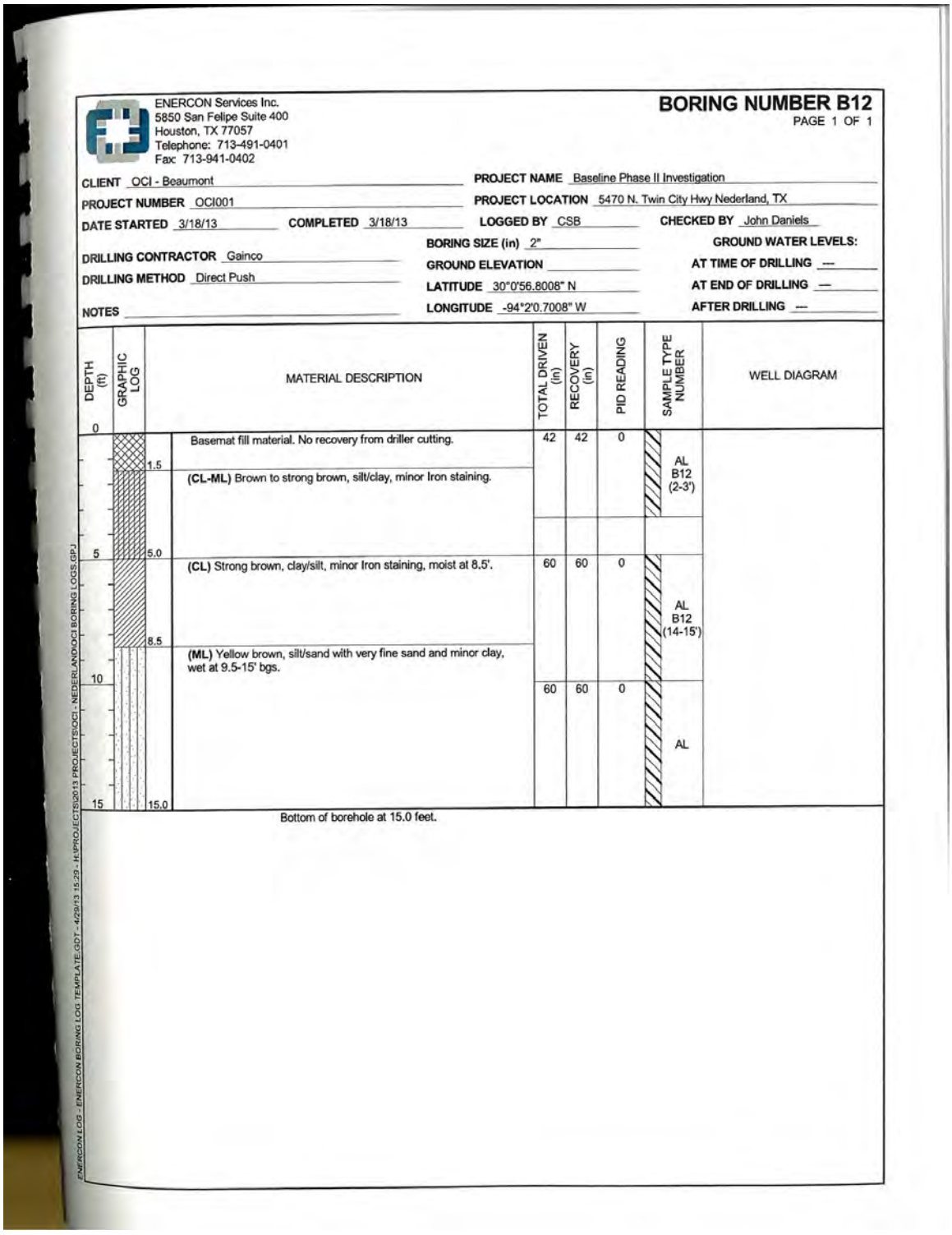
Moore, Roger G.
1996 *An Empirical Analysis of Elements of Prehistoric Site Location and Formation in Harris County, Texas.* Report of Investigations No. 149. Moore Archeological Consulting, Inc., Houston.

APPENDIX C
Borehole Logs



ENERCON Services Inc.
5850 San Felipe Suite 400
Houston, TX 77057
Telephone: 713-491-0401
Fax: 713-941-0402

BORING NUMBER B12

PAGE 1 OF 1

CLIENT OCI - Beaumont
PROJECT NAME Baseline Phase II Investigation
PROJECT NUMBER OCI001
PROJECT LOCATION 5470 N. Twin City Hwy Nederland, TX
DATE STARTED 3/18/13 COMPLETED 3/18/13
LOGGED BY CSB CHECKED BY John Daniels
DRILLING CONTRACTOR Gainco
BORING SIZE (in) 2"
GROUND WATER LEVELS:
DRILLING METHOD Direct Push
GROUND ELEVATION
AT TIME OF DRILLING ---
LATITUDE 30°0'56.8008" N
AT END OF DRILLING ---
NOTES
LONGITUDE -94°2'0.7008" W
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL DRIVEN (in)	RECOVERY (in)	PID READING	SAMPLE TYPE NUMBER	WELL DIAGRAM
0		Basemat fill material. No recovery from driller cutting.	42	42	0	AL B12 (2-3')	
1.5		(CL-ML) Brown to strong brown, silt/clay, minor Iron staining.					
5							
5.0		(CL) Strong brown, clay/silt, minor Iron staining, moist at 8.5'.	60	60	0	AL B12 (14-15')	
8.5		(ML) Yellow brown, silt/sand with very fine sand and minor clay, wet at 9.5-15' bgs.					
10			60	60	0	AL	
15							
15.0		Bottom of borehole at 15.0 feet.					

ENERCON LOG - ENERCON BORING LOG TEMPLATE.GDT - 4/29/13 15:29 - H:\PROJECTS\2013 PROJECTS\OCI - NEDERLAND\OCI BORING LOGS.GPJ

ENERCON Services Inc.
5850 San Felipe Suite 400
Houston, TX 77057
Telephone: 713-491-0401
Fax: 713-941-0402

BORING NUMBER B13

CLIENT OCI - Beaumont
PROJECT NAME Baseline Phase II Investigation
PROJECT NUMBER OCI001
PROJECT LOCATION 5470 N. Twin City Hwy Nederland, TX
DATE STARTED 3/18/13 **COMPLETED** 3/18/13
LOGGED BY CSB **CHECKED BY** John Daniels
DRILLING CONTRACTOR Gainco
BORING SIZE (in) 2"
GROUND WATER LEVELS:
DRILLING METHOD Direct Push
GROUND ELEVATION
AT TIME OF DRILLING ---
LATITUDE 30°0'54.3996" N
AT END OF DRILLING 10.25 ft
NOTES
LONGITUDE -91°4'59.9016" W
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	TOTAL DRIVEN (in)	RECOVERY (in)	PID READING	SAMPLE TYPE NUMBER	WELL DIAGRAM
0							Casing Type: PVC
		No Recovery from 0-4' bgs.	12	12	0	AL B13 (4-5')	
4.0							
5		(CL-ML) Brown to strong brown, silt/clay, minor Iron staining. 5.0					
		(CL) Strong brown, clay/silt, minor Iron staining, moist at 8.5'.	60	60	0	AL B13 (14-15')	
10		10.0					
		(ML) Yellow brown, silt/sand with very fine sand and minor clay, wet at 10' bgs.	60	60	0	AL	
15		15.0					

Bottom of borehole at 15.0 feet.

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APPENDIX D

Curriculum Vitae of Principal Investigator

W. DAVID DRIVER, Ph.D., RPA

Curriculum Vitae 2014

Technical and Theoretical Specialties:
Architecture and civic space; Social identity and material culture style; Maya archeology; Excavation methods and instruction; Cultural resource management (historic & prehistoric); Underwater archeology; Ground penetrating radar (GPR); Human burials and osteology; Technical drawing; Field mapping (optical transit & total station); Writing, editing, and preparation of reports.

Education:
B.A. Anthropology, Texas State University, San Marcos, Texas 1987
Minor: History

M.A. Anthropology, The University of Texas at Austin 1991
Thesis title: Excavations and Architecture at Chac Balam, Belize. Chair: Fred Valdez, Ph.D.

Ph.D. Anthropology, Southern Illinois University at Carbondale 2008
Dissertation title: The Construction of Intrapolity Sociopolitical Identity through Architecture at the Ancient Maya Site of Blue Creek, Belize. Chair: Don S. Rice, Ph.D.

Teaching Experience
2005-Present Adjunct Faculty
ANTH 2301: Physical Anthropology.
ANTH 2302: Introduction to Archeology
ANTH 2351: Cultural Anthropology.
Social Science and Teacher Education Department, Houston Community College-Southeast Campus, Houston, Texas. Department Chair: Cammy Shay, Ph.D.

Spring 2003 University Instructor
Anthropology 202: America's Diverse Cultures.
Department of Anthropology, Southern Illinois University, Carbondale, Illinois.

Fall 2002 University Instructor
Anthropology 104: The Human Experience.
Department of Anthropology, Southern Illinois University, Carbondale, Illinois.

Fall 2000 Teaching Assistant
Anthropology 104: The Human Experience.
Department of Anthropology, Southern Illinois University, Carbondale, Illinois.

1998-1999 University Instructor
Anthropology 202: Diversity of American Cultures.
Department of Anthropology, Southern Illinois University, Carbondale, Illinois.

1997-1998 Teaching Assistant
Anthropology 202: Diversity of American Cultures.
Dr. Jane Adams, Department Of Anthropology, Southern Illinois University, Carbondale, Illinois.

1991-1993 University Instructor
Session I, Summer School, SWTSU Archeological Field School.
Department of Anthropology, Southwest Texas State University, San Marcos, Texas.

1988-1989 Graduate Student Assistant
Department of Anthropology, The University of Texas at Austin.
Asst. to Dr. Fred Valdez (Archeology) and T.A. for John DeMoss (Physical Anthropology)

1985-1987 Undergraduate Student Assistant
Department of Sociology and Anthropology, Southwest Texas State University.
Asst. to Drs. James Garber (Archeology) & David Glassman (Physical Anthropology).

Supplemental Training:

2002 Reading and Responding to Student Writing: A Workshop
Conducted by Dr. Lisa J. McClure, Director of Writing Studies and Associate Professor, Department of English, Southern Illinois University, Carbondale

2006 Dialog: Racism
The Center for the Healing of Racism, Houston, Texas
Workshop conducted by Cherry Steinwender

2009 Certificate in Instructional Technology (CIT) Program
Professional development program designed to prepare faculty to integrate instructional technologies into their teaching practices. The certificate requires forty (40) hours of classroom instruction. Houston Community College System, Houston, Texas

2009 Teaching and Learning Excellence (TLE) Certificate Program
Professional development program for the enhancement of faculty competencies in both traditional and contemporary strategies of instruction and learning. The certificate requires forty (40) hours of classroom instruction. See Appendix 2. Houston Community College System, Houston, Texas

Publications:

1994 Driver, W. D.
Ground Penetrating Radar Investigations in the Search for the San Elizario Presidio, El Paso County, Texas. The Artifact 32(1):23-28.

1995 Driver, W. D.
Chac Balam: Excavations and Architecture of a Formal Plazuela Group. M.A. thesis published in Maya Maritime Trade, Settlement, and Populations on Ambergris Caye, Belize, edited by T. H. Guderjan and J. F. Garber, pp. 43-65. Labyrinthos, Lancaster, California.

1995 Driver, W. D.
The Cochran Farm Site (41GZ2): A Summary of the 1992 Archeological Testing Project. La Tierra 22(3):38-46.

1998 Garber, J. F., W. D. Driver, L. A. Sullivan, and D. M. Glassman
Bloody Bowls and Broken Pots: The Life, Death, and Rebirth of a Maya House. In The Sowing and the Dawning: Termination, Dedication, and Transformation in the Archeological and Ethnographic Record of Mesoamerica, edited by S. Mock, pp. 125-133. University of New Mexico Press, Albuquerque.

2002 Driver, W. D.
An Early Classic Colonnaded Building at the Maya Site of Blue Creek, Belize. Latin American Antiquity 13(1):63-84.

2002 Driver, W. D., and P. Wanyerka
Creation Symbolism in the Architecture and Ritual at Structure 3, Blue Creek, Belize. Mexicon XXIV(1):6-8.

2003 Driver, W. D., and J. F. Garber
The Emergence of Minor Centers in the Zones Between Seats of Power. In The Ancient Maya of the Belize Valley: Half a Century of Archeological Research, edited by J. F. Garber, pp. 287-304. University Press of Florida, Gainsville.

2003 Garber, J. F., M. K Brown, W. D. Driver, D. M. Glassman, C. J. Hartman, F. K. Reilly, III, L. A. Sullivan
Archeological Investigations at Blackman Eddy. In The Ancient Maya of the Belize Valley: Half a Century of Archeological Research, edited by J. F. Garber, pp. 48-69. University Press of Florida, Gainsville.

2005 Clayton, S. C., W. D. Driver, and L. J. Kosakowsky
Rubbish or Ritual? Contextualizing a Terminal Classic Problematical Deposit at Blue Creek, Belize. A Response to "Public Architecture, Ritual, and Temporal Dynamics at the Maya Center of Blue Creek, Belize" by Thomas H. Guderjan. Ancient Mesoamerica 16(2):119-130.

in press Driver, W. D., and L. J. Kosakowsky
Transforming Identities and Shifting Goods: Tracking Sociopolitical Change through the Monumental Architecture and Ceramic Assemblages at Blue Creek, Northwestern Belize. In Classic Maya Political Ecology: Resource Management, Class Histories, and Political Change in Northwestern Belize, edited by Jon C. Lohse. Cotsen Institute of Archeology Press, Los Angeles.

Presented Papers:

1991 Garber, J. F., W. D. Driver, L. A. Sullivan, and D. M. Glassman
Excavations at the Maya Site of Blackman Eddy in the Belize Valley, Belize: Results of the 1990 Field Season. Paper presented at the 56th Annual Meeting of the Society for American Archeology, New Orleans.

1992 Driver, W. D., J. F. Garber, L. A. Sullivan, and D. M. Glassman
Ritual Activity at the Site of Blackman Eddy, Belize. Paper presented at the 57th Annual Meeting of the Society for American Archeology, Pittsburgh.

1992 Driver, W. D.
The Excavations at the Maya Site of Chac Balam, Ambergris Cay, Belize. Paper presented at the 63rd Annual Meeting of the Texas Archeological Society, Corpus Christi, Texas.

1993 Garber, J. F., W. D. Driver, and L. A. Sullivan
Medium Sized Ceremonial Centers in the Belize Valley: The Blackman Eddy Example. Paper presented at the 58th Annual Meeting of the Society for American Archeology, St. Louis.

1994 Driver, W. D.
Geophysical Prospection and Archeological Survey in the Lower Valley of El Paso, Texas. Paper presented at the Society for Historical Archeology, Vancouver.

1996 Driver, W. D.
Structure as Narrative: Monitoring Social Change Through Architecture at the Maya Site of Blue Creek, Belize. Paper presented at the 61st Annual Meeting of the Society for American Archeology, New Orleans.

1998 Garber, J. F., W. D. Driver, M. K. Brown, and J. K. McWilliams
Betwixt and Between: Minor Ceremonial Centers in the Belize Valley. Paper presented at the 63rd Annual Meeting of the Society for American Archeology, Seattle.

1999 Driver, W. D.
Stability and Change: Architectural Clues for Socio-Political Transitions. Paper presented at the 64th Annual Meeting of the Society for American Archeology, Chicago.

2001 Driver, W. D.
Ritual Architecture and Activity at the Maya Site of Blue Creek, Belize: The Creation, Modification, and Termination of a Possible Hearthstone Stairway Shrine. Paper presented at the 66th Annual Meeting of the Society for American Archeology, New Orleans.

2002 Clayton, S. C., L. J. Kosakowsky, and W. D. Driver
Rubbish or Ritual? Contextualizing a Problematical Deposit from the Maya Site of Blue Creek, Belize. Paper presented at the 67th Annual Meeting of the Society for American Archeology, Denver.

2006 Kosakowsky, L. J., and W. D. Driver
Transforming Identities and Shifting Goods: Tracking Sociopolitical Change through the Monumental Architecture and Ceramic Assemblages at the Maya Site of Blue Creek in Northwestern Belize. Paper presented at the 71st Annual Meeting of the Society for American Archeology, San Juan, Puerto Rico.

2010 Driver , W. D.
Building Boundaries: Ancient Maya Architectural Design and the Construction of Social Identity. Paper presented at the 75th Annual Meeting of the Society for American Archeology, St. Louis, Missouri.

Honors/Awards:
Field School Grant, South Texas Archeological Association (STAA), 1985.
Doctoral Graduate Fellowship Award, Southern Illinois University at Carbondale, 1999-2000 School Year.
Doctoral Graduate Fellowship Award, Southern Illinois University at Carbondale, 2001-2002 School Year.

Professional/Technical Societies:
Society for American Archeology (SAA)
American Anthropological Society (AAA)
Register of Professional Archaeologists (RPA)
Society for Historical Archeology (SHA)
Council of Texas Archeologists (CTA)
Texas Archeological Society (TAS)
Sigma Xi
The Explorers Club
P.A.D.I. Specialty Diver Certification: Underwater Archeology
Southwest Underwater Archeology Society
UT Anthropology Society, Newsletter Co-editor, Bull Roarer, 1989-1990
SWTSU Anthropology Society, Vice President, 1985

Military Experience:
U.S. Marine Corps (Reserve) 1980-1984.
Bravo Company, 1st Battalion, 23rd Marine Regiment, 4th Marine Division (MOS 0311-Infantry).
Final Rank- Sergeant (E-5), primary duties: infantry squad leader
Awards: Marine of the Year, 1981, Bravo Company
Meritorious Mast Award- 23 May, 1982
Meritorious Mast Award- 14 August, 1983

Archeological Fieldwork: U.S.A., Belize, Saudi Arabia

TEXAS & CALIFORNIA, GEORGIA, INDIANA, LOUISIANA, NEW MEXICO

2003- Staff Archaeologist, Moore Archeological Consulting, Inc.
Present Principle Investigator, Cultural Resource Management report production, Houston, Texas.
Owner: Dr. Roger G. Moore

2001 Project Archaeologist, Farmersburg Mine Dragline Movement Corridor Project. Pedestrian Survey for Cultural Resources; Black Beauty Coal Mine, Vigo County, Indiana. American Resources Group, Ltd., Carbondale, Illinois.

1996 Project Archaeologist, Southern Matagorda Bay Underwater Archeological Reconnaissance and Mapping Project. Side-scanning sonar survey for the shipwreck, the Oaxaca. Southwest Underwater Archeology Society & Texas Historic Commission, Austin, Texas.

1996 Project Archaeologist, Ennis Joslin Road Expansion Project.
Testing of Archaic-Late Prehistoric Cemetery (41NU2); Corpus Christi, Texas.
Directed by Dr. Robert Ricklis, Coastal Archeological Research, Inc., Corpus Christi, Texas.

1996 Principal Investigator, Olmos Creek Channelization Project.
Testing and excavation of Archaic site, 41BX1152; San Antonio, Bexar County, Texas.
Texas Archeological Research Laboratory, University of Texas at Austin.

1995 Excavator, Lake Gilmer Data Recovery Project.
Excavation of Caddoan sites; Gilmer, Upshire County, Texas.
Project Director: Dr. Peter Nichols, Horizon Environmental Services, Inc., Austin, Texas.

1995 Project Archaeologist , Olmos Dam Wastewater Line Project
Monitoring of sewage line replacement, Olmos Park, Bexar County, Texas.
Guderjan & Assoc./St. Mary's University. San Antonio, Texas.

1995 Project Archaeologist, Birch Pipeline Connection Survey Project.
Pedestrian Survey for Cultural Resources; Lake Fork Reservoir, Wood County, Texas.
Texas Archeological Research Laboratory, University of Texas at Austin.

1993-1994 Co-Project Archaeologist & Ground Penetrating Radar Operator, El Paso Lower Valley Archeological Project.
1) Test excavation of 17th-18th century Historic sites; Socorro, El Paso County, Texas.
2) Archeological survey in Redwood National Park, California
3) Archeology Awareness Week- excavations of Mogollon site in the Gila National Forest, New Mexico
Project Directors: Drs. John Peterson & David Brown, Archeological Research, Inc., El Paso, Texas.

1993 Ground Penetrating Radar Operator, San Saba Mission Project.
Remote sensing survey for 18th cent. Spanish Mission; Menard, Menard County, Texas.
Project Director: Dr. Grant Hall, Texas Tech University, Lubbock, Texas.

1993 Field Technician, 7th Street HUD Renovation Project.
Documentation (measured drawings and photography) of various architectural properties; Austin, Travis County, Texas.
Hicks & Company, Austin, Texas.

1992-1993 Staff Archaeologist, Cultural Resource Management.
Position included report writing and illustrations, GPR survey, archeological survey and excavation.
Hicks & Company, Austin, Texas.

1992 Project Archaeologist, University Instructor, Texas Archeological Field School, Summer I.
Excavation of prehistoric site, 41GZ2 (Cochran Farm); Luling, Gonzales County, Texas.
Dept. of Anthropology, Southwest Texas State University, San Marcos, Texas.

1991, 1993 Project Archaeologist, University Instructor, Texas Archeological Field School, Summer I.
Excavation of Paleoindian-Late Prehistoric site, 41HY160 (Aquarena Springs); San Marcos, Hays County, Texas.
Dept. of Anthropology, Southwest Texas State University, San Marcos, Texas.

1990 Excavator, Austin Convention Center Project.
Excavation of 19th-20th century Historic sites (41TV1493-1497), Austin, Travis County, Texas.
Project Director: David Brown, Hicks & Company, Austin, Texas.

1989 Excavator, Buda Highway Project.
Excavation of Archaic-Late Prehistoric sites; Buda, Hays County, Texas.
Project Directors: Dr. Michael Collins and Mike Quigg, Texas Archeological Research Laboratory, University of Texas at Austin.

1989 Excavator, Zilker Park Archeological Project.
Test excavations of Paleoindian-Late Prehistoric site, 41TV1364 (Vera Daniel); Zilker Park, Austin, Travis County, Texas.
Project Directors: Dr. Michael Collins and Robert Ricklis, Texas Archeological Research Laboratory, University of Texas at Austin.

1988 Crew Member, TUMCO (Texas Utilities Mining Co.) Monticello B-2 Extension Archeological Survey Project.
Pedestrian survey for cultural resources; Mount Pleasant, Titus County, Texas.
Project Director: Wayne Glander, Espey, Huston & Associates, Inc., Austin, Texas.

1987 Crew Member, Bonnet Carré and Ft. Benning MITA (Mechanized Infantry Training Area)
Archeological Survey Projects.
Pedestrian survey for cultural resources; New Orleans, Louisiana, and Columbus, Georgia.
Project Director: Dr. Eric Poplin, R. Christopher Goodwin and Associates, Inc., New Orleans, Louisiana.

1985 Diver/Excavator, Spring Lake Archeological Project.
Underwater excavations of Paleoindian site, 41HY147 (Spring Lake site); Aquarena Springs. San Marcos, Hays County, Texas.
P.A.D.I. Specialty Diver Certification: Underwater Archeology
Project Director: Dr. Joel Shiner, Southern Methodist University.

1985 Student Excavator, Archeological Field School, Summer I & II.
Excavation of a Archaic-Late Prehistoric site, 41HY163 (Zatopec site); San Marcos, Hays County, Texas.
Project Director: Dr. James Garber, Southwest Texas State University.

BELIZE

1994-2001, Staff Archaeologist & Field Director, Blue Creek Archeological Project.

2003 Excavations at the ancient Maya center of Blue Creek, Orange Walk District, Belize. Maya Research Program and St. Mary's University/Texas Christian University. Project Directors: Drs. Thomas Guderjan and Jon C. Lohse

1990-1994 Field Director, Belize Valley Archeological Project.
Excavation of Maya centers, Blackman Eddy and Ontario Village; Cayo District, Belize.
Project Directors: Drs. James Garber and David Glassman, Southwest Texas State University, San Marcos,Texas.

1991 Operation Director, Caracol Archeological Project.
Excavation of Maya center, Caracol; Cayo District, Belize.
Project Directors: Drs. Arlen and Diane Chase, University of Central Florida, Orlando, Florida.

1989 Crew Director, Colha Middle Preclassic Project.
Excavation of Maya center, Colha; Orange Walk District, Belize.
Project Directors: Dr. Fred Valdez, University of Texas, Austin; and Dr. James Garber, Southwest Texas State University.

1989 Diver, Drowned Cayes Underwater Archeological Survey Project.
Magnetometer survey for wrecks resulting from the Hurricane of 1787; Gallows Point, Belize District, Belize. Project Director: Jack Irion, University of Texas at Austin.

1987-1988 Assistant Field Director and Operation Director, Northern Ambergris Archeological Project.
Excavation of Maya sites, Chac Balam, Ek Luum, Laguna de Cayo Francesa; Ambergris Caye, Belize.
Project Directors: Dr. James Garber, Southwest Texas State University; Dr. Herman Smith, Corpus Christi Museum; and Thomas Guderjan, Southern Methodist University.

1986 Assistant Field Director and Crew Chief, San Juan Project.
Excavation of Maya site, San Juan; Ambergris Caye, Belize.
Project Director: Dr. James Garber, Southwest Texas State University; Dr. Herman Smith, Corpus Christi Museum; and Thomas Guderjan, Southern Methodist University.

SAUDI ARABIA

1985 Excavator, Doumat al Jandahl Classical Archeology Project.
Excavation of Nabatean tombs, house foundation, and city defense walls; Doumat al Jandahl, Saudi Arabia.
Project Director: Khalid al Dayel, Saudi Arabian Department of Antiquities.