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Cultural Resources Reconnaissance-Level Survey of the LCRA–SAWS Water Project Colorado, Matagorda, and Wharton Counties, Texas

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CULTURAL RESOURCES RECONNAISSANCE-LEVEL SURVEY OF THE LCRA–SAWS WATER PROJECT COLORADO, MATAGORDA, AND WHARTON COUNTIES, TEXAS

TEXAS ANTIQUITIES PERMIT NO. 3797

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Management Summary

Atkins conducted a reconnaissance-level cultural resources survey and constraints analysis on behalf of the Lower Colorado River Authority (LCRA) and the San Antonio Water System (SAWS). The LCRA-SAWS Water Project (LSWP) was a partnership aimed at developing a plan to provide a reliable water supply (up to 150,000 acre-feet/year) to San Antonio for 40 years, with an option for 30 additional years, and to provide a more reliable long-term water supply for the lower Colorado River basin while protecting and benefiting said river basin.

The purpose of this study was to assist LCRA and SAWS in their compliance with the Antiquities Code of Texas and Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. The records review was performed by professional archeologists meeting the Secretary of the Interior standards and identified potential cultural resources that may be encountered by the proposed project. A reconnaissance-level survey was performed by archeologists and professional historians to verify the results of the records review and to identify any additional resources observed in the field. Participants included Clell Bond, Michael Nash, Meg Cruise, Wayne Glander, Tricia Blackistone, Sally Victor, and Robert Rogers. Atkins obtained Antiquities Permit No. 3797 in compliance with the Antiquities Code of Texas to conduct the survey. This permit was for an intensive survey; however, the project was cancelled before one occurred.

Because the exact size of the footprint of the potential infrastructure was never finalized, the archeological resources assessment initially focused on a study area spanning three counties. Eventually, the study area was narrowed to a handful of potential sites, but a final alignment or reservoir locations were never determined. The project shut down before the intensive survey began; therefore, the entire project area will need to be surveyed archeologically should the project resume in the future.

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I. INTRODUCTION

Atkins conducted this study to assist the Lower Colorado River Authority (LCRA) and the San Antonio Water System (SAWS) in their compliance with the Antiquities Code of Texas (ACT) and Section 106 of the National Historic Preservation Act (NHPA). The records review was performed by professional archeologists meeting the Secretary of the Interior standards and identified potential cultural resources that may be encountered by the proposed project. A reconnaissance-level survey was performed by archeologists and professional historians to verify the results of the records review and to identify any additional resources observed in the field. Atkins obtained Antiquities Permit No. 3797 in compliance with the ACT to conduct an intensive survey; however, because the project was cancelled and the intensive survey was not performed, the entire project area will need to be surveyed archeologically should the project resume in the future.

The LCRA and SAWS selected several consulting and engineering firms to develop and study the LCRA-SAWS Water Project (LSWP) within Colorado, Wharton, and Matagorda Counties. As one part of this multi-faceted project, the Facility Siting Design and Affected Environment Team (FSE Team) of which Atkins was a part, was created to evaluate the infrastructure within the lower Colorado River basin to transfer water to San Antonio. These infrastructure components include intakes to divert water from the Colorado River, off-channel storage, pump stations, and water transmission pipelines to convey the water to the western boundary of the LCRA service area or another delivery point, which is the contractual location where responsibility for water conveyance would have transferred from LCRA to SAWS (Figure 1).

As part of this process, Atkins cultural resources staff reviewed records for Colorado, Wharton, and Matagorda Counties to guide a limited archeological field reconnaissance for each alternative, while being confined to areas that were publicly accessible. Based on the results of the records review and the field reconnaissance efforts, Atkins historians and archeologists quantified known and potential cultural resource sites for 18 Off-Channel Storage Facilities (OCSF), 9 Intake Facilities (IF), 13 Intake Pipelines (IP), and 14 Transmission Facilities (TF) (Figures 2 through 7). Cultural resources staff developed impact sensitivity ratings for each facility according to the number of historic building resources and the likelihood of encountering buried, intact archeological resources within each facility location.

BACKGROUND

In 2003, the LCRA and SAWS partnered to develop a plan to provide a reliable water supply (up to 150,000 acre-feet/year) to San Antonio for 40 years, with an option for 30 additional years, and provide a more reliable long-term water supply for the lower Colorado River basin while protecting and benefiting said river basin. In order to achieve this goal, the partnering entities began studying the water supply project known as the LCRA-SAWS Water Project or the LSWP.

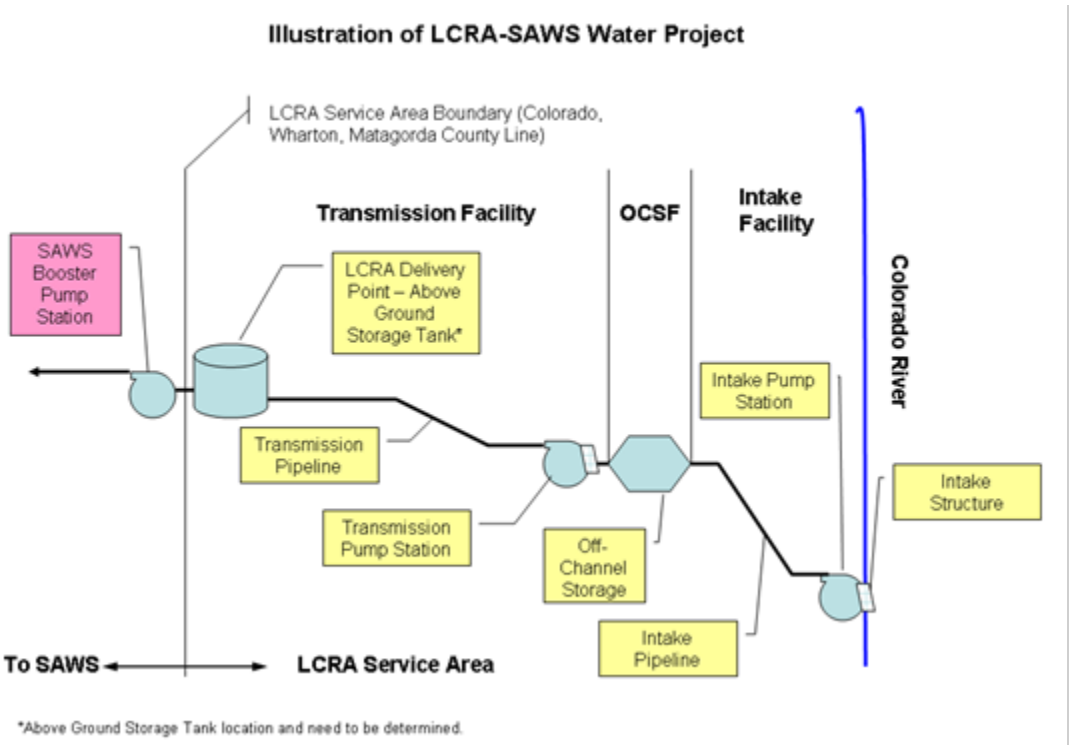

Figure 1: Schematic of LSWP components.

In 2004, the FSE Team began to collect data from publicly available sources. The FSE Team performed a database and public records search of information describing Colorado, Wharton, and Matagorda Counties, specifically for information related to selecting potential facility sites and pipeline routes favorable for construction and operation of the infrastructure components. This effort produced a comprehensive database that served to prepare preliminary constraints maps for the LSWP study area. These maps identified locations in the study area where environmental features, different soil types, and cultural resource constraints were located.

From these preliminary constraints maps, the team developed Conceptual Alternative Projects for evaluation and the eventual selection of a preferred project location. An off-channel storage facility (OCSF) serves as one component of each Conceptual Alternative Project. The number of OCSF sites was reduced from the 14 identified at the end of 2005 to 8 modified ones. After the completion of a public outreach program, additional locations for potential OCSF sites were identified. The identification of additional and modified off-channel storage facility sites resulted in the development of seven Conceptual Alternatives, three of which were carried forward for comparison with the original eight that were developed prior to the public outreach program. Each OCSF has three additional component parts: intake facilities, intake pipelines, and transmission facilities. The majority of these had already reviewed as potential facility and pipeline sites. The four additional OCSFs were not within any of the previously investigated areas; however, the LSWP was canceled before a final location could be selected and additional, more intensive, work could be conducted.

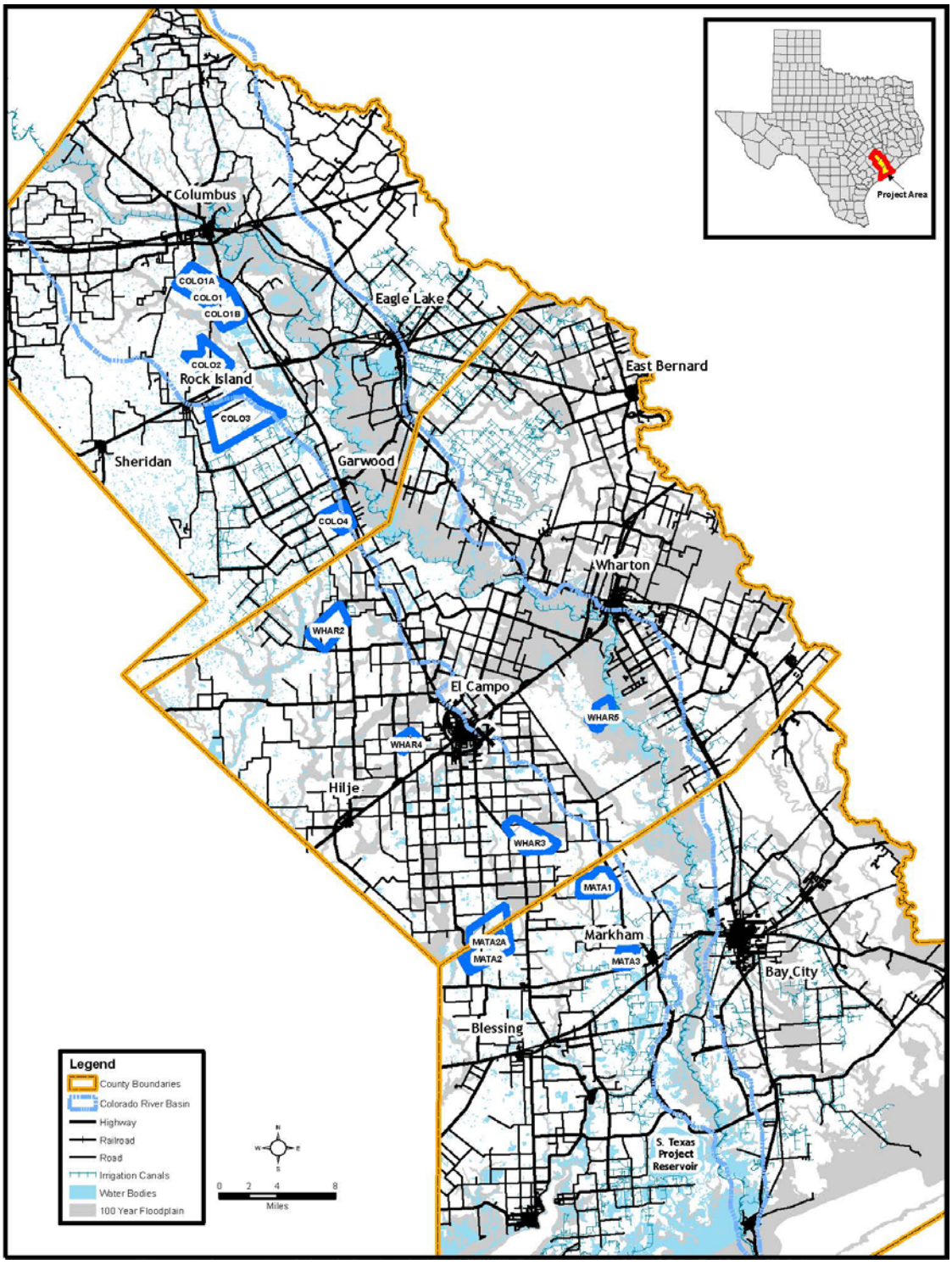

Figure 2: LSWP 2006 Off-Chanel Storage Locations, including the original Wharton OCSF.

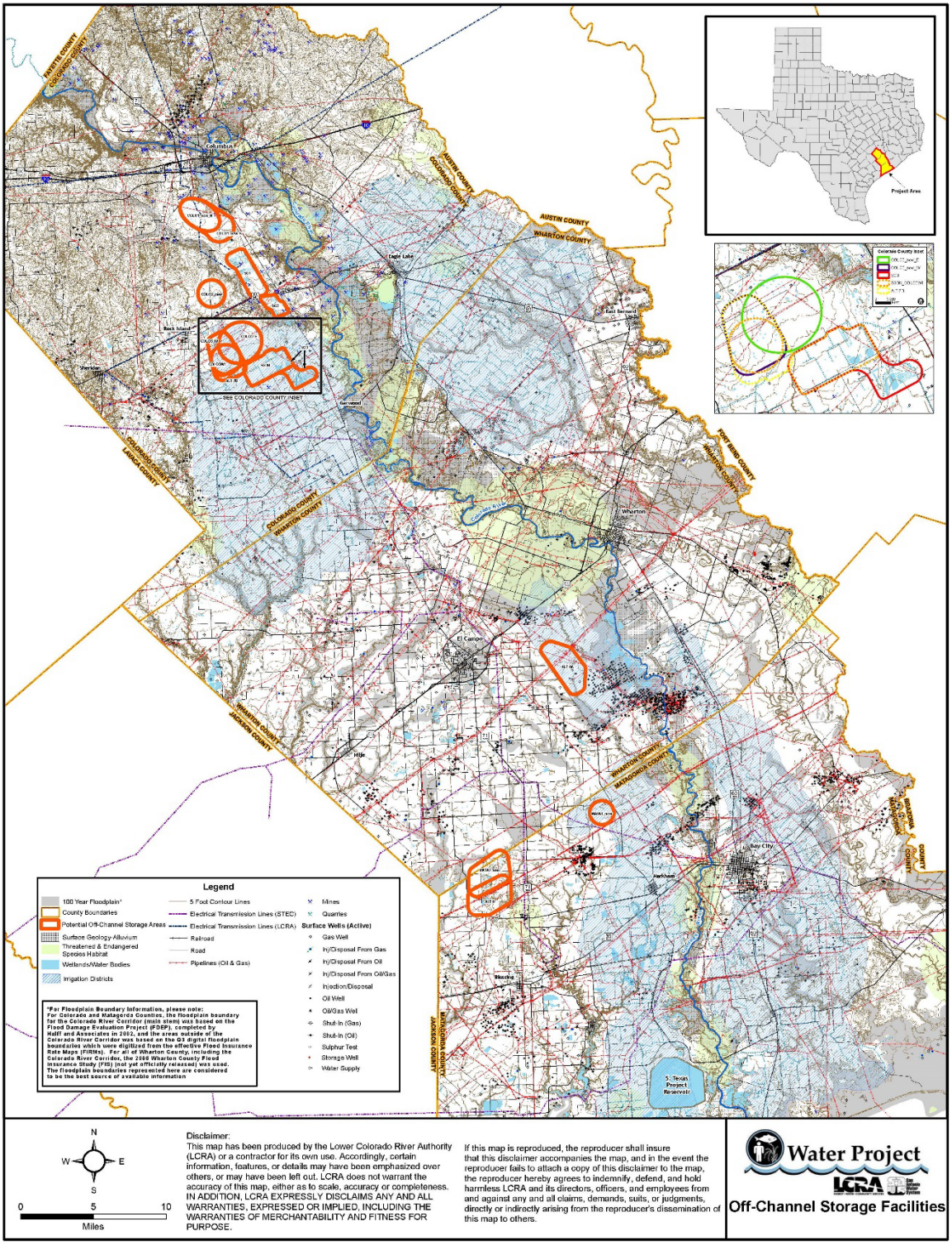

Figure 3: LSWP 2007 Off-Chanel Storage Locations.

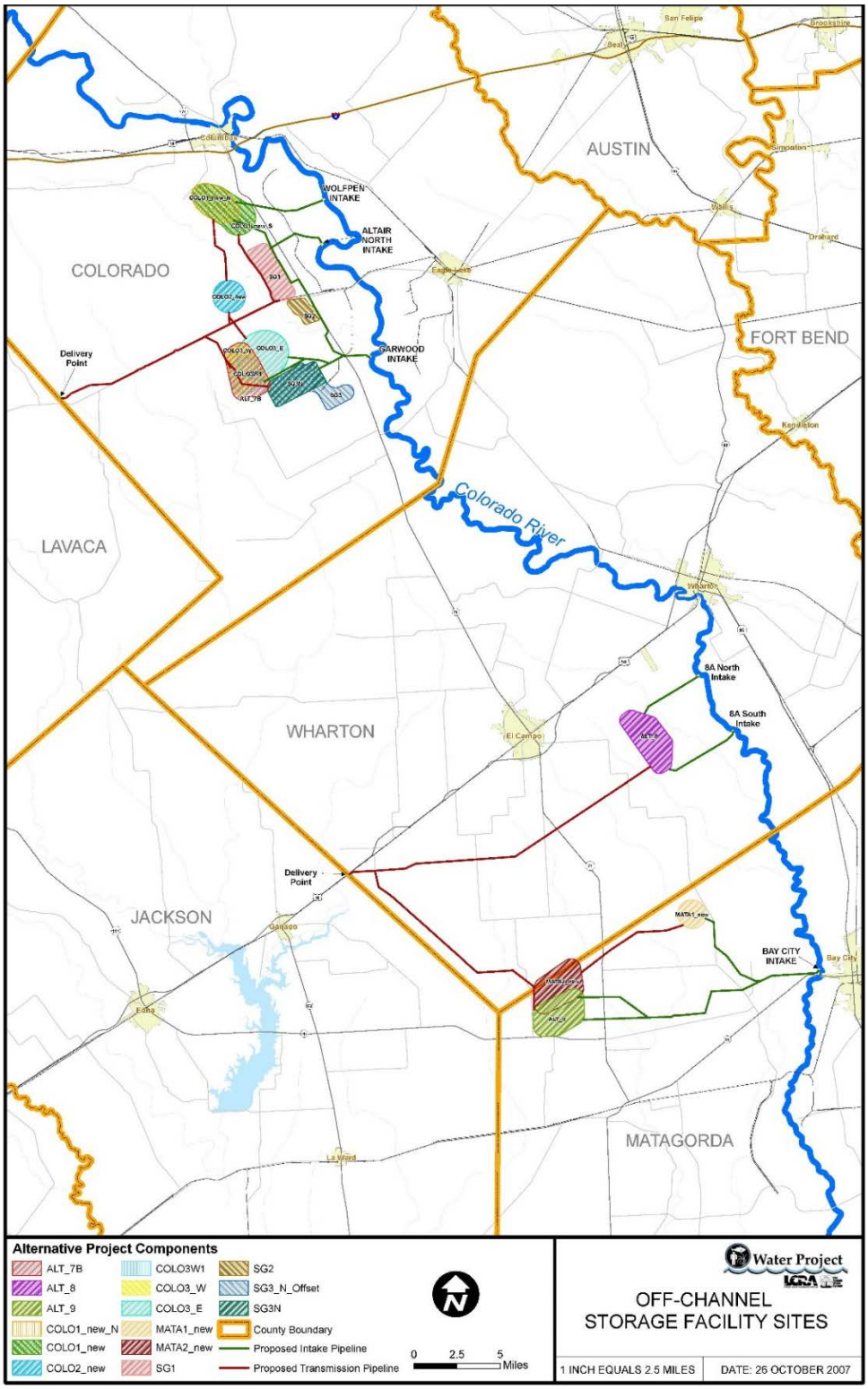

Figure 4: Off-Channel Storage Facility sites in all three counties with proposed intake and transmission pipelines.

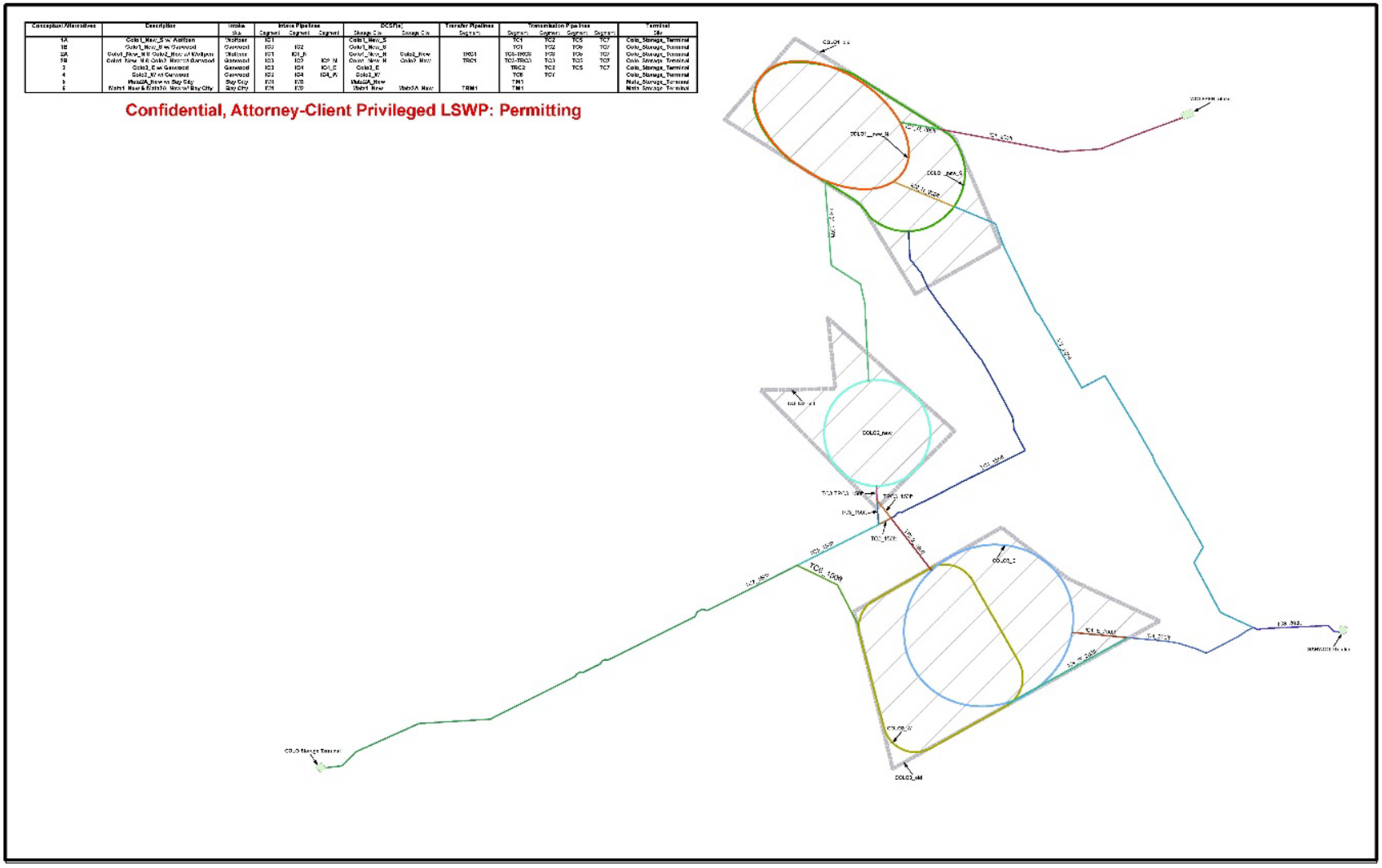

Figure 5: Colorado County close up showing original and alternative OCSF locations.

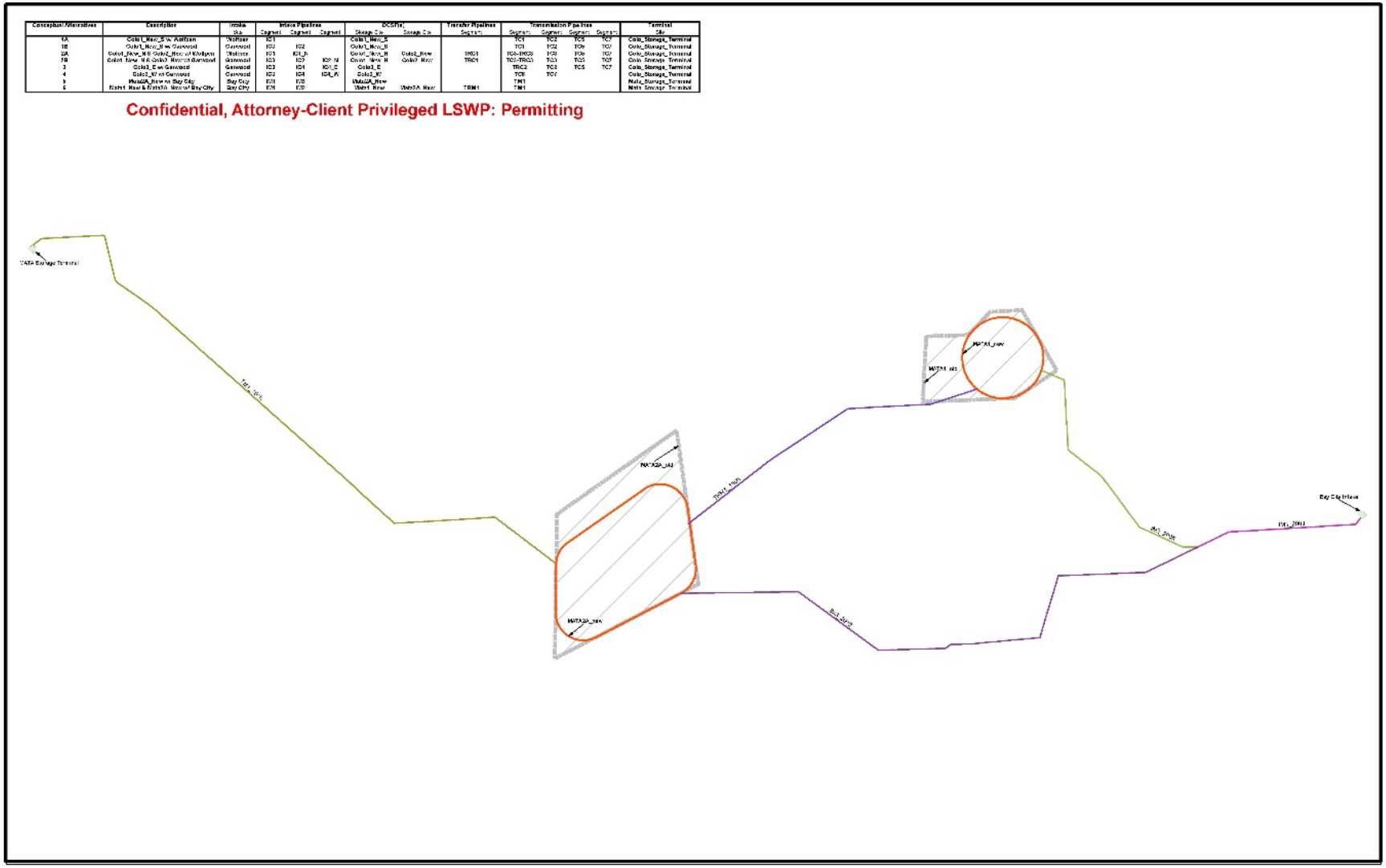

Figure 6: Matagorda County close up showing original and alternative OCSF locations.

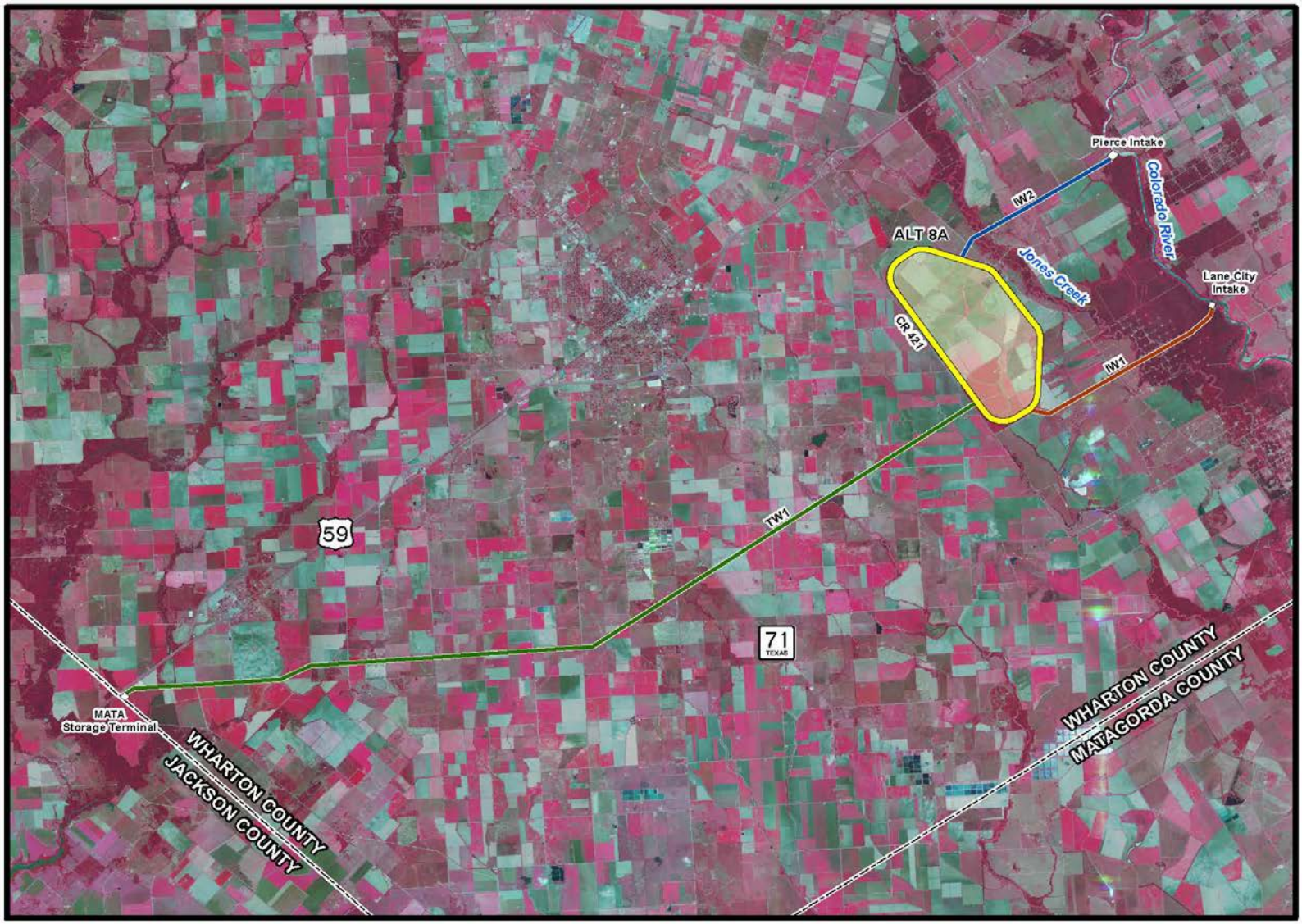

Figure 7: Wharton County close up of Peirce Ranch components.

II. RESEARCH DESIGN

The investigations conducted to identify existing and potential archeological constraints were threefold, comprising a records review, assessment of High Probability Areas (HPAs), and aerial and ground-based verification techniques. The methods for these efforts are described below.

RECORDS REVIEW

A records review was conducted of the files and maps at the Texas Archeological Research Laboratory (TARL), the Texas Historical Commission's (THC) on-line Restricted Archeological Sites Atlas (Atlas), the National Register of Historic Places (NRHP) database, and Geographic Information System (GIS) analyses. Staff historians consulted the Texas Historic Sites Atlas and maps at the THC to locate previously recorded historic sites including State Antiquities Landmarks, National Register Properties, Official State of Texas Historical Markers, Registered Texas Historic Landmarks, and historic cemeteries. In addition, modern aerial photographs were examined, as well as historical maps of the area. The results of the background records review were integrated into a GIS database.

IDENTIFICATION OF HIGH PROBABILITY AREAS FOR CULTURAL RESOURCES

The determination of probability areas was based on a predictive model that took into account numerous variables, including topography (gradient of slope), landform, soils, and distance to water (hydrology), elevation, roads, and disturbances. Most of these variables were chosen because they have been previously identified as proxies for human spatial decisions for habitation locations. These variable address access to water, food, and raw materials, as well as integrity of deposits. HPAs for cultural resources are portions of the study area that may possess a relatively higher potential for harboring historic or prehistoric archeological sites. The predictive model depended heavily on information from maps of the project area (both topographic and aerial), U.S. Department of Agriculture's Soil Conservation Service county soil surveys, other soil information, and the results of the records review research. By using proximity to known archeological sites and various topographic factors previously mentioned, archeologists were able to identify areas that had a perceived high probability of containing cultural resources. Both potentially historic structures and archeological resource localities were considered discrete entities for inclusion in the HPA.

FIELD VISIT

An archeological reconnaissance of the study areas was used to ground-truth the HPAs that were defined from the maps, photographs, and soil information sources. Following preliminary design of the alternate facility components, aerial and ground-based reconnaissance investigations were conducted to visually confirm potentially historic structures and areas thought to have a high potential for prehistoric archeological resources. The field reconnaissance efforts were limited to publically accessible rights-of-way and areas visible during a helicopter flyover.

HIGH PROBABILITY AREAS

The locations of HPAs were first identified from a desktop review and then modified during the field visit. In order to translate these HPAs into numeric values to be incorporated into the overall constraints analysis, project archeologists calculated the percentage of area within each alternate with a high probability for the presence of archeological sites. After identifying HPAs, they calculated the number of acres it encompassed. Archeologists then used these acreage totals for each reservoir or corridor to calculate the percentage of the reservoir or corridor that would have a high probability for prehistoric sites. This percentage was entered into an Alternative Evaluation Matrix (AEM) for each alternate and used, along with the historic resource constraints, to develop the impact sensitivity rating for each alternate facility. Relatively little of the study area has been previously subjected to systematic archeological survey, suggesting that the actual number of sites existing within the study area may be substantially underrepresented by the current number of known sites.

III. RESULTS

The results of the constraints analysis vary according to resource type (historic or prehistoric) and the type of component required for the project (Tables 1 through 4). For example, construction of underground linear components (intake or transmission lines) may have little visual impact to nearby surface-level historic resources, but they are problematic for subsurface archeological resources. If construction of these components occurs aboveground, the situation would likely be reversed, with less effect to archeological resources, but potentially significant visual impacts to historic properties.

Construction of a reservoir will have a direct and permanent adverse effect on both archeological and historical resources located inside the reservoir boundaries. Thus, impacts to resources within the footprint of the alternate facilities strongly influenced the impact sensitivity ratings applied to each facility. The visual impact of a grass-covered levee around the reservoirs was considered in the impact sensitivity analysis. However, indirect visual impacts to historic resources located within 0.5 mile of the alternate facilities were not considered to be as severe as the direct impacts to resources within the footprint of reservoir and transmission facilities.

In addition to these concerns, reservoir construction also would have a direct effect on historic agricultural landscapes that may extend into or beyond the limits of the reservoir. Rural agricultural landscapes are recognized by the Secretary of the Interior as a property type that may be eligible for NRHP listing. For this part of Texas, such landscapes typically reflect either crop cultivation or livestock ranching practices that continue today much as they have for more than a century. Noteworthy cultural features include extensive irrigation canal and road systems, small farmsteads dispersed around a more densely built town or community center, and ranches that often extend across large areas.

Generally, agricultural land use characterizes all of the alternate reservoir facilities. Thus, any of the alternate facilities could alter to some extent the agricultural features land use patterns that are common across the study area today. However, several alternates may impact distinctively older European farming patterns that are closely associated with older European immigrant settlements, e.g., Danevang and Nada. Another noteworthy example is the Pierce Ranch, surrounding the Wharton 5 alternative area. Although the 36,000-acre Pierce Ranch has not yet been listed in the NRHP, evaluation of this large ranch represents a complicated and time-consuming effort.

The number of off-channel storage sites was reduced from the 14 identified at the end of 2005 to 8 modified off-channel storage sites (Colo1_New_N, Colo1_New_S, Colo2_New, Colo3_E, Colo3 _W, Mata1_New, Mata2_New and Mata2A_New). All of these were within the footprints of the original 14 areas. After a public outreach program, additional locations for potential off-channel storage sites were identified (SG1, SG2, and SG3). These were outside of the original OCSF footprints and required additional background review research. The additional and modified off-channel storage facility sites

resulted in the development of seven Conceptual Alternative Projects which were based on the original facility and pipeline locations (7A, 7B, 7C, 7D, 8A-1, 8A-2, and Mata 2A). All of these were variations of previously reviewed areas (see Figures 2 through 7). None of these study areas was ever finalized; thus, no intensive survey was conducted prior to the cancelation of the project. Therefore, the entire project area will need to be surveyed archeologically should the project resume in the future.

OFF-CHANNEL STORAGE FACILITIES

The off-channel storage facility, electrical substation and maintenance warehouse (as well as supporting OCSF ancillary facilities) are considered part of the OCSF. There are a total of 18 OCSF reviewed for this study (see Figures 2 and 3). Elements SG1–SG3 and Alt8A-Pierce were added later into the constraints analysis process and contained no previously reviewed areas. All other versions of the project subsequently developed through the process were variations of these OCSFs and no variation extended outside of these footprints.

Table 1. Records Search Results for the Off-Channel Storage Facilities Organized by County

Name	County	Acreage of HPA	Archeological HPA %	Results for both Historic and Prehistoric Records Searches
Colo1	Colorado	1,202	19.8	There is only 1 recorded property within 0.5 mile. According to historic maps, there are 5 potential historic properties located within the footprint and 41 located within 0.5 mile of the footprint. The potential for prehistoric archeology is relatively low; only 1,202 acres, or 19.8% of the entire footprint, have a high probability for locating archeological sites.
Colo1A	Colorado	817	22.3	There are 2 potential historic properties in this area. Within 0.5 mile, there is 1 recorded property and 34 potential historic properties. Potential prehistoric archeological resources are highly likely within approximately 817 acres, or 22.3% or the total area.
Colo1B	Colorado	385	16	Historic maps suggest there are 3 potential historic properties within this area. They also indicate there are 7 potential historic properties within 0.5 mile of this footprint, although there are no already recorded properties within this 0.5 mile area. 385 acres, or 16% of the total footprint, have a high probability for the occurrence of these resources.
Colo2	Colorado	1,439	49.1	There are 4 potential historic properties within the footprint, and another 13 properties within 0.5 mile of the footprint. In addition to these properties, there is an extensive canal system that runs through the area and may comprise a

Name	County	Acreage of HPA	Archeological HPA %	Results for both Historic and Prehistoric Records Searches
				historic landscape. There is potential for prehistoric archeological resources within the footprint of this site; approximately 1,439 acres, or 49.1% of the entire acreage, contain a high probability of prehistoric resources.
Colo3	Colorado	1,151	16	Within the storage facility footprint, there are 11 potential historic properties/historic archeological resources. Another 8 potential historic properties lie within 0.5 mile of the footprint. The potential for prehistoric archeological resources within the footprint is low; about 1,151 acres, or 16% of the total acreage, have a high probability of containing prehistoric resources.
Colo4	Colorado	23	1.5	There are 16 potential resources within the footprint. There are 4 recorded resources and 107 potential historic resources (including 2 towns that are counted as 1 resource each, but contain multiple potential resources) within 0.5 mile of the footprint. Approximately 23 acres, 1.5% of the total acreage, have a high probability of containing prehistoric archeological resources.
SG1	Colorado	336.1		There are no recorded historic properties or cemeteries within the storage facility footprint. There are no recorded properties within 0.5 mile. According to historic maps, there are no potential historic properties located within the footprint and zero located within 0.5 mile of the footprint; 336.1 acres have a high probability for containing prehistoric archeological sites.
SG2	Colorado	350.9		There are no recorded historic properties or cemeteries within the storage facility footprint. There are no recorded properties within 0.5 mile. According to historic maps, there are no potential historic properties located within the footprint and 10 located within 0.5 mile of the footprint; 350.9 acres have a high probability for containing prehistoric archeological sites.
SG3	Colorado	598		A large part of OCSF SG3 was previously used as a gravel pit and already destroyed. There are 4 potential historic properties located within the footprint and 13 located within 0.5 mile of the footprint; 598 acres have a high probability for containing prehistoric archeological sites.
Whar2	Wharton	326	25.1	There are 6 potential historic properties within the storage facility footprint and 18 potential historic properties within 0.5 mile of the footprint. Analysis of the potential for prehistoric

Name	County	Acreage of HPA	Archeological HPA %	Results for both Historic and Prehistoric Records Searches
				archaeological resources reveals that 326 acres, or 25.1% of the total footprint acreage, have a high probability of containing archeological sites.
Whar3	Wharton	1,496	50.3	There are 7 potential historic properties within the footprint and 26 potential historic properties (including the historic town of Danevang, counted as only 1 resource but potentially containing a large number of historic resources) within 0.5 mile of the footprint. The prehistoric archaeology analysis revealed that approximately 1,496 acres, or 50.3% of the total footprint acreage, has a high potential to contain prehistoric archeological resources.
Whar4	Wharton	48	5.2	Within the footprint, there are 12 potential historic resources, and within 0.5 mile of the footprint, there are 13 potential historic resources. About 48 acres, or 5.2% of the total footprint acreage, have a high probability of prehistoric resources.
Whar5	Wharton	63	4.9	Low percentage of archeological HPA (4.9%) and a null count for historic features, because it is located within the historic Pierce Ranch, a large ranch that has never been formally evaluated for NRHP eligibility but which may qualify as such if fully evaluated. There are 5 potential historic properties located within 0.5 mile of the footprint.
Alt 8A – Pierce	Wharton	1,386	33	Pierce Ranch is a large ranching property with potential historical significance as a large agricultural landscape. The ranch both occupies and surrounds the entire footprint of this alternative. Additionally, 15 potentially historic buildings, structures, objects, or features that are part of the Pierce Ranch are predicted within 0.5 mile of the footprint. The potential for prehistoric archeology is 33% of the entire footprint, a high probability for containing prehistoric archeological sites.
Mata1	Matagorda	1,118	47.4	There are 5 potential historic properties within the footprint, and 9 potential historic properties within 0.5 mile of the footprint. Approximately 1,118 acres, 47.7% of the total footprint acreage, have a high potential for containing prehistoric archeological resources.
Mata2	Matagorda	428	14.2	There are 7 potential historic properties located within the footprint, and 4 potential historic properties within 0.5 mile of the footprint. The potential for prehistoric archaeological resources

Name	County	Acreage of HPA	Archeological HPA %	Results for both Historic and Prehistoric Records Searches
				within the footprint is low as well; approximately 428 acres, or 14.2% of the total acreage, have a high probability of containing prehistoric archeological resources.
Mata2A	Matagorda	1,587	29.1	There are 8 potential historic properties within the footprint, and 8 potential historic properties within 0.5 mile of the footprint. Approximately 1,587 acres, 29.1% of the total footprint acreage, have a high potential for containing prehistoric archeological resources.
Mata3	Matagorda	108	11	Within the footprint there is 1 potential historic property, and within 0.5 mile of the footprint, there are 10 potential historic properties. The acreage with a high potential for prehistoric archaeological resources is low as well; approximately 108 acres, or 11% of the total footprint acreage, are high probability.

INTAKE FACILITIES

In general, the channel dam, intake facility, intake pump station, raw water pipeline and warehouse (as well as supporting intake ancillary facilities) are considered part of the Intake Facility (see Figures 4 through 7). Initially, seven intakes were identified and reviewed, then the Wolfpen and Altair intakes were added. While Lakeside intake was discussed (and reviewed) in the initial internal memorandums; unfortunately, there are no existing records as to its location.

Table 2. Records Search Results for the Intake Facilities

Name	County	Acreage of HPA	Archeological HPA %	Results for Both Historic and Prehistoric Records Searches
Lakeside Intake	Unknown	10	100	There are no potential resources located within the facility footprint, and only 1 potential resource located within 0.5 mile of the intake facility. However, the entire 10-acre site (100%) has a high probability for containing prehistoric archeological resources.
Garwood Intake	Colorado	6	60	There are no potential historic resources located within the facility footprint, and only 1 potential historic resource within 0.5 mile of the intake facility. Approximately 6 acres, or 60% of the total acreage, have a high

Name	County	Acreage of HPA	Archeological HPA %	Results for Both Historic and Prehistoric Records Searches
				probability of containing prehistoric archeological resources.
Colo4 Intake	Colorado	8	80	There are no recorded historic properties or cemeteries within the facility footprint or within 0.5 mile of the footprint. There is 1 potential historic property located within the facility footprint, but there are no potential historic properties within 0.5 mile of this footprint; 8 acres, or 80% of the total footprint acreage, have a high probability of containing prehistoric archeological resources.
Whar2 Intake	Wharton	10	100	There are no recorded historic properties or cemeteries within the facility footprint or within 0.5 mile of the footprint. There is only 1 potential resource within 0.5 mile of the intake facility. However, the entire 10-acre site (100%) has a high probability for containing prehistoric archeological resources.
Whar4 Intake	Wharton	10	100	There are no recorded historic properties or cemeteries within the facility footprint or within 0.5 mile of the footprint. There are 6 potential historic resources within 0.5 mile of the intake facility. The entire 10-acre site (100%) has a high probability for containing prehistoric archeological resources.
Lane City Intake	Wharton	10	80	There are no recorded historic properties or cemeteries within the facility footprint or within 0.5 mile of the footprint. There are 6 potential historic resources within 0.5 mile of the intake facility. The entire 10-acre site (100%) has a high probability for containing prehistoric archeological resources.
Bay City Intake	Matagorda	10	100	There are 23 potential historic properties within 0.5 mile of the intake facility. The entire 10-acre site (100%)

Name	County	Acreage of HPA	Archeological HPA %	Results for Both Historic and Prehistoric Records Searches
				has a high probability for containing prehistoric archeological resources.
Wolfpen Intake	Colorado	15	Unknown	There are 6 potential historic resources within 0.5 mile of the intake facility. The 15-acre intake site has a high probability of containing prehistoric archeological resources.
Altair Intake	Colorado	15	100	There are no recorded historic properties or cemeteries within the facility footprint or within 0.5 mile of the footprint. Historic maps indicate there are no potential historic resources in the facility footprint, but there are 5 potential historic properties within 0.5 mile of the intake facility; 15 acres have a high probability of containing prehistoric archeological resources.

INTAKE PIPELINES

The intake pipelines consists of two 120-inch-diameter pipelines within a 200-foot construction easement that extends from the intake pumping station to the OCSF (see Figures 4 through 7). All subsequently proposed variations were encompassed within the originally reviewed pipeline footprints.

Table 3. Records Search Results for Intake Pipelines

Name	County	Acreage of HPA	Archeological HPA %	Results for Both Historic and Prehistoric Records Searches
IC	Colorado	53	35.4	There are 23 potential historic properties within 0.5 mile of the footprint. Approximately 53 acres, or 35.4% of the total footprint acreage, have a high probability for containing prehistoric archeological sites.
IC 1	Colorado	21	26.1	There are also no potentially historic properties within the footprint or within 0.5 mile of the footprint. There is also a low potential for prehistoric archeological resources, with 21 acres, or 26.1% of the total acreage that have a high probability of containing prehistoric archeological resources.

Name	County	Acreage of HPA	Archeological HPA %	Results for Both Historic and Prehistoric Records Searches
IC 2	Colorado	21	43.4	There are 4 potential resources within 0.5 mile of the footprint. Approximately 21 acres, or 43.4% of the total footprint acreage, have a high probability for containing prehistoric archeological resources.
IC 3	Colorado	22	21.1	Within 0.5 mile of the footprint, there are 3 recorded resources. Although historic maps indicate there are no potential historic properties within the footprint, there are 10 potential historic properties within 0.5 mile of the pipeline. Approximately 22 acres, or 21.1% of the total footprint acreage, have a high probability of containing prehistoric archeological resources.
IC 4	Colorado	16	20.5	Within 0.5 mile of the footprint, there are 3 recorded resources. Historic maps indicate that while there are no potentially historic resources located within the footprint, there are 19 potential historic resources within 0.5 mile of the pipeline footprint. There are 16 acres (20.5% of the total footprint acreage) that have a high probability of containing prehistoric archeological sites.
IC7A	Colorado	23		There is 1 potentially historic resource (irrigation ditch) within the pipeline footprint, and no potentially historic property within 0.5 mile of the footprint. Approximately 23 acres have a high probability for containing prehistoric archeological resources.
IC7D	Colorado	15		There are no recorded historic properties or cemeteries within the facility footprint or within 0.5 mile of the footprint. Historic maps indicate there are no potential historic resources in the facility footprint, but there are 5 potential historic properties within 0.5 mile of the intake facility; 15 acres have a high probability of containing prehistoric archeological resources
IW1	Wharton	32	30	There is 1 potentially historic building, structure, or object within the pipeline footprint, and 1 potentially historic building, structure, or object within 0.5 mile of the footprint. Approximately 32 acres, 30% of the total footprint acreage, have a high probability

Name	County	Acreage of HPA	Archeological HPA %	Results for Both Historic and Prehistoric Records Searches
				for containing prehistoric archeological resources.
IW 2	Wharton	80	44.9	There are 4 potentially historic properties within the pipeline footprint, and 25 potentially historic properties within 0.5 mile of the footprint. Approximately 80 acres, 44.9% of the total footprint acreage, have a high probability for containing prehistoric archeological resources.
IW 3	Wharton	48	11.3	There are 26 potential historic properties within the pipeline footprint. In addition, there are 91 potential historic resources within 0.5 mile of the footprint. The Pierce Ranch is 1 of these properties; its implications are discussed in detail in the Wharton 5 summary. About 48 acres of the pipeline footprint, or 11.3% of the total pipeline acreage, have a high probability of containing prehistoric archeological resources.
IW 4	Wharton	118	24.6	Within 0.5 mile of the footprint, there are 8 recorded resources. Historic maps indicate there are 10 potential historic properties located within the pipeline footprint and 102 potential historic properties located within 0.5 mile of the footprint. Approximately 118 acres, or 24.6% of the total pipeline acreage, have a high probability of containing prehistoric archeological resources.
IW 5	Wharton	9	10.2	There are no potential historic properties within the pipeline footprint or within 0.5 mile of that footprint. The prehistoric archeological potential is also low, with 9 acres, or 10.2% of the total acreage, having a high probability of containing prehistoric archeological sites.
IM	Matagorda	36	28.6	There are 19 potential historic properties located within the pipeline footprint and 44 potential historic properties located within 0.5 mile of the footprint. Approximately 36 acres, or 28.6% of the total pipeline acreage, have a high probability of containing prehistoric archeological sites.
IM 1	Matagorda	27	17.9	There are 4 potential historic properties located within the pipeline footprint and 32

Name	County	Acreage of HPA	Archeological HPA %	Results for Both Historic and Prehistoric Records Searches
				potential historic properties located within 0.5 mile of the footprint. Approximately 27 acres, or 17.9% of the total pipeline acreage, have a high probability of containing prehistoric archeological sites.
IM 2/ IM 2A	Matagorda	63	31.0	There is 1 recorded historic property (including cemeteries) within the facility footprint. Within 0.5 mile of the footprint, there are no recorded historic properties. According to historic U.S. Geological Survey (USGS) maps, there are 14 potential historic properties located within the pipeline footprint and 67 potential historic properties located within 0.5 mile of the footprint. Approximately 63 acres, or 31% of the total pipeline acreage, have a high probability of containing prehistoric archeological sites.
IM 3	Matagorda	11	39.3	There are 3 potential historic properties located within 0.5 mile of the footprint. Approximately 11 acres, or 39.3% of the total pipeline acreage, have a high probability of containing prehistoric archeological sites.

TRANSMISSION FACILITIES

In general, the transmission pump station, transmission pipeline and the terminal storage tank (as well as supporting ancillary facilities) are part of the Transmission Facilities (see Figures 4 through 7). All variations of these transmission facilities that are depicted in the report figures are within the footprint of those discussed below, or the footprint of one of the other three components.

Table 4. Records Search Results for Transmission Facilities

Name	County	Acreage of HPA	Archeological HPA %	Results for both Historic and Prehistoric Records Searches
TC	Colorado	159	47.9	There are 5 recorded historic properties. Historic maps indicate there are 5 potential historic properties located within the pipeline footprint and 65 potential historic properties located within 0.5 mile of the footprint. Approximately 159 acres, or 47.9% of the total pipeline acreage, have a high probability of containing prehistoric archeological sites.

Name	County	Acreage of HPA	Archeological HPA %	Results for both Historic and Prehistoric Records Searches
TC1	Colorado	35	43.1	There are no recorded historic properties or cemeteries within the facility footprint or within 0.5 mile of the footprint. In addition, historic USGS maps indicate there are no potential historic properties within the pipeline footprint or within 0.5 mile of that footprint. The prehistoric archeological potential is also low. Approximately 35 acres, or 43.1% of the total facility acreage, have a high potential for containing prehistoric archeological sites.
TC2	Colorado	4	54	There are no recorded or potential historic properties or cemeteries within the facility footprint or within 0.5 mile of the footprint. The prehistoric archeological potential is also low. Approximately 4 acres, or 54% of the total facility acreage, have a high potential for containing prehistoric archeological sites.
TC3	Colorado	11	5.4	There is 1 recorded historic property. According to historic USGS maps, there are no potential historic properties within the pipeline footprint or within 0.5 mile of that footprint. Approximately 11 acres, or 5.4% of the total facility acreage, have a high potential for containing prehistoric archeological sites.
TC4	Colorado	127	40.7	There are 2 recorded historic properties and 1 recorded cemetery within the facility footprint. There are an additional 8 historic properties recorded within 0.5 mile of this footprint. In addition, historic maps indicate that there are 33 potential historic properties within the footprint of the facility and 124 potential historic resources within 0.5 mile of this footprint. Approximately 127 acres, or 40.7% of the total facility acreage, have a high potential for containing prehistoric archeological sites.
TW	Wharton	72	27.6	There are 4 recorded historic properties. According to historic maps, there is 1 potential historic resource within the

Name	County	Acreage of HPA	Archeological HPA %	Results for both Historic and Prehistoric Records Searches
				footprint, and 26 potential resources within 0.5 mile of this footprint. Approximately 72 acres, or 27.6% of the total facility acreage, have a high potential for containing prehistoric archeological sites.
TW 2	Wharton	97	23.6	There are 15 potential historic properties within the footprint and 38 potential historic properties within 0.5 mile of that footprint. Approximately 97 acres, or 29.9% of the total facility acreage, have a high potential for containing prehistoric archeological sites.
TW 3	Wharton	49	23.6	There are 3 potential historic properties within the footprint and 23 potential historic properties within 0.5 mile of that footprint. Approximately 49 acres, or 23.6% of the total facility acreage, have a high potential for containing prehistoric archeological sites.
TW 4	Wharton	0	0	There are no recorded historic properties or cemeteries within the facility footprint or within 0.5 mile of the footprint. There are no potential historic properties within the footprint, and only 1 potential historic property within 0.5 mile of the footprint. There are also no high probability areas (0%) for prehistoric archeological resources.
TW 5	Wharton	56	19.8	There are 5 potential historic properties within the footprint and 34 potential historic properties within 0.5 mile of that footprint. Approximately 56 acres, or 19.8% of the total facility acreage, have a high potential for containing prehistoric archeological sites.
TM	Matagorda	101	27.7	Within 0.5 mile of the footprint, there is 1 recorded historic property. In addition, historic USGS maps indicate there are 10 potential historic properties located within the facility footprint and 160 potential historic properties located within 0.5 mile of this footprint. Approximately 101 acres, or 27.7% of the total facility acreage, have

Name	County	Acreage of HPA	Archeological HPA %	Results for both Historic and Prehistoric Records Searches
				a high potential for containing prehistoric archeological sites.
TM1	Matagorda	101	27.7	There are 4 potential historic properties located within the facility footprint and 28 potential historic properties located within 0.5 mile of this footprint. Approximately 56 acres, or 33.4% of the total facility acreage, have a high potential for containing prehistoric archeological sites.
TM2	Matagorda	16	58.9	There are no potential historic properties within the footprint, and 6 potential historic properties within 0.5 mile of the footprint. Approximately 16 acres, or 58.9% of the total facility acreage, have a high potential for containing prehistoric archeological sites.
TM3	Matagorda	31	16.1	There is 1 recorded historic property (including cemeteries) within the facility footprint. Within 0.5 mile of the footprint, there are no recorded historic properties. There are 13 potential historic properties within the facility footprint and 53 potential historic properties within 0.5 mile of the footprint. Approximately 31 acres, or 16.1% of the total facility acreage, have a high potential for containing prehistoric archeological sites.

IV. CONCLUSIONS

Atkins conducted a reconnaissance-level cultural resources survey and constraints analysis on behalf of the LCRA and SAWS. The purpose of this study was to assist LCRA and SAWS in their compliance with the Antiquities Code of Texas and Section 106 of the NHPA. The LSWP was a partnership aimed at developing a plan to provide a reliable water supply to San Antonio for 40 years, with an option for 30 additional years, and to provide a more reliable long-term water supply for the lower Colorado River basin. The records review identified potential cultural resources constraints that may have been encountered by the proposed project in Colorado, Wharton, and Matagorda Counties. The goal of the constraints analysis was to determine if any of the potential site positions have been previously surveyed, to verify the results of the records review, and to identify any additional resources observed in the field. Atkins obtained Antiquities Permit No. 3797 in compliance with the Antiquities Code of Texas to conduct an intensive survey; however, the project was canceled before the field work was executed. The entire project area will need to be surveyed archeologically should the project resume in the future.