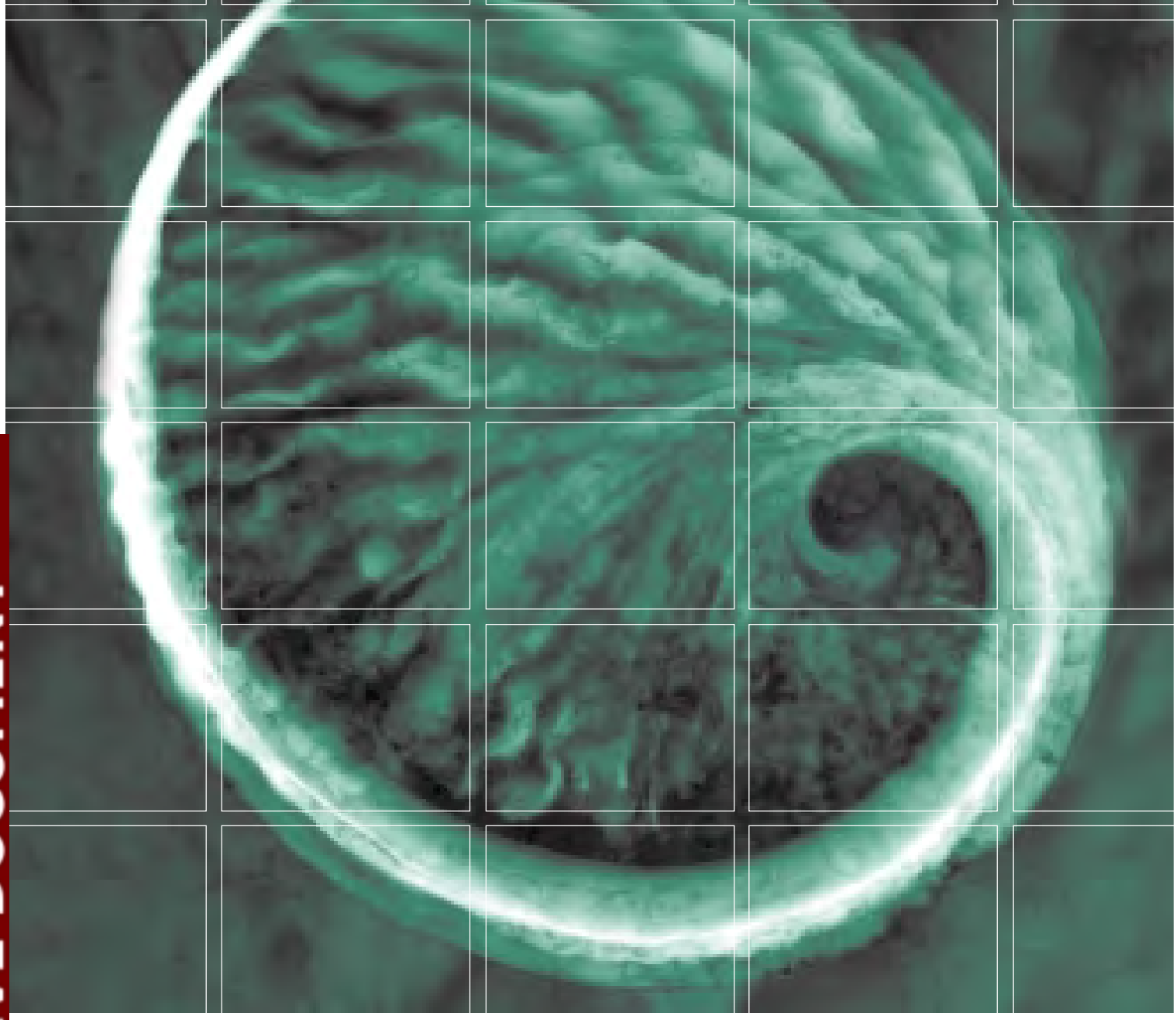
Report for the Finding of No Effect to
Archeological and Historic Resources
Associated with Air Liquide's
Bayou Cogeneration Plant's Proposed Project:
Pasadena, Harris County, Texas



Cultural Resources Assessment (CRA) Report

Air Liquide
Bayou Cogeneration Plant
Pasadena, Texas

October 25, 2013

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ERM

Air Liquide

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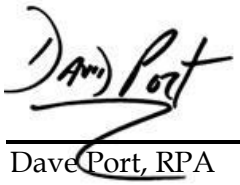

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ACRONYM GLOSSARY

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
CAA	Clean Air Act
CLEC	Closed Loop Emissions Control
CO	Carbon Monoxide
CRA	Cultural Resources Assessment
EPA	Environmental Protection Agency
ERM	Environmental Resources Management, Inc.
GE	General Electric
GHG	Greenhouse Gases
HRSG	Heat Recovery Steam Generator
NHPA	National Historic Preservation Act
NNSR	Nonattainment New Source Review
NOX	Nitrogen Oxides
NRHP	National Register of Historic Places
NSR	New Source Review
PBR	Permits-by-Rule
PM	Particulate Matter
PSD	Prevention of Significant Deterioration
ROW	Right-of-Way
SCR	Selective Catalytic Reduction
SHPO	State Historic Preservation Officer
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
VOC	Volatile Organic Compounds

Environmental Resources Management, Inc. (ERM) completed a Cultural Resources Assessment (CRA) and project impact effects determination for *Air Liquide*'s Bayou Cogeneration Plant located in Harris County, Texas. Air Liquide Large Industries U.S., L.P. (*Air Liquide*) is seeking a Greenhouse Gas (GHG) permit under the Environmental Protection Agency's (EPA) Prevention of Significant Deterioration (PSD) program of the Clean Air Act (CAA), which would authorize the redevelopment of its cogeneration facility on Bay Area Boulevard in Pasadena, Texas. The proposed project is on private land and will involve the replacement of four (4) gas-fired turbines (GT1 through GT4) with similar units, the addition of three (3) new gas-fired boilers (BO1 through BO3), and the subsequent removal of three (3) existing gas-fired boilers (B-305 through B-307) at the Bayou Cogeneration Plant. No new construction activities (e.g., ground disturbances, excavations, etc.) are anticipated. In addition, no new linear facilities (e.g., pipelines, transmission lines, water lines, etc.) and no new infrastructure improvements (e.g., roads, support buildings, etc.) within or adjacent to the Project Site are planned for the proposed modifications. Because the Project would require a permit from the EPA, the Project is subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended.

Both archival as well as background site file research at the Texas Historical Commission (THC) and a pedestrian field reconnaissance survey were conducted to evaluate the potential for and the occurrence of cultural resources within and immediately adjacent to the Project Site. No cultural resources were identified within the Project Site or within one (1) kilometer (km) of the Project Site's viewshed through ERM's research and field survey efforts. The Project will have ***no effect*** on cultural resources within and adjacent to the Project Site as defined in 36 CFR 800.4(d)(1). Based on the lack of archeological deposits and historic properties within and adjacent to the Project Site as well as the absence of historic properties either listed on or eligible for inclusion to the National Register of Historic Places (NRHP), ERM recommends that the proposed project be allowed to proceed as planned without additional cultural resources investigations.

1.0 INTRODUCTION

Air Liquide Large Industries U.S., L.P. (*Air Liquide*) is submitting a permit application to authorize the redevelopment of its cogeneration facility in Pasadena, Texas (Bayou Cogeneration Plant), see Appendix A: Project Survey Maps. The proposed project will involve the replacement of four (4) gas-fired turbines (GT1 through GT4) with similar units, the addition of three (3) new gas-fired boilers (BO1 through BO3), and the subsequent removal of three (3) existing gas-fired boilers (B-305 through B-307) at the Bayou Cogeneration Plant. The existing turbines and boilers at the facility are nearing end of life, and this project will ensure that the existing units are replaced by more efficient state of the art units. Overall, this project will result in a net reduction of Nitrogen Oxide (NOX) emissions from the Bayou Cogeneration plant.

Beginning on January 2, 2011, the U.S. Environmental Protection Agency (the EPA) began permitting greenhouse gases (GHGs) through the Prevention of Significant Deterioration (PSD) program of the Clean Air Act (the CAA). Most states directly issue GHG PSD permits, but EPA currently retains authority to issue GHG permits in Texas. Because the EPA retains authority to issue PSD permits, the requirements of Section 106 of the NHPA of 1966, as amended, become part of the PSD permitting process.

Section 106 of the NHPA requires federal agencies to take into consideration the effects of their undertakings (including licensing and permitting actions) on historic properties (cultural resources listed on or eligible for listing on the National Register of Historic Places [NRHP]). Section 106 of the NHPA and its implementing regulations at 36 CFR Part 800 as administered by the Advisory Council on Historic Preservation (ACHP) lay out procedures that ensure historic properties are considered in federal planning and/or permitting processes. Additionally, Section 106 of the NHPA requires federal agencies with the authority to license a project to take into account the effects of the project on historic properties and also to afford the ACHP a reasonable opportunity to comment.

Because *Air Liquide* is seeking authorization for GHG permitting under PSD for the Bayou Cogeneration Plant, they are required to meet the NHPA requirements administered by the EPA. ERM's CRA provides the results of an evaluation of potential effects of the proposed action on cultural resources listed on or eligible for listing on the NRHP as well as other historic properties within or adjacent to the Area of Potential Effect (APE).

The proposed APE is one of the first steps in EPA's evaluation under Section 106 of the NHPA. The EPA determines the APE for indirect effects (visual impacts, noise/vibration, and air emissions containing hazardous constituents). As defined in 36 CFR 800.4(a)(1) and 36 CFR 800.16(d), the APE of an undertaking is "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." Indirect effects are those "caused by an action and are later in

time or farther removed in distance but are still reasonably foreseeable" (40 CFR 1508.8). According to the Texas Historical Commission (THC) State Historic Preservation Officer's (SHPO) *Section 106 Regulations Users Guide*, the APE includes "all areas of construction, demolition, and ground disturbance (direct effects) and the broader surrounding area that might experience visual or other effects from the project (indirect effects)"(THC: *The Section 106 Review Process* 2012).

The APE not only includes the immediate Project Site and its boundaries, which encompasses approximately 57 acres, but also cultural resources immediately adjacent to the Project Site and within a one (1) kilometer (km) (or 0.6 mile) radius of the project's viewshed. Given that the location of *Air Liquide's* Bayou Cogeneration Plant is within the middle of a battery of industrial complexes, built circa 1970s, combined with a generally low-visibility viewshed, a 1 km radius was proposed to be sufficient for assessing the project's indirect visual effects for the APE.

ERM's CRA is based on a review of the proposed project, relevant data, archival/background research, and field investigations to evaluate the Project Site and the surrounding area to determine what direct and/or indirect effects would occur on the cultural resources present within the proposed Project Site and its APE. The primary intent of the survey was to identify and describe all archeological resources and historic standing structures discovered within the Project Site, evaluate their eligibility for inclusion to the NRHP, and should significant archeological resources be located, make recommendations for management options, such as avoidance and preservation or for further investigations.

1.1 SITE LOCATION AND HISTORY

The Bayou Cogeneration Plant is located at 11400 Bay Area Blvd, Pasadena, Texas. The plant is in Harris County, which is part of the 8-county Houston-Galveston-Brazoria "severe" ozone non-attainment area.

The plant is comprised of approximately 57 acres bordered by industrial facilities on all four sides. Although there are scattered areas of undeveloped land adjacent to and in the approximate area, the plant is considered to be located in a highly industrialized area.

The plant has been in operation for over 27 years and consists of four (4) turbine power blocks for power and steam generation, with each block consisting of a gas-fired General Electric (GE) Frame 7EA turbine, and a heat recovery steam generator (HRSG) that includes duct burners for supplemental firing. The plant also consists of three (3) natural gas-fired boilers which produce steam for sale. The existing sources at the plant are currently permitted to operate under New Source Review (NSR) air permits, Prevention of Significant Deterioration (PSD) permits, one federal Title V operating permit, as well as various Texas Permits-by-Rule (PBRs).

1.2 PROJECT PURPOSE AND NEED

The redevelopment project at the Bayou Cogeneration Plant will consist of replacing the four existing gas turbines at the plant with similar new units. As such, only the gas turbines will be removed and replaced with new units; all existing connections of the power block, as well as the existing HRSGs and duct burners will remain unaffected by this project. No new linear facilities (e.g., pipelines, transmission lines, water lines, etc.) and no new infrastructure improvements (e.g., roads, support buildings, etc.) within or adjacent to the Project Site are planned for the proposed modifications.

The new units will be more efficient than the existing units which are nearing end of life. *Air Liquide* intended to perform an in-kind replacement of the four existing turbines; however, since the existing turbines are 27 years old, turbines with the exact same specifications are no longer available to *Air Liquide*. Therefore, *Air Liquide* will replace the existing turbines with new GE Frame 7EA gas turbines which are closest in specification to the existing turbines.

The new 7EA units will be equipped with dry, NOX burners and GE's closed loop emissions control (CLEC) technology to reduce NOX emissions. The redevelopment project will also include the addition of three new 550 MMBtu/hr boilers to the Bayou1 GT1 through GT4 refer to the gas turbines associated with EPNs CG801 through CG804. The duct burners and HRSGs associated with these EPNs are not being modified or replaced as part of this project. Units B-305 through B-307 refers to the gas-fired boilers with EPNs ST-5 through ST-7. Each new turbine is rated to produce 4 MW of electricity more than the existing turbines at the facility.

Air Liquide is proposing to establish an enforceable limitation of 10,769,647 MMBtu per year on the combined fuel heat input for the three new boilers. The new boilers will be controlled using Selective Catalytic Reduction (SCR) units for NOX emissions.

The proposed project will be executed in three phases, as summarized below, spanning 24 to 30 months:

PHASE 1 (ANTICIPATED JUNE 2013 – DECEMBER 2013)

During this phase, three new boilers will be constructed at the facility. These new boilers will eventually replace the three existing boilers during Phase 3 of the project. Each of the three new boilers will be equipped with SCR systems to reduce NOX emissions to the atmosphere. The existing turbines and boilers will not be modified during this phase of the project and will continue to operate at current levels; therefore, the only construction activity during this phase of the project will be the construction of the three new boilers.

PHASE 2 (ANTICIPATED DECEMBER 2013 – DECEMBER 2015)

During this phase, the four existing turbines will be replaced one at a time with new GE 7EA units designed with the latest and most efficient combustion technology. During Phase 2, the new boilers will need to be operational and available to fulfill steam/thermal supply contractual obligations, in addition to the three existing boilers. Each of the four turbines will be decommissioned, removed, and subsequently replaced one at a time. As soon as the replacement of a given turbine is complete during Phase 2, it will be started up and commissioned. Phase 2 will end as soon as the fourth turbine is started up and commissioned. The existing boilers will continue to be available for operation during this phase to assist in fulfilling the steam/thermal supply contractual obligations, however, at no point will four new turbines, three new boilers, and three existing boilers operate simultaneously during Phase 2. The potential emissions during this phase will not exceed the potential emissions from the overall project. Additionally, *Air Liquide* will operate the equipment such that all emissions during this phase are less than the respective permit limits.

PHASE 3 (ANTICIPATED DECEMBER 2015)

During this phase, the three existing boilers will be retired and permanently shut down. This marks the completion of the project, and the four replaced gas turbines and three new boilers will become operational after this phase.
As outlined above, the three new boilers constructed in Phase 1 of the project will eventually replace the three existing boilers at the facility in Phase 3; however, the existing boilers will only be decommissioned after the replacement of the turbines in Phase 2, so that the new as well as existing boilers are available during Phase 2 to meet the steam/thermal supply contractual obligations.

For the purposes of this study and how it pertains to the indirect effects on the project's viewshed, *Air Liquide* has not only evaluated the overall project from an NSR perspective (pre-project actual emissions to post project potential emissions), but has also independently evaluated Phase 2 of the project to ensure that pollutants that are not triggering PSD or Nonattainment New Source Review (NNSR) from an overall project standpoint are also not triggering PSD or NNSR for an individual phase of the project.

Based on emissions calculations, the proposed project will result in an overall reduction in NOX emissions from the facility. Additionally, the net emissions increase of volatile organic compounds (VOC) from the overall project (including creditable decreases) will be less than the Nonattainment New Source Review (NNSR) applicability thresholds. Therefore, the proposed project will not trigger NNSR permitting for NOX and VOC. The proposed project will trigger PSD permitting for carbon monoxide (CO), particulates (PM, PM10, and PM2.5), and greenhouse gas (GHG) emissions.

Those pollutants not subject to PSD or NNSR will be subject to the Texas Commission on Environmental Quality (TCEQ)'s minor New Source Review (minor NSR) requirements. In addition to permitting normal operation emissions, *Air Liquide* intends to permit start-up, shut-down, and maintenance (SSM) emissions as part of this project.

2.0 NATURAL ENVIRONMENT

As part of the West Gulf Coastal Plain, the environmental setting of the region is a combination of flat coastal zones and slightly rolling inlands set between eastern woodlands and western prairies (Finneman 1938). The general area is associated with creeks, agricultural fields, marshlands, and urban or otherwise developed properties. Dunes, ridges, and incised stream channels break the flat topography of the coast, while upland terraces are at times dotted with natural sand mounds. The climate is mild with hot summers and warm winters with the occasional cold front bringing temperatures to around freezing. The region includes many vegetation zones. Those near the coast contain marsh, shortgrasses, and water-tolerant trees, while those further inland may include oak savannas, prairies, mixed hardwoods, and dense pines (Jones 1983).

2.1 ECOLOGICAL SETTING

The archeological and ethnohistoric records (summarized by Aten 1979; 1983a) indicate that the indigenous people in the Upper Texas Gulf Coastal Plains and Galveston Bay area were nonagricultural foragers. Based on ethnohistoric documentation, Aten (1979; 1983a) hypothesized that the local indigenous groups occupied the coast temporarily on a seasonal basis. Foraging groups worldwide have been shown to acquire key resources through some degree of transhumance within more or less defined territories (Binford 1980; Lee and DeVore 1968) such as the seasonal-rounds hypothesized by Aten (1983b) for foragers along the upper Texas coast. Seasonal data from shell-bearing sites in the region support Aten's (1983a) hypothesis that occupation or use of coastal resources was temporary and recurred on a seasonal basis. The following discussion of the environment, therefore, includes the variety of resources that would have been available in the Upper Texas Gulf Coastal Plains and Galveston Bay area.

2.2 GEOLOGY

The entire upper Texas coast lies in Fenneman's (1938) West Gulf Coastal Plain physiographic province. The West Gulf Coastal Plain is a relatively young area characterized by geologic formations that dip toward the Gulf of Mexico. The Pleistocene-aged Beaumont Formation governs the topography of Galveston Bay. The Beaumont Formation consists of spatial arrangements of clay, silt, and fine sand reflecting the distribution of fluvial and mudflat/coastal facies (Abbott 2001). According to Van Siclen (1985), raised, sandy meander-belt ridges on the Beaumont surface are relict Brazos and San Jacinto River channels and natural levees separated by low, relatively featureless, clayey backswamp deposits.

During the Wisconsin glacial maximum, sea level was approximately 100 meters (m) below its modern position, and coastal rivers cut down into the older Pleistocene deposits, creating a series of valleys along the coast. As sea level rose after circa 18,000 B.P., these coastal river valleys were inundated and created long embayments (Ricklis 1994). Galveston Bay and its secondary embayments

are the result of the inundation of the Pleistocene channels of the Trinity and San Jacinto Rivers.

Ricklis (1993) argues that Holocene sea level rise was episodic, and he demonstrates that gaps in radiocarbon dates from coastal archeological sites in the Corpus Christi area correspond to periods of apparent sea level rise. Ricklis (1993) suggests that the rich marine ecosystems of the bays and lagoons broke down during these periods of rapid sea level rise (6000–7000 B.P. and 3000–4000 B.P.), leading to decreased utilization by coastal groups. Early shell midden components near Galveston Bay, such as those reported by Gadus and Howard (1990) and Howard et al. (1991) suggest a similar pattern may eventually be defined as our knowledge of Archaic coastal exploitation continues to grow.

Ricklis and Weinstein (2005) and Widmer (2005) both agree that an essentially modern sea level was reached circa 3000 B.P., which allowed the development of stable barrier islands as well as productive bays, estuaries, and inundated shallows along the coast. The development of these resource-rich areas and their increased exploitation by aboriginal groups are mirrored, in part, by the advance of modern climactic conditions, as discussed in Section 3.0 Cultural Setting.

2.3 SOILS

Soils within the present project area are identified as Urban land complex, which consists of built-up and developed areas where filling and/or grading has occurred (Wheeler 1976:21–22). Those areas have experienced significant disturbances and are not conducive to containing intact archeological resources. Previously found in undisturbed areas, soils in the project area consisted of leveled Lake Charles clay, 0 to1 percent slopes (Crout 1976). The Lake Charles series is derived from the Beaumont Formation of the Pleistocene age and are characterized as slowly permeable. Located both on fairly level areas and along the sideslopes of drainages, the Lake Charles series is moderately-to-well drained. Abbott (2001) describes the series as having a low geoarcheological potential.

2.4 FLORA AND FAUNA

The majority of the industrialized Project Site is void of natural vegetation. Where present in adjacent areas of the APE, the natural vegetation is limited to small, scattered, undeveloped tracts. Even the undeveloped tracts show signs of past disturbance.

Presently, the few patches of existing woodlands within the project area contain native hardwood species such as cedar elm (*Ulmus crassifolia*), post oak (*Quercus stellata*), water oak (*Quercus nigra*), and sugar hackberry (*Celtis pallida*), and non-native species such as Chinese tallow (*Sapium sebiferum*). Common understory species in these woodlands include trifoliate orange (*Poncirus trifoliolata*), yaupon (*Ilex vomitoria*), gum bumelia (*Sideroxylon lanuginosum*), and Chinese privet (*Ligustrum sinense*). There are also a few small patches of improved pastures

containing native and introduced grasses such as common carpetgrass (*Axonopus fissifolius*), St. Augustine grass (*Stenotaphrum secundatum*), bahiagrass (*Paspalum notatum*), and smutgrass (*Sporobolus indicus*).

Historically, the climate and vegetation of the upper Texas coast reflect the latitude, low elevation, and influence of proximity to the Gulf of Mexico. The region is bound on the west by the Brazos River, on the east by Galveston Bay, and on the north by an arbitrary line that closely approximates the southern extent of the prehistoric Caddo settlement (Ensor 1991). In general, two (2) communities of vegetation can be identified near the project area: Coastal Prairies and Coastal Gallery Forests (McMahan et al. 1984).

The Coastal Prairies are nearly topographically flat, characterized by clayey soils, and generally only a few meters above sea level. The Coastal Prairie consists primarily of grasses with minor amounts of forbs and wooded plants, and is characteristic of upland areas that are not saturated on a seasonal basis (Abbott 2001:24). Principal taxa include little bluestem (*Schizachyrium scoparium*), indiangrasses (*Sorghastrum* spp.), eastern gamagrass (*Tripsacum dactyloides*), switchgrass (*Panicum virgatum*), brownseed paspalum (*Paspalum plicatulum*), silver bluestem (*Bothriochloa saccharoides*) buffalograss (*Buchloe dactyloides*), threeawn (*Aristida* spp.), and Texas wintergrass (*Stipa leucotricha*). Sunflower (*Helianthus* spp.), Engleman daisy (*Englemannia pinnatifida*), bluebonnets (*Lupinus texensis*), ragweed (*Ambrosia* spp.), croton (*Croton* spp.), verbena (*Verbena* spp.), and winecup (*Callirhoe* spp.) are common forbs. Woody plants include mesquite (*Prosopis* spp.), huisache (*Acacia farnesiana*), eastern baccharis (*Baccharis halimifolia*), rattlebush (*Sesbania drummondii*), live oak (*Quercus virginiana*), elm (*Ulmus* spp.), hackberry (*Celtis pallida*), bumelia (*Sideroxylon lanuginosum*), and coralberry (*Symphoricarpos orbiculatus)* (Abbott 2001). As the Coastal Prairie grades into the Pine-Hardwood forest, the frequency of trees increases.

The upland coastal prairies provide habitats for a number of mammals, including white-tailed deer, eastern cottontail (*Sylvilagus floridanus*), jackrabbit (*Lepus californicus*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), raccoon, eastern spotted skunk (*Spilogale putorius*), striped skunk (*Mephitis mephitis*), opossum (*Didelphus virginiana*), and bobcat (*Lynx rufus*) (Abbott 2001). During historic times, bison (*Bos bison*), black bear (*Ursus americanus*), and gray wolf (*Canis lupis*) were present on the coastal prairies and woods in the Galveston Bay region, some of which were known ethnographically to be hunted by native peoples (Folmer 1940).

The Coastal Gallery Forests consist of diverse trees and understory occupying the floodplains of streams along the outer coastal plain (Abbott 2001). A variety of oaks (*Quercus* spp.), elms (*Ulmus* spp.), and pines (*Pinus* spp.), as well mulberry (*Morus rubra*), ash (*Fraxinus* spp.), sweetgum (*Liquidambar styraciflua*), hawthorn (*Crataegus* spp.), dogwood (*Cornus* spp.), hickory (*Carya* spp.), bois d'arc (*Maclura pomifera*), willow (*Salix* spp.), cottonwood (*Populus deltoides*), and sumacs (*Rhus* spp.) are included in these areas. The understory commonly includes mustang grape (*Vitis mustangensis*), greenbriar (*Smilax* spp.), yaupon

(*Ilex vomitoria*), coralberry (*Symphoricarpos orbiculatus*), possumhaw (*Ilex decidua*), elderberry (*Sambucus canadensis*), and dewberry (*Rubus trivialis*), as well as little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*) and indiangrass (*Sorghastrum* spp.) grasses. Frequently flooded areas support stands of dwarf palmetto (*Sabal minor*), and bald cypress (*Taxodium distichum*) trees are common in relict stream channels and swamps (Vines 1977).

White-tailed deer are abundant in the floodplain environment, as well as gray and fox squirrels (*Sciurus* spp.), raccoons, opossum, swamp rabbits (*Sylvilagus aquaticus*), and muskrats (*Ondatra zibethicus*). Beaver (*Castor canadensis*) and river otters (*Lutra canadensis*) were once common to these areas. In addition to a number of snakes and turtles, alligators (*Alligator mississippiensis*) are common in riverine and floodplain environments. Upstream of brackish waters, bowfin (*Amis calva*), shiners (*Lythrurus umbratilis, Cyprinella venusta, Notemigonus crysoleucas*), yellow bullhead (*Ameiurus natalis*), largemouth bass (*Micropterus salmoides*), and sunfish (*Lepomis* spp.) are found in rivers and larger streams (Ricklis 1994).

3.0 CULTURAL SETTING

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 1983a; 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, Late Prehistoric/Ceramic, 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 temporal shifts in dominant lifeways consider cultural, economic, and technological factors in order to provide a heuristic model useful for attempting to understand and classify ancient and early historic populations and their chronological material components. While the dates assigned to the period interfaces are based on "absolute" dating methods (e.g., Carbon-14, radiometric, dendrochronology, etc.), the cultural temporal chronologies 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.

TABLE 1: Archeological Chronology for the Upper Texas Coast (Ensor 1991)

Time Period	Dates
Paleoindian	12,000-9000 B.P.
Early Archaic	7500-5000 B.P.
Middle Archaic	5000-3000 B.P.
Late Archaic	3000-500 B.P.
Late Archaic to Late Prehistoric Transition	500 B.P.- A.D. 100
Late Prehistoric - Early Ceramic	A.D. 100-800
Late Prehistoric - Late Ceramic	A.D. 800-1700
Protohistoric	A.D. 1700-1800
Historic	post A.D. 1800

3.1 CULTURAL PERIODS

The southeast Texas region is divided into inland and coastal margin subregions, which have archeologically distinctive subsistence/settlement patterns and artifact typologies (e.g., lithics, ceramic sequencing, faunal assemblages, etc.). Archeological and historic evidence suggests that some groups exploited inland resources year round, while other groups spent seasonal parts of the year both inland and on the coast. Prehistoric archeological sites identified in Harris County tend to consist of short-term occupation sites situated on ridges or mounds near stream or river margins. Sites generally consist of temporally non-diagnostic scatters, thin subsurface deposits, or the presence of multiple cultural components within a mixed stratigraphic context. Historic sites in Harris County typically consist of farms or homesteads and cemeteries dating from the late 19th to mid-20th centuries. However, there have been no cultural resources identified within 1 km (0.6 mile) of the project's APE. The following sections are overviews of the general history of the region where the APE is located.

3.1.1 Paleoindian Period

Along the Upper Texas Coast, the Paleoindian Period begins around 12,000 B.P. and ends near 9,000 B.P. (Aten 1983a; Story 1990). Poorly represented in the archeological record for the region (Aten 1983a), few sites for this period have been verified. During this time, highly nomadic populations presumably continued with a 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 Age. Plant foods and small game undoubtedly supplanted this diet, and these secondary resources may have played a more important role in the social structure and adaptive subsistence strategies of these nomadic hunters (Black and McGraw 1985; Patterson 1995). Isolated artifacts include Clovis, Angostura, Scottsbluff, Meserve, Plainview, and Golondrina point types (Aten 1983a). Sites from this period would be either buried by alluvium or found in remote, undisturbed upland settings.

The Transitional Archaic Period begins about 9,000 B.P. and ends around 7,500 B.P. (Aten 1983a; Story 1990). This stage is also poorly represented in the archeological work in the area, but isolated finds of Bell/Calf Creek, Early-Side Notched, and Early Expanding Stemmed dart points are attributed to this time period.

3.1.2 Archaic Period

The Archaic Period is believed to include a shift towards a plant-processing and extraction subsistence, yet the archeological record suggests that the diet is still broad-based and relies primarily on hunting. Plant-processing technology seen during the Archaic Period includes stone-lined hearths, baking pits, and milling/grinding lithic tools (Story 1990). Populations travel less distances and population densities begin to rise.

Beginning at 7,500 B.P. and spanning 2,500 years (Aten 1983a), the Early Archaic Period in this region has not been well documented. By 6,100 B.P., the Late Wisconsin glaciation had ended, increasing climatic aridity and creating extensive changes in the environment. The Laurentide ice sheet that once occupied the Great Plains did not entirely disappear until about 6,000 years ago. As a result of climatic changes, the majority of Pleistocene megafauna became extinct. Drastic changes in the dominant subsistence strategies of the affected populations were required. The remaining populations adapted to the environmental changes by shifting to lifeways dominated by seasonal subsistence strategies. The result was a regionally circumscribed and repetitive exploitation of specific floral and faunal resources. By remaining sedentary in familiar territory, the nomadic populations were able to better exploit the various resources available within their local environment.

Like Paleoindian sites, the discovery of Early Archaic sites remains allusive because they likely have been destroyed during the last century or they are

deeply buried (Aten 1983a; Story 1990). *In situ*, Early Archaic remains have been found at the Addicks Reservoir as well as a limited number of other localities in the region (Story 1990). Most recently at the Grand Parkway Interchange near Katy, Texas, the earliest known burials in Harris County are believed to have been located (Coastal Environments, Inc. – Texas Department of Transportation; personal communication, August 16, 2012). Projectile points from this period include Bell, Carrollton, Trinity, Wells, and Early Stemmed, and some of these points continued to be used into the Middle Archaic (Ensor 1987; Patterson 1995).

The Middle Archaic Period (5,000 to 3,000 B.P.) is represented by the earliest surviving shell middens (Aten 1983a). These middens often contain remains of shellfish, such as oysters and estuarine clams; faunal material from terrestrial and aquatic vertebrates; and the earlier known human burials in the region (Aten 1983a). Characteristic projectile points include Bulverde, Williams, Lange, and Pedernales types. Site 41GV53 dates between 5,000 and 3,500 years ago and is situated near present-day League City, along Clear Creek, a sizeable stream that drains into the east shore of Galveston Bay.

The Late Archaic Period lasted from 3,000 to 500 B.P. and shows evidence of an increasing population (Aten 1983a). By 2,500 B.P., the climate was similar to the modern climate, and sea levels stabilized during this time period. The Galveston Bay estuary system as we know it was fully formed. Most documented archeological sites identified from this period contain rangia shell middens, and nearly all Late Archaic sites occur along the shores of the secondary bays and the lower stretches of the streams and rivers that empty into the bays. As local populations grew, indigenous peoples made increased use of estuary resources, especially shellfish and fin fish. Ground and chipped stone, lithic artifacts were made from materials as far away as southwestern Arkansas. Artifact caches found in context with human remains at cemeteries such as the Ernest Witte Site in Austin County indicate the possibility of trade goods within these burials (Hall 1981). Projectile points differ from earlier periods in that they are corner-notched or expanding-stemmed forms, such as the Kent, Ellis, and Pontchartrain varieties. Other types can be found, such as the un-notched Pamillas. These point types are thought to precede the Gary type, which can be found into the Late Prehistoric (Story 1990). During the Late Archaic, more utilitarian biface lithic tools are prevalent as well as bone tools. Late Archaic lithic assemblages are similar to the transitional Early Ceramic phase of the Late Prehistoric period (Aten 1983a).

3.1.3 Late Archaic to Late Prehistoric

The transition from the Late Archaic stage to the Late Prehistoric is indicated by the introduction of ceramics into the assemblage (Aten 1983a; 1983b). By definition, the Archaic (or "Preceramic") era in Galveston Bay area is said to end with the introduction of ceramics approximately 2,000 years ago (but more likely several hundred years earlier). The Late Prehistoric period includes an Early Ceramic (A.D. 100-700); an Initial Late Prehistoric (A.D. 700-1250); and a Final Late Prehistoric (A.D. 1250-1528) sub-periods or phases. For simplification, most

researchers designate between an Early and Late Ceramic sub-period. The Final Late Prehistoric is followed by the Protohistoric period, which began with the arrival of Cabeza de Vaca and his fellow shipwrecked survivors of the Narvaez expedition in 1528 and which lasted until A.D. 1700 with formal French and Spanish colonization efforts.

Ceramic technology appears to have spread westward into the area from Louisiana and the Lower Mississippi Valley. Early pottery along the Upper Texas Coast consists of thick-walled vessels very similar to Tchefuncte pottery found in central and western Louisiana. Within a few centuries, the Galveston Bay area pottery was dominated by a locally made, sandy-paste ware known as Goose Creek, a tradition that persisted until early historic times. Grog and bone-tempered pottery vessels were also made locally during the Late Ceramic phase of the Late Prehistoric sub-periods.

Cultural shifts during the Late Prehistoric include the possible adoption of a more sedentary lifestyle with major technological changes, such as sandy-paste ceramics, and inevitably, the bow and arrow (Story 1990). The cultural tradition during the Early Ceramic/Late Prehistoric period along the Upper Texas Coast is generally comparative to the Late Archaic-Early Woodland transition of the Southeastern region. Story (1990) has suggested the use of the term Mossy Grove Tradition to define cultural patterns emerging from the Upper Texas Coast. The Trinity River seems to be a dividing line in this tradition with cultures east of the river being more similar to those in Louisiana compared to the cultures west of Galveston Bay.

The eastern tradition also seems to have begun earlier than that in the west, starting around 2,000 B.P. and lasting approximately 600 years (Aten 1983a; Story 1990). Story (1990) divided the Mossy Grove Tradition into five (5) distinct time intervals on the coast, while noting that only two (2) are found inland. Aten (1983a) defined these intervals for the area between the Brazos River and Galveston Bay as the Clear Lake (A.D. 100 – 400); Mayes Island (A.D. 400-650); Turtle Bay (A.D. 650 – 1000); Round Lake (A.D. 1000 - 1350); and Old River (A.D. 1350-1700) Phases based on ceramic styles. Only the Round Lake Period was recognized by Aten (1983a; 1983b) for the West Bay-Brazos Delta area due to the low artifact class diversity compared to other areas east of Galveston Bay. Further, the Old River Phase/tradition featured a dating discrepancy in which equivalent cultural/temporal-period sites are classified separately within the West Bay-Brazos Delta area compared to similar sites identified to the east. As the ceramic technologies and traditions spread westward into the area from Louisiana, cultural/temporal-periods quickly became acculturated except in remote regions like the West Bay-Brazos Delta area.

Early ceramics from this eastern area were similar to Tchefuncte (Tchula) Period wares found near Sabine Lake into Louisiana and included sandy-paste varieties such as Mandeville Plain, Goose Creek Plain (Anahuac variety), and Tchefuncte Plain (Aten 1983a; Story 1990). These early sites also appeared similar to pre-ceramic transitional sites due to the low frequency of ceramics recovered. The

appearance of sandy-paste and sand-tempering occured about A.D. 200 with the O'Neal Plain (Conway variety) being a good example (Aten 1983a). Rocker-stamped decorations, a distinctive marker for this period, were uncommon in the West Bay-Brazos Delta area, as were incised wares (Aten 1983a).

The Mayes Island Period brought about the introduction of the bow and arrow around A.D. 600, which was probably used along with the atlatl until the Historic Period (Aten 1983a; Story 1990). The smaller, projectile points during this period included both notched and expanding-stemmed forms (Aten 1983a; Story 1990).

Ceramic indicators for the Turtle Bay Period included Goose Creek red-filmed along with other decorated ceramics, all of which were rare in the West Bay-Brazos Delta area. The appearance of Caddoan pottery along the Upper Texas Coast between A.D. 1000 and 1300 suggested the presence of extended trade networks and/or migration during this time. At the beginning of the Round Lake Period, the earliest use of grog, defined as large-crushed ceramic particles for tempering agents, was seen. Typical ceramic sequencing traditions included Baytown Plain (San Jacinto variety) and San Jacinto Incised. Along with these types, a reduction in Goose Creek varieties was seen. Aten (1983a) described this period as having a population increase due to the larger number of concentrated sites in more specialized locations.

During the Old River Period, a resurgence of Goose Creek ceramics was seen as the Baytown types decreased in popularity. Contact with Europeans began near the end of this period, but visible changes in material culture were not seen until about A.D. 1750 along with a rapid decline in population (Story 1990).

At the end of the Late Ceramic sequence, the Protohistoric to Early Historic transitional periods witnessed the last indigenous, ceramic sequence with the appearance of Orcoquisac pottery between A.D. 1700 and 1800. With the colonization of Texas and Louisiana by the Spanish and French, the Early Historic period began as Native American cultural traditions changed in obvious, fundamental lifeways. By the middle of the 19th century, the indigenous peoples of the Galveston Bay area were gone, victims of the intrusion of Old World peoples into the New World.

3.1.4 Harris County History

Harris County was formed from Harrisburg County on December 22, 1836, and was officially renamed Harris in December 1839 to honor John Richardson Harris, an early pioneer who had established Harrisburg in 1826, the first town site in the county. Harrisburg was established at the confluence of Buffalo Bayou and Brays Bayou, and by the 1830s, the town had become a major port of entry and a transportation hub for the region. Roads ran northwest to the Brazos communities of San Felipe and Washington, east to the ferry landing that crossed the San Jacinto, and west paralleling Brays Bayou to the Oyster Creek Community near present day Stafford in Fort Bend County.

Under Mexican rule, the area surrounding Harrisburg was known as the San Jacinto District. The district stretched east from Lynchburg on the San Jacinto River west to the location of present day Richmond, and from Clear Creek in the south to Spring Creek in the north. Harrisburg County encompassed this same territory with the addition of Galveston Island. The modern boundaries of Harris County were established in 1839 (Henson 2011).

The lands that would become Harris County comprised the southeastern border of Austin's Colony. In July of 1824, a total of 29 land grant titles was authorized in future Harris County, with an additional 23 grants made between 1828 and 1833. These original grants concentrated mainly on the watercourses of the region (Henson 2011). Early settlers arrived predominantly from the southern United States and brought with them their slaves. In the 1840s, large numbers of German and French immigrants settled in Harris County. The Hispanic presence in the region was relatively sparse prior to an influx of immigrants following the Mexican Revolution reflecting the ephemeral nature of Spanish and Mexican colonization. The immigrants that came to the area following the Civil War founded settlements along the rail lines that bisected the county. The Houston farming communities of Pasadena, Deer Park, Houston Heights, Bellaire, Webster, La Porte, South Houston, and Genoa developed in this manner and were eventually annexed into the city of Houston. Within a century, Harris County had become the largest county and Houston the largest city in Texas.

By the mid-19th century, Houston and Harris County had become a center of commerce. Products were imported into the Texas hinterland through Houston after being offloaded from ocean going ships in Galveston. Exports included agricultural products such as cotton, corn, and cow hides. The city became a railroad hub with sic (6) railways spreading from 80.5 to 160.9 kilometers (50 to 100 miles) to the northwest, east, west, south, and southeast (Henson 2011).

In 1873, Houston joined the national rail network when the Houston and Texas Central reached Denison (Henson 2011). From the 1890s until the second decade of the 20th century, the growing gas and oil industry helped create a significant boom in population and was competing with agricultural and cattle interests in Harris County. In addition, shipping continued as a major enterprise. In 1890, the Houston Shipping Channel was officially purchased by the U.S. Government under the direction of the U.S. Army Corps of Engineers (USACE) for navigation and maintenance. Although the improved channel under the USACE allowed some large vessels to travel to Houston, Galveston remained the main port along the Texas Gulf coast until the 1900 hurricane devastated Galveston.

The closest town to the Project Site is La Porte, which was founded in 1892, and is located on the northwest shore of Trinity Bay, the inland extension of Galveston Bay. Covering an area of 15 square miles in southeastern Harris County, La Porte was established as a real estate venture by a group of men including A. M. and J. H. York, I. R. Holmes, and T. W. Lee, who chose the French word for "door" as the town's name. By 1900 La Porte had a population of 537. St. Mary's Seminary was founded the same year by Bishop Nicholas A.

Gallagher and remained in La Porte until 1954, when it was moved to Houston. In 1915, La Porte suffered from two major disasters: 1. a fire that destroyed the downtown business district, and 2. a tremendous hurricane (Kolodzy 2012).

With its many railroads and industrial facilities, Houston began to surpass Galveston as the major commercial and shipping port of the region. Industry east of downtown Houston near the Port of Houston grew in the first decades of the 20th century due to discovery of oil at Spindletop, Texas, northeast of Houston. Shortly thereafter, large oil reserves were found in the area surrounding Houston, and the improved Ship Channel provided an avenue for exporting the commodity. As a result, by 1920 multiple oil companies were located in Houston. These companies built offices in the city of Houston as well as refineries near the Port of Houston, which further diversified the city's economy.

Between the 1920s and 1930s, La Porte gained national attention because of Sylvan Beach Amusement Park, where a number of big bands including those of Rudy Vallee, Phil Harris, and Benny Goodman performed at dances and beauty contests. Until World War II, La Porte continued as a sleepy little village with only Sylvan Beach and the summer residents at Bay Ridge sustaining the economy. Shipyards in the area and the growing petrochemical industry along the Ship Channel provided employment for new residents (Kolodzy 2012).

Oil and cotton interests soon began to vie for dominance in the Houston shipping industry. By 1929 Houston had 475 manufacturing industries (Henson 2011). These industrial facilities were located near the Port of Houston, along the Buffalo Bayou, and near the railroad lines. The ratio of cotton compresses to oil refineries was almost one-to-one during this period, showing the increased role of oil by the 1930s (Henson 2011).

Manufacturing began to increase in Houston before and during World War II. During the 1930s, Houston became second in the nation in shipping, and by the end of the decade, approximately 62 percent of the city's population worked in the petroleum industry or related businesses (Henson 2011). Outlying areas surrounding the city were still dependent on agriculture and continued to support the economy of Houston. With the outbreak of World War II, Houston entered the shipbuilding and national defense industries. Synthetic rubber was mass produced for the first time during the war, and two synthetic rubber plants were located near the Port of Houston. Other industries found in and around Houston included mechanical parts manufacturing, magnesium, steel, and natural gas (Henson 2011).

After World War II, the petrochemical industry continued as a center of activity near the Ship Channel. Cotton, while still an important part of the agricultural economy, was overshadowed by oil and gas production and shipping. Additionally, a new commodity, grain from the Midwest, was shipped from Houston after the war. In order to keep up with increased shipping, the Ship Channel was continually maintained and updated by the USACE.

The U.S. Congress approved plans for the USACE to further widen and deepen the channel multiple times during the mid-20th century. Throughout the 20th century, the Port of Houston adapted to the changing needs of local industries. Container shipping, a common sight today, was first introduced at the Port of Houston in the mid-1950s. By the end of the 20th century, scores of industries moved to Houston, as the Ship Channel, Port of Houston, and the vast railroad network made the city one of the largest and busiest shipping and import/export centers in the U.S.

The opening of the La Porte-Baytown tunnel in 1954 and the coming of the Lyndon B. Johnson Space Center and Bayport Channel helped the growth and prosperity of the city. By 1970, La Porte had a population of 7,149. The consolidation of Lomax with La Porte in 1980 and the growth of Fairmont Park further enhanced the prosperity of the city. Although the population of La Porte continued to grow during the 1980s, its residents still considered it a small recreational community. In 1990 La Porte had a population of 27,910. Plans were being made to revive the Sylvan Beach area, which had been battered by several hurricanes over the previous 50 years, with proposals including the construction of large beachfront hotels. In 2000 the population was 31,880 (Kolodzy 2012).

4.0 METHODOLOGY

Archival research combined with accurate field recordings and documentation become integral components that build the foundations for all cultural resources investigations. The efforts outlined below are in compliance with the *Secretary of the Interior's Standards and Guideline: Standards for Identification* (as well as the *Secretary's Professional Qualification Standards for Archaeologists and Historians* 36 CFR Part 61) as prepared under the authority of Sections 101(f) (g), and (h), and Section 110 of the NHPA (*48 Federal Register 44716*: September 29, 1983). Moreover, documentation generally results in both greater factual knowledge about the specific property and its values, and a broader understanding of the property in its historical context. In addition to increasing factual knowledge about a property and its significance in one historical context, documentation may also serve to link the property to or define its importance in other known or yet-to-be defined historic contexts.

Prior to the site file and literature review, the THC SHPO was notified by letter of ERM's intent to conduct a reconnaissance survey of the Project Site. The SHPO Consultation forms were also mailed prior to our field investigation (Appendix C: THC SHPO Consultation Forms). A Texas Antiquities Permit was not needed since no new ground disturbing activities are anticipated, and since the archeological fieldwork investigation is confined within the Project Site, which is on private land.

4.1 SITE FILE AND LITERATURE REVIEW

Site file research was initiated prior to fieldwork mobilization in order to identify all previously recorded archaeological sites and previous investigations within a 1 km (0.6 mile) radius of the Project Site, as well as all recorded historic structures. This information was obtained by reviewing records through the online Texas Archeological Sites Atlas (TASA), which is maintained by the THC. The TASA review indicates that no known archeological sites, structures, NRHP-listed or eligible properties or NRHP-Districts, State Archeological Landmarks, Texas Historic Markers, and/or cemeteries are located within the APE.

4.1.1 Additional Background Research

The 1927 land grant that contains the APE was obtained from the Texas General Land Office (GLO) county maps, and showed that the project area had remained largely rural and undeveloped until the 1960s. Additional historic aerial and topographic maps were provided by the Texas Natural Resources Information System (TNRIS) and the USGS Map Locator service. The archival, site file research, and desktop survey work associated with this assessment also relied on a review of information relating to the APE from the following databases and archives:

- The University of Texas (Austin) Briscoe Center Map Collection;
- The University of Texas (Arlington) Special Collections Library;

- Texas State Historical Association Archives;
- Texas State Archeological Landmarks;
- National Park Service (NPS) – NRHP Properties;
- Texas State Library and Archives Commission Collection – Texas Heritage Online;
- U.S. Library of Congress;
- Harris County Tax Assessor's Office – Block Book Map Search; and
- USGS 7.5 minute series, Topographic Map Search; Historic Quadrangle Maps include: Seabrook 1916; La Porte 1916; Seabrook 1932; La Porte 1944; League City 1955; La Porte 1955; La Porte 1967; League City 1982; and La Porte 1982.

4.2 ARCHEOLOGICAL FIELD METHODS

The archaeological investigation associated with the current undertaking was designed to identify and assess all sites, historic and prehistoric, within the project's APE. Potential, buried (subsurface), surface archaeological resources and/or structural ruins fall within the purview of this investigation. In addition to site identification, the investigation also must provide sufficient data to determine whether or not additional investigations will be required to evaluate fully the potential eligibility of any newly defined site location for inclusion on the NRHP or as a State Archaeological Landmark (SAL).

Since no new construction activities (e.g., ground disturbances, excavations, etc.) are anticipated, neither a systematic nor a judgmental shovel testing survey was implemented or warranted. Pedestrian reconnaissance efforts within the APE included surface inspection and photo documentation in areas that had been impacted, disturbed, and altered by past construction and ground disturbances (e.g., land moving, grading, and filling activities; landscaping; excavations; and commercial development) resulting in the industrial facilities that are present today. Pedestrian reconnaissance and photo documentation also inventoried and recorded areas within the APE where previous ground disturbances and land moving activities not associated with the current project have disturbed soil stratigraphy.

4.3 ARCHITECTURAL RECONNAISSANCE SURVEY

This ERM task includes the field efforts to identify architectural resources within the APE and within a 1 km (0.6 mile) radius of the Project Site's viewshed. The visual APE is established by a vehicular and pedestrian assessment of topography, vegetation, and modern intrusions within the study environment. As previously defined, indirect effects consist of visual impacts, noise/vibration, and air emissions containing hazardous constituents, which include the broader surrounding area that might experience visual or other effects from the project (THC: *The Section 106 Review Process* 2012). The architectural survey portion of

this CRA is primarily concerned with visual impacts to historic properties. The task includes a windshield level of effort supplemented by pedestrian reconnaissance as necessary to include:

- Recordation of each potential architectural resource using GPS coordinates;
- Photo documentation of each resource; and
- Collection of adequate field data to make a preliminary determination on NRHP eligibility.

Structures are defined as any standing architecture. In addition to physical structures, cultural features within the environment including historic routes (i.e., roads, rail lines, canals, waterways, trails, etc.); vegetation (i.e., parks, century-old trees, landscaped barriers or lawns, etc.); historic markers; designated or unmarked cemeteries; monuments; objects; or other cultural resources such as Traditional Cultural Properties (TCPs) or NRHP-listed Districts are investigated in the architecture survey of the Project Site and within a 1 km (0.6 mile) radius of the Project Site's viewshed.

In order to qualify as historic, structures and/or cultural features generally must be at least 50 years old. Photographs of the general viewshed within and surrounding the APE are taken and GPS coordinates are recorded when historic and/or cultural resources are encountered. Both references are keyed to the project maps as well as their corresponding field forms. Sketches are also performed in the field and recorded in field journals as necessary. All information compiled in the field for the structures recorded were compared with the Harris County Tax Assessor's Office, parcel information, Texas GLO, and USGS Quad and county highway maps prior to 1962 to verify construction or build dates.

5.0 RESULTS OF INVESTIGATIONS

The primary purpose of this investigation was to: 1) determine if any previously identified cultural resources or National Register properties were located within a 1 km (0.6 mile) radius of the APE; 2) determine if any previous cultural resource investigations had been conducted in or near the APE; 3) determine whether or not any previously unidentified and intact cultural resources were present within the APE by conducting an archeological and reconnaissance survey; 4) perform the preliminary evaluation of the existing historic structure remains to establish their eligibility for the National Register; and 5) provide management recommendations based on the research and survey activities.

5.1 RESULTS OF SITE FILE AND LITERATURE REVIEW

Research activities, including a site file research and a review of available historic maps, were initially undertaken for the project as part of a pre-fieldwork literature and site file review. Three (3) prior cultural resources surveys were conducted within 1 km (0.6 mile) radius of the APE, and no previously identified archaeological site or historic properties were located (Appendix A: Project Survey Maps). The surveys include:

- Environmental Protection Agency (EPA) Survey No. 2210 (1981): No Texas Antiquities Code (TAC) Permit Number – No Information Available; No Report on File at the THC; No Cultural Resources Identified.
- U.S. Surface Transportation Board Survey No. 10547 completed by Douglas Mangum and Roger Moore of Moore Archeological Consulting (2003): No TAC Permit Number – Pedestrian survey south and west of *Air Liquide*'s current APE; No Cultural Resources Identified.
- Texas Department of Transportation Survey No. 11565 completed by James P. Mooney and Ruth A. Mathews of Michael Baker, Jr., Inc. (2006): TAC Permit Number 3770 – Pedestrian survey east of *Air Liquide*'s current APE; No Cultural Resources Identified.

Between December 2001 and January 2002, Moore Archeological Consulting, Inc. performed a linear archeological pedestrian survey along the proposed Bayport Rail Loop preferred alignment while investigating 10 alternative alignments in southeastern Harris County. Three (3) shovel tests were excavated in the preferred alignment (or survey corridor) that totaled approximately 20.36 km (or 12.65 miles) in length, a section of which skirted *Air Liquide*'s current APE to the south and west of the Project Site. All shovel tests exhibited "disturbances [that] took the form of large-scale industrial sites (such as chemical and petroleum processing plants and construction material stockpiles), and urbanized areas. Most of the other disturbances were the result of fill or churning from various construction episodes [roads, straightening of streams, pipeline and other right of ways (ROWs)]" (Mangum and Moore 2003:16). No cultural resources were identified in Magnum and Moore's (2003) survey adjacent to *Air Liquide*'s current APE.

In June 2005, the Texas Department of Transportation (TxDOT) contracted Michael Baker Jr., Inc. to assess the effects on potential cultural resources as part of an environmental assessments document within the new ROW located along a 40.6 km (25 mile) stretch of Texas State Highway 146, which is directly east of *Air Liquide*'s current APE and Project Site. A limited number of shovel tests (n=8) were excavated along the total length of the corridor due to heavy disturbances resulting from urbanization and industrialization (Mooney and Mathews 2006:ii). No cultural resources were identified during Mooney and Mathews' (2006) survey east of *Air Liquide*'s current APE.

5.1.1 Results of Additional Background Research

Additional archival research began prior to fieldwork and was conducted to determine the approximate construction dates of the industrial facilities within or in the vicinity of the APE. The earliest historic topographic quadrangle images for the project area include both the Seabrook and La Porte Quads dating back to 1917. Additional Quads were examined and these include: Seabrook 1932; La Porte 1944; League City 1955; La Porte 1955; La Porte 1967; League City 1982; and La Porte 1982.

The majority of the project area falls within the lower portion of the La Porte Quad maps. A Quad map is not available for the League City area between 1955 and 1982. All of the Quad maps showed that the project area remained rural, undeveloped, and agricultural between the earliest date of 1917 and the later date of 1967. Industrial facilities were constructed after 1967. No historic house sites, farmsteads, or agricultural support outbuildings were located within the APE. In addition, the majority of infrastructure improvements in the vicinity of the APE including the excavation of Taylor Bayou Canal to the west, an additional spur of the Southern Pacific Rail line to the west, and the expansions/improvements of Bay Area Boulevard and Texas State Highway 146 to the east have all occurred after 1967.

The earliest construction dates obtained from the Harris County Tax Assessor's Office for adjacent parcels immediately west of the project's APE are from 1972. Historic Texas GLO county maps show that the project area had not been surveyed prior to 1921, with exception to the South Pacific System Rail line (identified as the Galveston, Harrisburg, and San Antonio Railroad). All of the archival and background research efforts have revealed that no historic structures were located within the APE.

5.2 RESULTS OF FIELD INVESTIGATIONS

Since no new construction activities (e.g., ground disturbances, excavations, etc.) are anticipated, neither a systematic nor a judgmental shovel testing survey was implemented or warranted. In addition, no new linear facilities and no new supporting infrastructure improvements within or adjacent to the Project Site are planned for the proposed modifications. Pedestrian reconnaissance and

photo documentation within the APE and within a 1 km (0.6 mile) radius of the Project Site's viewshed illustrate that the landscape has been impacted, disturbed, and altered by past construction, landscaping, land moving activities, and commercial development resulting in the industrial landscape and facilities today (Appendix B: Site Investigation Photos).[1] Pedestrian reconnaissance and photo documentation also illustrate areas within the APE where previous land moving activities not associated with the current project have disturbed soil stratigraphy. The reconnaissance survey inspected exposed soils and backfill piles for the presence of artifacts; none were observed. The field survey inspection of surface soils and backfill piles confirmed that the soil series within the APE is Urban land complex, which consists of built-up and developed areas where filling and/or grading has occurred (Wheeler 1976:21–22), and which is not conducive to containing intact archeological resources.

The architectural survey portion of this CRA was primarily concerned with visual impacts to historic properties and cultural resources. Photographs of the general viewshed within and surrounding the APE were taken (Appendix B: Site Investigation Photos). No structures at least 50 years old and older were identified during the architectural survey both within the APE and within a 1 km (0.6 mile) radius of the Project Site's viewshed. In addition to physical structures, a vehicular and pedestrian assessment was conducted to examine cultural features that may not have been recorded or documented within the environment including historic routes (i.e., roads, rail lines, canals, waterways, trails, etc.); vegetation (i.e., parks, century-old trees, landscaped barriers or lawns, etc.); historic markers; designated or unmarked cemeteries; monuments; objects; or other cultural resources not associated with the definition of an archeological site. No cultural resources were identified during both the architectural and archeological field survey within and adjacent to the APE. *Air Liquide*'s proposed project should be allowed to proceed as planned without additional cultural resources investigations.

[1] Initial Reconnaissance Site Photodocumentation was conducted on August 30, 2012. Photos taken from the initial reconnaissance were evaluated with the pedestrian field survey conducted on September 30, 2012. Photos from the August 30, 2012, initial site visit are used for the Photodocumentation located in Appendix B.

6.0 CONCLUSIONS AND RECOMMENDATIONS

ERM's CRA presents the findings of an archival and literary review and a pedestrian field reconnaissance, cultural resources survey conducted for *Air Liquide*'s Bayou Cogeneration Plant located in Harris County, Texas. The proposed project is on private land and will involve the replacement of four (4) gas-fired turbines (GT1 through GT4) with similar units, the addition of three (3) new gas-fired boilers (BO1 through BO3), and the subsequent removal of three (3) existing gas-fired boilers (B-305 through B-307) at the Bayou Cogeneration Plant. No new construction activities, no new linear facilities, and no new supporting infrastructure improvements within or adjacent to the Project Site are planned for the proposed modifications. Because the project would require a GHG permit from the EPA, the project is subject to Section 106 of the NHPA of 1966, as amended.

This document has been prepared for use in completion of applicable Section 106 procedures in compliance with the NHPA of 1966, as amended. No cultural resources were identified within and adjacent to the APE through ERM's research and field survey efforts. Based on the lack of archeological deposits and historic properties within and adjacent to the Project Site as well as the absence of historic properties either listed on or eligible for inclusion to the NRHP, and based on the industrial setting, modern construction, historic land use and soil conditions, it is ERM's opinion that there is no potential for the APE to contain previously unidentified archeological resources or those eligible for inclusion to the NRHP. As such, the project should be allowed to proceed as planned without additional cultural resources investigations as the proposed construction would not affect any historic properties pursuant to 36 CFR 800.4(d)(1). Therefore, we request the Texas Historical Commission's concurrence with this conclusion.

6.1 SUMMARY OF EFFECTS

<u>*Air Liquide*'s Bayou Cogeneration Plant: Pasadena, Harris County, Texas</u>

A finding of ***No Effect*** as defined in 36 CFR 800.4(d)(1) is anticipated from the EPA for *Air Liquide*'s Bayou Cogeneration Plant's proposed redevelopment of its cogeneration facility on Bay Area Boulevard in Pasadena, Texas. The finding is based on the absence of historic properties either listed on or eligible for inclusion to the NRHP as well as the absence of State Archeological Landmarks and other cultural resources within and adjacent to the Project Site and within a 1 km (0.6 mile) radius of the Project Site's viewshed. Project implementation ***would not*** result in a change in the character of the property's use. There are ***no*** direct or indirect effects anticipated for *Air Liquide*'s proposed Project that would alter the character of the continued industrial use of the property.

7.0 REFERENCES

7.1 PRINCIPAL INVESTIGATOR

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Project Survey Maps

Appendix A

October 25, 2013
Project No. 0151579

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000

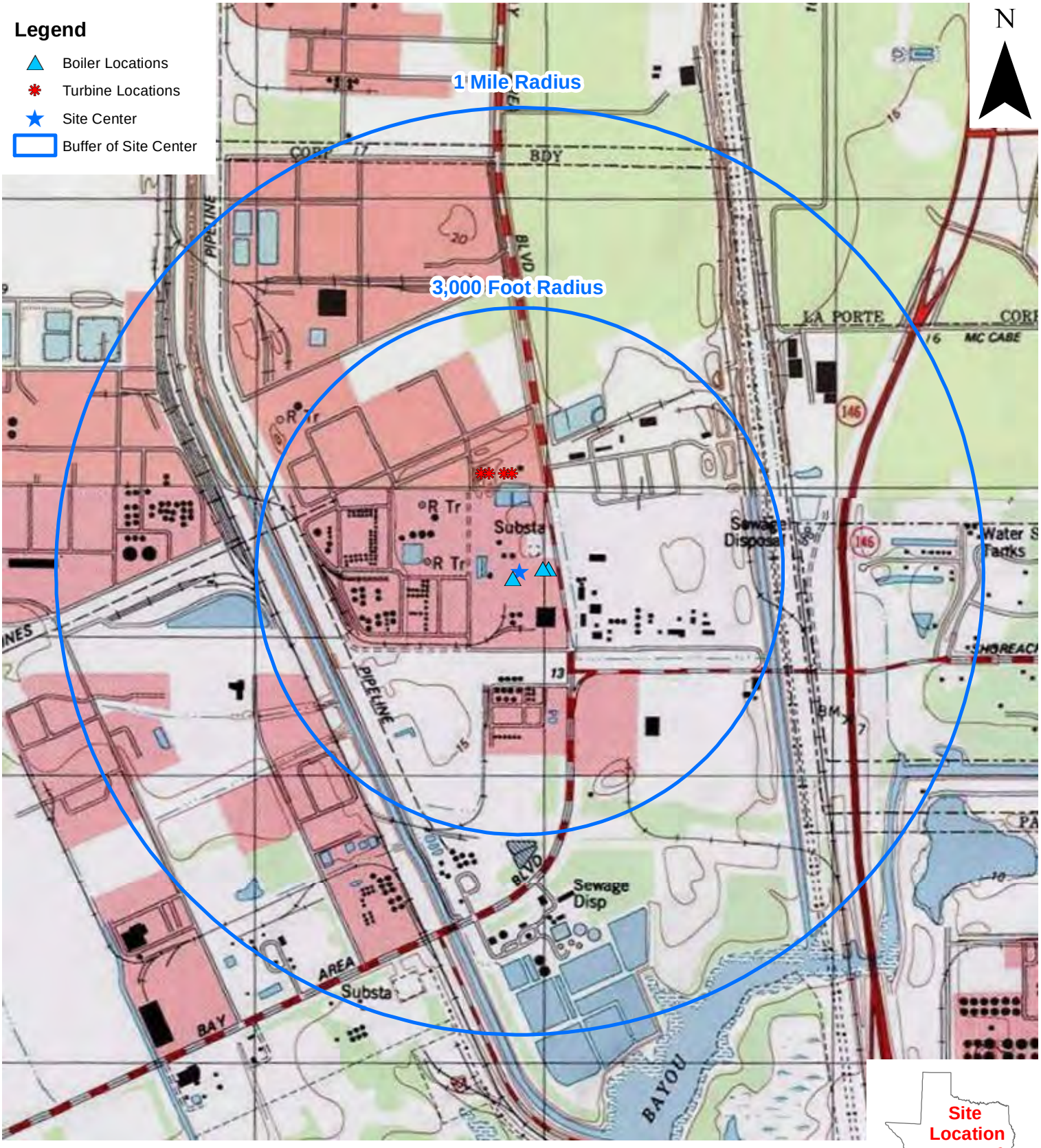
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Environmental Resources Management

DESIGN: D Port	DRAWN: EFC	CHKD.: A Ragatz
DATE: 5/24/2013	SCALE: AS SHOWN	REVISION: 0
W.O.NO.: K:\GIS\AirLiquide\Bayport_PSD\MXD\Cultural\Fig1_aerial.mxd		

FIGURE 1
3000 FOOT AND 1 MILE RADII MAP
Air Liquide Bayou Cogeneration Plant
Air Liquide Large Industries U.S., L.P.
11400 Bay Area Boulevard
Pasadena, Texas

ERM



Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

SOURCE: U.S.G.S. 7.5' QUADRANGLE, LEAGUE CITY, TX (o29095E1).

Environmental Resources Management

DESIGN: D Port	DRAWN: EFC	CHKD.: A Ragatz
DATE: 5/24/2013	SCALE: AS SHOWN	REVISION: 0
W.O.NO.: K:\GIS\AirLiquide\Bayport_PSD\MXD\Cultural\Fig2_topo.mxd		

FIGURE 2
3000 FOOT AND 1 MILE RADII MAP
Air Liquide Bayou Cogeneration Plant
Air Liquide Large Industries U.S., L.P.
11400 Bay Area Boulevard
Pasadena, Texas

ERM

Site Investigation Photos

Appendix B

October 25, 2013
Project No. 0151579

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 1	Date: 08/30/12
Direction Photo Taken: SW	
Description: Sedimentation pond (taken from inside complex)	

Photo No. 2	Date: 08/30/12
Direction Photo Taken: E	
Description: Sedimentation pond (taken from inside complex)	

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 3	Date: 08/30/12
Direction Photo Taken: E	
Description: Sedimentation pond (taken from inside complex)	

Photo No. 4	Date: 08/30/12
Direction Photo Taken: SE	
Description: Sedimentation pond (taken from inside complex)	

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 5	Date: 08/30/12
Direction Photo Taken: NW	
Description: Sedimentation pond (taken from inside complex)	

Photo No. 6	Date: 08/30/12
Direction Photo Taken: S	
Description: Sedimentation pond (taken from inside complex)	

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 7	Date: 08/30/12
Direction Photo Taken: N	
Description: Right of way (taken from inside complex)	

Photo No. 8	Date: 08/30/12
Direction Photo Taken: N	
Description: Right of way (taken from inside the complex)	

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 9	Date: 08/30/12
Direction Photo Taken: N	
Description: Right of way (taken from inside the complex)	

Photo No. 10	Date: 08/30/12
Direction Photo Taken: N	
Description: Right of way (taken from inside the complex)	

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 11	Date: 08/30/12
Direction Photo Taken: S	
Description: forest/forested wetlands, outside of Air Liquide complex	

Photo No. 12	Date: 08/30/12
Direction Photo Taken: S	
Description: forest/forested wetlands, outside of Air Liquide complex	

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 13	Date: 08/30/12
Direction Photo Taken: SW	
Description: forest/forested wetlands, outside of Air Liquide complex	

Photo No. 14	Date: 08/30/12
Direction Photo Taken: SW	
Description: forest/forested wetlands, outside of Air Liquide complex	

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 15	Date: 08/30/12
Direction Photo Taken: SW	
Description: forest/forested wetlands, outside of Air Liquide complex	

Photo No. 16	Date: 08/30/12
Direction Photo Taken: SW	
Description: forest/forested wetlands, outside of Air Liquide complex	

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 17	Date: 08/30/12

Direction Photo Taken: NE

Description: Right of way, outside of Air Liquide complex

Photo No. 18	Date: 08/30/12

Direction Photo Taken: NE

Description: drainage ditch, outside Air Liquide complex

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 19	Date: 08/30/12

Direction Photo Taken: NE

Description: Right of way, outside of Air Liquide complex

Photo No. 20	Date: 08/30/12

Direction Photo Taken: N

Description: forest/forested wetlands outside of Air Liquide complex

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 23	Date: 08/30/12
Direction Photo Taken: E	
Description: forest/forested wetlands, Right of way, outside of Air Liquide complex	

Photo No. 24	Date: 08/30/12
Direction Photo Taken: E	
Description: forest/forested wetlands, outside of Air Liquide complex	

PHOTOGRAPHIC LOG

Client Name: Air Liquide	Site Location: Bayou Cogeneration Plant	Project No. 0151579

Photo No. 25	Date: 08/30/12
Direction Photo Taken: E	
Description: Right of way, outside of Air Liquide complex	

THC SHPO Consultation Form and Concurrence

Appendix C

October 25, 2013
Project No. 0151579

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000

TEXAS HISTORICAL COMMISSION

REQUEST FOR SHPO CONSULTATION: Projects Subject to Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas

Submission of this form only initiates consultation with the Texas Historical Commission, the State Historic Preservation Officer (SHPO) for Texas. The SHPO may require additional information to complete the review for some projects.

FCC projects: this form should not be completed when submitting Form 620 or 621 for communications towers.

Section 106 of the National Historic Preservation Act of 1966, as amended, requires federal agencies to consider the effects of their undertakings on historic properties and to consult with the State Historic Preservation Officer (SHPO) regarding the undertaking. An undertaking is any action by or on behalf of a federal agency that has the potential to affect historic resources and includes funding, permits, or other approvals. Federal agencies are required to identify historic resources that may be affected and to avoid, minimize, or mitigate any adverse effects. The Section 106 regulations are codified in 36 CFR 800 and are available from the Advisory Council on Historic Preservation website at www.achp.gov. Regulations allow 30 days upon receipt for SHPO review.

The Antiquities Code of Texas (Title 9, Chapter 191 of the Texas Natural Resources Code) is intended to protect historic and archeological landmarks and is applicable to public lands owned by the state of Texas or a political subdivision of the state, including state agencies, counties, cities, school districts, and public colleges and universities, as well as other public authorities. Notification of the Texas Historical Commission is required before breaking ground at a project location on state or local public land.

☒ This is a new submission
Complete all pages of this form and include required attachments.

☐ This is additional information relating to original submission made on or about _____
Complete only the first page of this form and add any new information, including attachments.

1. Project Information

PROJECT NAME
Air Liquide - Cultural Resources Assessment Report

PROJECT ADDRESS	PROJECT CITY	PROJECT ZIP CODE(S)
11400 Bay Area Boulevard	Pasadena	77507

PROJECT COUNTY OR COUNTIES
Harris County

PROJECT TYPE (Check all that apply)

☐ Road/Highway Construction or Improvement	☒ Repair, Rehabilitation or Renovation of Structure(s)
☐ Site Excavation	☐ Addition to Existing Structure(s)
☒ Utilities & Infrastructure	☐ Demolition or Relocation of Existing Structure(s)
☐ New Construction	☐ None of these

BRIEF PROJECT SUMMARY: Please provide a one or two sentence description to explain the project. More details will be provided separately in Part 5, the Project Work Description Attachment.

Air Liquide Large Industries U.S., L.P. (Air Liquide) is seeking a Greenhouse Gas (GHG) permit under the Environmental Protection Agency's (EPA) Tailoring Rule authorizing the redevelopment of its cogeneration facility on Bay Area Boulevard in Pasadena, Texas, and the replacement of four (4) gas-fired turbines and three (3) gas-fired boilers with similar units.

2. Project Contact Information

PROJECT CONTACT NAME	TITLE	ORGANIZATION
Dave Port	Archeologist, RPA	ERM

ADDRESS	CITY	STATE	ZIP
15810 Park Ten Place suite 300	Houston	TX	77084

PHONE	EMAIL
770-315-1895	dave.port@erm.com

For SHPO Use Only **Date Stamp Below:**

Track Review to:

☐ Archeology Division: Reviewer:

☐ History Programs Division: Reviewer:

☐ Architecture Division: Reviewer:

3. Federal Involvement

Does this project involve approval, permit, license, or funding from a federal agency?

☑ Yes (Please complete this section) ☐ No (Skip to next box)

FEDERAL AGENCY
EPA - Region 6

FEDERAL PROGRAM, FUNDING, OR PERMIT TYPE:
GHG Permit

FEDERAL AGENCY CONTACT PERSON
Jeff Robinson

PHONE
(214) 665-7250

ADDRESS
U.S. EPA Region 6, 6PD
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

EMAIL
robinson.jeffrey@epa.gov

Has the federal agency (if other than HUD) formally delegated authority to consult with SHPO on the agency's behalf? ☐ Yes (Please attach delegation letter) ☑ No

4. State Involvement

Does this project involve approval, permit, license, or funding from a state agency?

☑ Yes (Please complete this section) ☐ No (Skip to next box)

STATE AGENCY
TCEQ

STATE PROGRAM, FUNDING, OR PERMIT TYPE:
minor New Source Review (minor NSR) requirements for GHG permits

STATE AGENCY CONTACT PERSON
unknown at this time

PHONE

ADDRESS

EMAIL

Will this project involve public land owned by the State of Texas or a political subdivision of the state? (State Agency, County, City, School District, Public Authority, Public College or University, etc.)

☐ Yes ☑ No

CURRENT OR FUTURE OWNER OF THE PUBLIC LAND

5. Project Work Description

Attach a detailed written description of the project that fully explains what will be constructed, altered, or demolished. Include architectural or engineering plans, site plans, specifications, or NEPA documents, as necessary, to illustrate the project.

6. Identification of Project Location and Area of Potential Effect (APE)

The APE includes the entire area within which historic properties could be affected by the project. This includes all areas of construction, demolition, and ground disturbance (direct effects) and the broader surrounding area that might experience visual or other effects from the project (indirect effects).

1. **Attach** map(s) indicating the location and specific boundaries of the project. Road names must be included and legible. Identify the project location, boundaries, and APE on the map(s) as precisely as possible. Suggested maps may include USGS 7.5 minute quadrangle maps (or relevant portions thereof), tax maps, satellite images, etc. The number and types of map(s) will depend on the nature and complexity of the project as well as the extent of the APE. **Projects involving ground disturbance must include the appropriate 7.5 minute USGS quadrangle.**
2. **Attach** a brief written description of the APE, including a discussion of the potential for direct and indirect effects that might result from the project and the justification for the boundaries chosen for the APE.

7. Identification of Historic Properties within the APE (Attach additional materials as necessary)

A. Archeological Resources

Does this project involve ground-disturbing activity?

☐ Yes (Please complete this section) ☒ No (Skip to Structures section)

Describe the nature, width, length, and depth of the proposed ground-disturbing activity.

Describe previous land use and disturbances.

Describe the current land use and conditions.

B. Structures

Are there any structures, buildings, or designed landscape features (park, cemetery, etc.) 45 years old or older within the project area or APE?

☐ Yes ☒ No

Is the project located within or adjacent to a district that is listed in or eligible for the National Register of Historic Places? Eligible districts may include locally designated districts or areas identified in historic resource surveys.

☐ Yes, name of district: _____ ☒ No ☐ Do not know

If the Texas Historic Sites Atlas (http://atlas.thc.state.tx.us) has been consulted, were previously identified architectural resources identified within the project area or APE?

☐ Yes ☒ No ☐ Did not consult Atlas

If the answer to any of the above questions is yes, use the space below or provide an attachment indentifying each structure, building, designed landscape feature, or district within the APE that is 45 years old or older. Include an actual or estimated date of construction and the location of each of the features.

Does the project involve the rehabilitation, alteration, removal, or demolition of any structure, building, designed landscape feature, or district that is 45 years old or older?

☐ Yes ☒ No

If yes, include information with the attachments for Part 5: Project Work Description and Part 8: Photographs.

8. Photographs

Attach clear, high-resolution color photographs that illustrate the project area and APE as defined in Section 6. Images from the internet are not acceptable due to low resolution. Photography should document the project area and properties within the APE, including clear views of any buildings or structures. Please number and label all photographs, and include a map or site plan labeled to show the location and direction of each view. Where applicable, include photographs of the surrounding area from the project site and streetscape images. Should your project entail the alteration of existing structures, please also provide photographs of the existing conditions of sites, buildings, and exterior and interior areas to be affected.

9. Consulting Parties/Public Notification (Section 106 only)

Attach a description of the actions taken to notify the public or invite consultation with parties other than SHPO. Provide a summary of any consultation and comments received from consulting parties or the public.

The SHPO is only one consulting party under Section 106. Refer to 36 CFR 800.2 for information about other participants who are entitled to comment on the Section 106 process, including Native American tribes, interested parties, and the public. Consultation with the SHPO is not a substitution for consultation with Native American tribes. When identifying historic resources within the APE and determining the effect of an undertaking, applicants should consider consulting with the county historical commission and the local historic preservation officer, if any.

10. Applicant's Determination of Effect (Section 106 only)

An effect occurs when an action alters the characteristics of a property that qualify it for listing in the National Register of Historic Places, including changes to the property's location, design, setting, materials, workmanship, feeling, and association. Effects can be direct or indirect, and can be physical, visual, audible, or economic. They may include a change in ownership or change in use.

- ■ **No Historic Properties Affected** based on 36 CFR 800.4(d)(1). Please provide the basis for this determination.
- ☐ **No Adverse Effect** on historic properties based on 36 CFR 800.5(b). Please explain why the criteria of adverse effect at 36 CFR 800.5(a)(1) were not found to be applicable for your project.
- ☐ **Adverse Effect** on historic properties based on 36 CFR 800.5(d)(2). Please explain why the criteria of adverse effect at 36 CFR 800.5(a)(1) were found to be applicable to your project. You may also wish to include an explanation of how these adverse effects might be avoided, minimized, or mitigated.

In the space below or as an attachment, please explain the effect of the project on historic properties.

A finding of No Effect as defined in 36 CFR 800.4(d)(1) is anticipated from the EPA for Air Liquide's Bayou Cogeneration Plant's proposed redevelopment of its cogeneration facility on Bay Area Boulevard in Pasadena, Texas. The finding is based on the absence of historic properties either listed on or eligible for inclusion to the NRHP as well as the absence of State Archeological Landmarks and other cultural resources within the Project's APE and indirect APE.

Submit Completed Form and Attachments to:

Via mail:
Mark Wolfe
State Historic Preservation Officer
Texas Historical Commission
PO Box 12276
Austin, TX 78711

Via hand delivery or private express delivery:
Mark Wolfe
State Historic Preservation Officer
Texas Historical Commission
108 West 16th St.
Austin, TX 78701

Faxes and email are not acceptable.

For SHPO Use Only

PROJECT NAME		
Air Liquide - Cultural Resources Assessment Report		
PROJECT ADDRESS	PROJECT CITY	PROJECT ZIP CODE(S)
11400 Bay Area Boulevard	Pasadena	77507
PROJECT COUNTY OR COUNTIES		
Harris County		

PROJECT CONTACT NAME	TITLE	ORGANIZATION
Dave Port	Archeologist, RPA	ERM
ADDRESS	CITY	STATE / ZIP
15810 Park Ten Place suite 300	Houston	TX 77084
PHONE	EMAIL	
770-315-1895	dave.port@erm.com	

From: Dumaual, Alfred [mailto:Dumaual.Alfred@epa.gov]
Sent: Monday, October 21, 2013 10:49 AM
To: Kurtis Schlicht; Wilkins, Tim
Cc: Wilson, Aimee; Robinson, Jeffrey
Subject: Air Liquide Bayport GHG Permit - SHPO Concurrence with minor edit

Hi Tim/Kurtis-

The SHPO has concurred with the finding of the cultural report for the Air Liquide Bayport project. However, they did have one minor request as an edit to the report concerning the authorship of the document. Please see attached letter and make the change as we would like to proceed forward with issuance of the permit. If you have any questions, let me know.

Thanks,

AC

Alfred C. "A.C." Dumaual, Ph.D.

U.S. EPA Region 6
Air Permits Section (6PD-R)
1445 Ross Avenue
Dallas, TX 75202
(214) 665-6613
dumaual.alfred@epa.gov

TEXAS HISTORICAL COMMISSION
real places telling real stories

September 30, 2013

Jeff Robinson
Section Chief
Air Permits Section
United States Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Attention: A.C. Dumaual

Re: Project review under Section 106 or the National Historic Preservation Act
Draft report: *Report for the Finding of No Effect to Archeological and Historic Resources Associated with Air Liquide's Bayou Cogeneration Plant's Proposed Project, Pasadena, Harris County, Texas.* (EPA)

Dear Mr. Robinson:

Thank you for allowing us to review the report referenced above. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Bill Martin, has completed its review. After reviewing the documentation, we concur that the proposed project is unlikely to affect historic properties. Construction may proceed without further consultation with this office.

Our only comment that needs to be addressed in the final report is that the title page should list the name of the author, which we assume is the principal investigator. We look forward to receiving the final report along with an electronic version in the form of a tagged PDF. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If we may be of further assistance, please call Bill Martin of our staff at 512/463-5867.**

Sincerely,

for
Mark Wolfe, State Historic Preservation Officer

MW/wam

Resume Of Principal Investigator

Appendix D

October 25, 2013
Project No. 0151579

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000

Dave Port, RPA

Cultural Resources Consultant - IAP

Mr. Dave Port is a Cultural Resources Consultant within ERM based in the Houston office (Southwest Division) and is part of the Environmental Impact Assessment and Planning (IAP) Group. He has over 13 years of cultural resource management (CRM) experience field directing and project managing various archaeological investigations as well as participating in the development/planning of community-based support initiatives for programs concerning advocacy, education, interpretation, and self-governance/ management. Further, he has worked with over a dozen State Historic Preservation Officers (SHPOs) across the Mid-Atlantic, Southeastern and Southwestern states. He has over 20 years of combined experience in historical research, architectural history, and archaeological fieldwork with a primary emphasis in archaeology and with over 80 projects/reports that he has field directed, completed, and published. He also has extensive experience with impact assessments, agency consultations, and project management.

Mr. Port has completed work for and consulted with the following state and federal agencies: Georgia Department of Transportation (GDOT); Alabama Historical Commission (AHC); Federal Highway Administration (FHWA); U.S. Army Corps of Engineers (USACE) Districts in Mobile, AL; Jacksonville and Clewiston, FL; Wilmington, NC; and Savannah, GA; U.S. Department of the Army at Fort Bragg, NC, and Fort McClellan, AL; National Park Service (NPS) Southeast Region; U.S. Department of Agriculture – National Forest Service (NFS): Nantahala District, NC; Sumter, Long Cane, and Enoree Districts, SC; and Chattahochee District, GA; and the U.S. Fish and Wildlife Service (FWS). He has also consulted with various natural gas pipeline companies including Williams Gas – Transco and East Tennessee Natural Gas (ETNG).

Professional Affiliations & Registrations

- Register of Professional Archeologists (RPA), 2002 –
- Georgia Council of Professional Archeologist (GCPA), 2001 –

Fields of Competence

- Historical Archeology
- Industrial Archeology
- Southeastern Archeology
- Plantation Archeology
- African American Archaeology
- Highland Mayan/Central American Archeology
- Ethnographies and Oral Histories and TCPs
- HABS/HAER Documentation
- Architectural History
- NEPA Documentation/Analyst/Reviewer

Education

- MA, Anthropology, Northern Arizona University (1999)
- BA, History, University of Alabama at Birmingham (1993)

Professional Training

- Georgia DOT Certificates in NEPA Documentation; Archaeology; and Historic Resources
- 24-Hour OSHA HAZWOPER

Professional Memberships

- Archaeological Society of South Carolina (ASSC), 2010 –
- Archaeological Institute of America (AIA) (North Alabama chapter), 2010 –
- Alabama Archaeological Society (AAS), 2009 –
- Southeastern Archaeological Conference (SEAC), 2003 –
- Society of Georgia Archaeology (SGA), 2001 –
- Society for Historical Archaeology (SHA), 2010-
- Society for American Archaeology (SAA), 2010-
- Council of Texas Archeologists (CTA), 2012-

Key Projects

- ***Haile Gold Mine Site, Lancaster Co., SC.*** Phase I and 13 site Phase II investigations conducted for Romarco Minerals Co., Toronto, Canada, in cooperation with R.S. Webb & Associates, Holly Springs, GA, 2011-12 – please see: http://www.heraldonline.com/2011/04/01/2954685/epa-opposes-gold-mine.html?storylink=addthis
- ***Blair Mountain, Piney Branch Mountain Top Coal Removal Survey, Logan Co., WV.*** Phase I investigation conducted for the Aracoma Coal Co., WV, for the contested Blair Mountain National Register (NR)-eligible battlefield site in cooperation with Paciulli, Simmons & Associates, Ltd. (PSA Ltd.), Fairfax, VA, 2011 – please see: http://blogs.wvgazette.com/coaltattoo/2009/07/06/blair-mountain-news-its-coming-of-the-list/
- ***Vanderbilt Mansion, Hyde Park, New York.*** Phase II Investigation conducted for the NPS in cooperation with PSA Ltd., 2011.
- ***GDOT's Transportation Enhancement (TE) Projects Environmental Coordinator, Atlanta, GA.*** Managed environmental compliance/NEPA regulations on over 150 TE Projects statewide in coordination with GDOT, FHWA, SHPO/HPD, and FWS, totalling over $60 million, Fiscal Year 2010-11.
- ***7.5 Miles Archeological Survey for the Roy Taylor Roads Project: Nantahala National Forest, Jackson County, North Carolina***. Contract # AG-4568-S-10-0009. Submitted to the National Forests in North Carolina, Nantahala District, 2010.
- ***EBI Consulting, Inc., Subcontractor Archaeologist – T-Mobile Cell Towers, MD & GA,*** 2009.

Selected Publications

2011 ***The Spiritual Flash: A Glass Filled Chimney at Site 1MA748*** by Diana Valk and J.W. Joseph, PhD, New South Associates. In ***Stones & Bones – The Newsletter of the AAS***, Vol. 53, Issue 2, March 2011, pp. 4-5.

2009 ***Joys and Sorrows of This Passing Life: African American Archeological Investigations at the 1818 Hickman Log Cabin and the Cook's House at Pond Spring Plantation (1LA663), Lawrence County, Alabama*** (in review: Cultural Heritage Study Series, University of Florida Press).

2009 ***Cultural Resources Survey Strategy for the Comprehensive Everglades Restoration Project (CERP) for Southern Florida*** - http://newsouthassoc.com/notable/everglades.html

As part of the Everglades Restoration Act (2000), a monumental 30-year undertaking involving 18,000 square miles of South Florida and at an estimated cost of 7.8 billion dollars, the CRM plan was submitted to the Florida Bureau of Archaeological Research, the USACE, Jacksonville and Clewiston Districts, FL, and the South Florida Water Management District.

2004 ***Historical Archaeology in Georgia***. J. W. Joseph, Theresa M. Hamby and Catherine S. Long of New South Associates. Contributions pages 90-1, 251. Submitted to Georgia Archaeological Research Design Paper No. 14, University Of Georgia (UGA) Laboratory of Archaeology Series, Report Number **39**, Athens, GA. Report Prepared for the GDOT and the Historic Preservation Division (HPD), Georgia Department of Natural Resources (DNR). http://www.valdosta.edu/~aesanfor/historical%20architecture.pdf

2004 ***The History of Lake Okeechobee: Headwaters of the Everglades and the Origins of the Okeechobee Waterway***. Level II HABS/HAER documentation of Okeechobee Intercoastal Waterway, submitted to National Park Service (NPS) Southeast Regional Office, Tallahassee, FL, presented at the 2001 Congressional Hearings for the Everglades Restoration Project by the USACE, Jacksonville District, FL.

2003 ***Thirteen Site Phase II Testing and Evaluation, Fort Bragg, North Carolina***. John Cable, Dave Port, Carl Steen, and Charles Cantley of Palmetto Research Institute (PRI), SC. Report submitted to U.S. Department of the Army, Fort Bragg, NC, and the NPS, Southeast Regional Office, Tallahassee, FL. Contract # C5890020435. Online at www.PalmettoHistory.org South Carolina Archaeology Reports - http://www.palmettohistory.org/archaeology/ftbraggSM3.pdf

1999 ***Collecting Close to Home: Local and Family Histories From Southside, Flagstaff Minority Residents: 1930s-1950s***. MA Thesis and Final Integrative Project, Northern Arizona University (NAU), published in cooperation with Pioneer Historical Society, Flagstaff, AZ.