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Geronimo Creek Outfall Replacement, The City of Seguin, Guadalupe County, Texas: An Intensive Cultural Resource Survey

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By:

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TRC Technical Report No. 202304

Prepared for:

Prepared by:

August 2015

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August 2015

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EXECUTIVE SUMMARY

The City of Seguin (City) is proposing to construct a new, replacement effluent outfall for the Geronimo Creek Wastewater Treatment Plant. The City also proposes to abandon the existing outfall structure and existing pipeline in place. The proposed project will involve the extension of an existing 24 inch (in) (61 centimeters [cm]) wastewater treatment plant effluent line for a length of 535 feet (ft.) (163 meters [m]). The line will terminate at a new outfall structure located on the east bank of Geronimo Creek, approximately 260 ft. (79 m) from its confluence with the Guadalupe River. Two new manholes will be constructed along the line at major bends in the line. Line depths will range from 9 to 28 ft. (2.7 to 8.5 m). A 40 ft. (12.2 m) wide permanent easement is proposed for the line, along with a 30 ft. (9.1 m) wide temporary easement for construction purposes. The extent of the outfall structure should be fully within the 40 ft. (12.2 m) wide easement. The area of potential effect (APE) is defined as an area measuring 535 ft. (163 m) in length, and 70 ft. (21.3 m) in width for a total of 0.85 acres, and generally follows the eastern bank of Geronimo Creek.

The Texas Historical Commission (THC) reviewed the proposed development plans and determined that a cultural resource survey was necessary for this City proposed project as the area has potential for cultural resources. The City contracted with TRC Environmental Corporation (TRC) of Austin to conduct the intensive cultural resource survey of their proposed undertaking/APE.

TRC archeologists consulted the THC Archeological Sites Atlas (THC Atlas), a database that contains previously documented cultural resource sites and locations of previously conducted archeological surveys, prior to the field investigations. A 1 mi. (1.6 km) radius search around the APE revealed one previously recorded cultural resource site, 41GU21. This prehistoric site is on a high terrace just west of Geronimo Creek and has been extensively disturbed during modern housing construction and is considered ineligible for inclusion in the National Register of Historic Places (NRHP). No previous cultural resources surveys have been conducted in the vicinity of the APE. Southwest of the APE and beyond the 1 mi. (1.6 km) radius was a Texas Department of Transportation survey conducted in 2007 by Moore Consulting, Inc. along Farm-to-Market road 477. No cultural resources were recorded in that linear investigation.

On October 14 and 15, 2014, Mike Quigg, a TRC archeologists of the Planning, Permitting, and Licensing Practice of TRC's office in Austin, conducted an intensive cultural resource survey along the 535 ft. (163 m) length of proposed APE. This included a 100 percent pedestrian survey, plus the mechanical excavation of four backhoe trenches (BT) within the APE to determine the presence/absence of any potential cultural resources within the APE. One deeply buried prehistoric site of potential significance was identified in two trenches (BTs 1 and 2) on the upper terrace along the APE. No cultural materials were recovered from two trenches (BTs 3 and 4) dug into the APE in the lower terrace. No historic structures were in the proposed APE.

TRC recommends avoidance of the potentially significant, deep stratified prehistoric site. If the site cannot be avoided then TRC recommends further testing to assess the sites significance, and the potential to yield significant information important in prehistory, either locally, regionally or nationally as per its legal obligations under existing state guidelines.

The City of Seguin reviewed the draft report, the archeological findings, and recommendations by TRC archeologists, and sought an alternate route for the proposed sewer line to avoid impact to cultural resource site 41GU168. The City and its engineers agreed to an alternate reroute satisfactory with the landowner that avoids the upper terrace and the archeological site altogether. This proposed reroute successfully avoids and preserves deeply buried prehistoric site 41GU168 in place. TRC now recommends no further cultural resource investigation following the new proposed sewer line location.

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ACKNOWLEDGEMENTS

No cultural resources management project is completed without the efforts of multiple individuals who are usually hidden in the shadows. Benjamin Bury conducted many of the background studies and the THC Atlas file searches. Craig Bell of TRC Civil Engineering Services coordinated with City personnel for this project and the use of the City backhoe services and was key in working with the City on engineering proposed reroutes to avoid the archeological site. Rod Ramirez of the City facilitated the use of the backhoe. In the field, the backhoe was skillfully operated by Nakeea Attaway. Mr. Gary Rainwater, current landowner of the property, graciously permitted access to the property and allowed the excavations of the multiple backhoe trenches. Chad Rainwater stopped by a number of times and passed along useful information and showed interest in our work.

Nick Hall produced the high quality Figures 1-2, and 1-3 showing the outfall structure locations. Other figures were expertly produced by Shannon Gray, who also conducted a number of background searches for historic information. Kimberly Culp, of TRC Civil Engineering Services also commented on a draft of this report. Jodi Jacobson and Ashleigh Knapp edited and proofed this report. TRC biologist Todd Schnakenberg is thanked for allowing his photographs to be used in this report. Ashleigh formatted the draft and final report and helped in the distribution of the final report to 12 selected libraries. The printing was conducted by Document Engine of Round Rock. Thanks to all for their contributions no matter how large or small as it takes many to complete the process.

Mike Quigg
Project Archeologist

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1.0 INTRODUCTION

1.1 INTRODUCTION

The City of Seguin (City) is proposing to construct a new, replacement effluent outfall for the Geronimo Creek Wastewater Treatment Plant (Figures 1-1, 1-2 and 1-3). They also propose to abandon the existing outfall structure and existing pipeline in place. The proposed project will involve the extension of an existing 24 inch (in) (61 centimeters [cm]) wastewater treatment plant effluent line for a length of 535 feet (ft.) (163 meters [m]). The line will terminate at a new outfall structure located on the east bank of Geronimo Creek, approximately 260 ft. (79 m) from its confluence with the Guadalupe River. Two new manholes will be constructed along the line at major bends in the line. Line depths will range from 9 to 28 ft. (2.7 to 8.5 m). A 40 ft. (12.2 m) wide permanent easement is proposed for the line, along with a 30 ft. (9.1 m) wide temporary easement for construction purposes. The extent of the outfall structure should be fully within the 40 ft. (12.2 m) wide easement. The area of potential effect (APE) is defined as an area measuring 535 ft. (163 m) in length, and 70 ft. (21.3 m) in width for a total of 0.85 acres, and roughly follows the eastern bank of Geronimo Creek with the outfall into the creek.

This City proposed undertaking represents a publically sponsored project on privately owned land with the potential to impact deeply buried cultural resources that may exist within the APE. Therefore, the City was required by the Texas Historic Commission (THC) to conduct an intensive cultural resource survey to meet its legal obligations under existing state guidelines that include the Antiquity Code of Texas 1977 (revised 1987), Title 9, Chapter 191, VACS, Art. 6145-9. Other Federal guidelines that support cultural resource legislation in Texas include: Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966 (P.L. 89-665; 80 Stat. 915; 16 USC §470 et seq.); the National Environmental Policy Act (NEPA) of 1969 (P.L. 91-190; 83 Stat. 852; 42 USC §4221 et seq.); Executive Order No. 11593 of 1971, "Protection and Enhancement of the Cultural Environment"; the Archaeological and Historic Preservation Act (AHPA) of 1974 (P.L. 93-291; 88 Stat. 174; 16 USC §469 et seq.); the American Indian Religious Freedom Act (AIRFA) of 1978 (P.L. 95-341; 92 Stat. 469; 42 USC §12996); the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (P.L. 101-601; 104 Stat. 3048; 25 USC §3001 et seq.).

Following a review of the proposed undertaking by the THC, the THC recommended a cultural resource survey. To meet its responsibilities under existing State and Federal statutes, the City contracted TRC Environmental Corporation (TRC) of Austin to conduct the necessary cultural resource survey and biological assessment. Subsequently, TRC archeologists submitted a Texas Antiquities Permit Application with a scope of work to the THC, and Antiquities Permit #7007 was issued to archeologist J. Michael Quigg to oversee the necessary cultural resource investigations.

On October 14 and 15, 2014 Mr. Quigg, Project Archeologists of the Planning, Permitting, and Licensing Practice of TRC's office in Austin, conducted an intensive Phase I cultural resource survey along the 535 ft. (163 m) long proposed APE. The survey consisted of 100 percent pedestrian survey, plus mechanical excavation of four backhoe trenches (BTs 1 through 4) within the

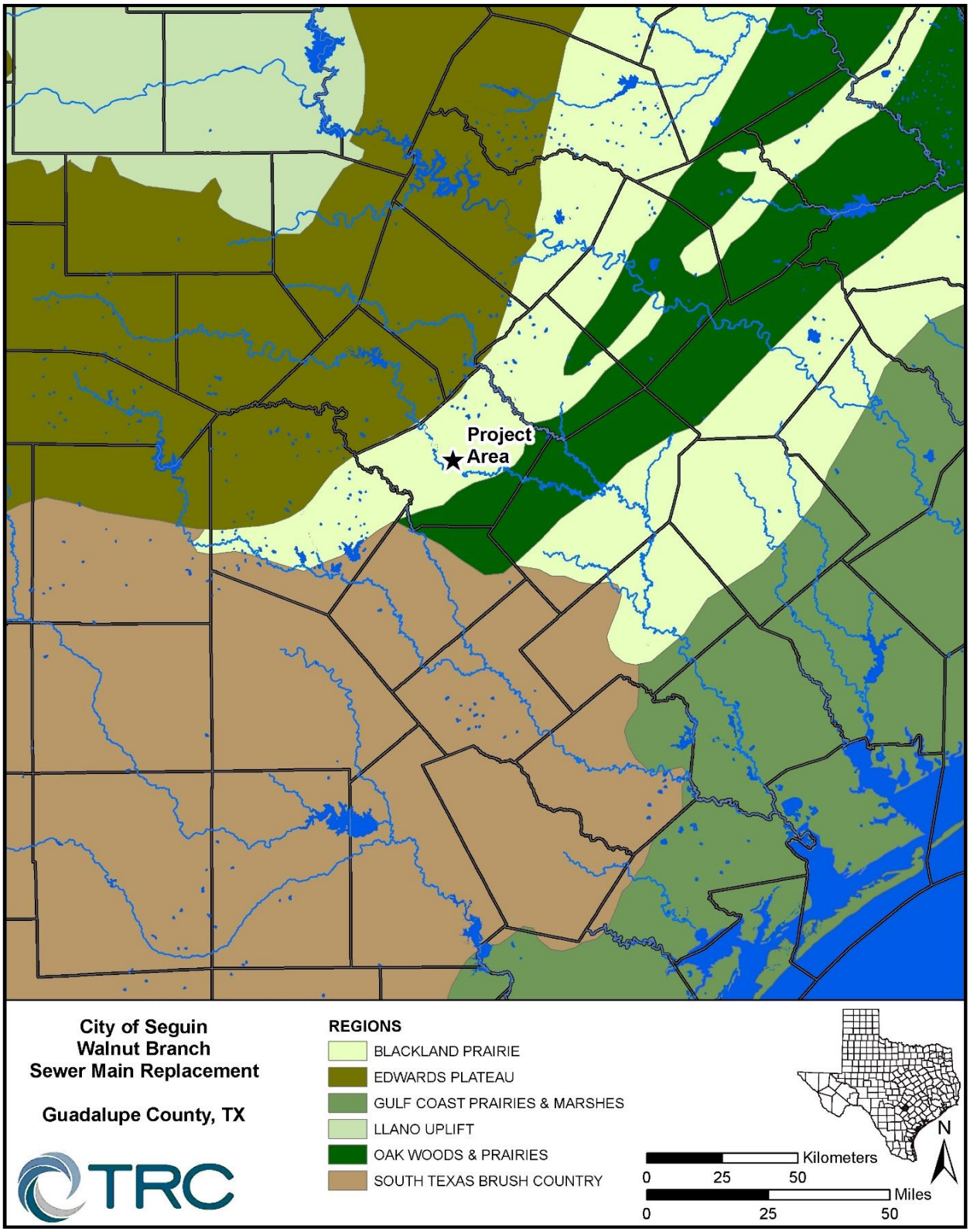

Figure 1-1. General project location shown on regional biotic zones.

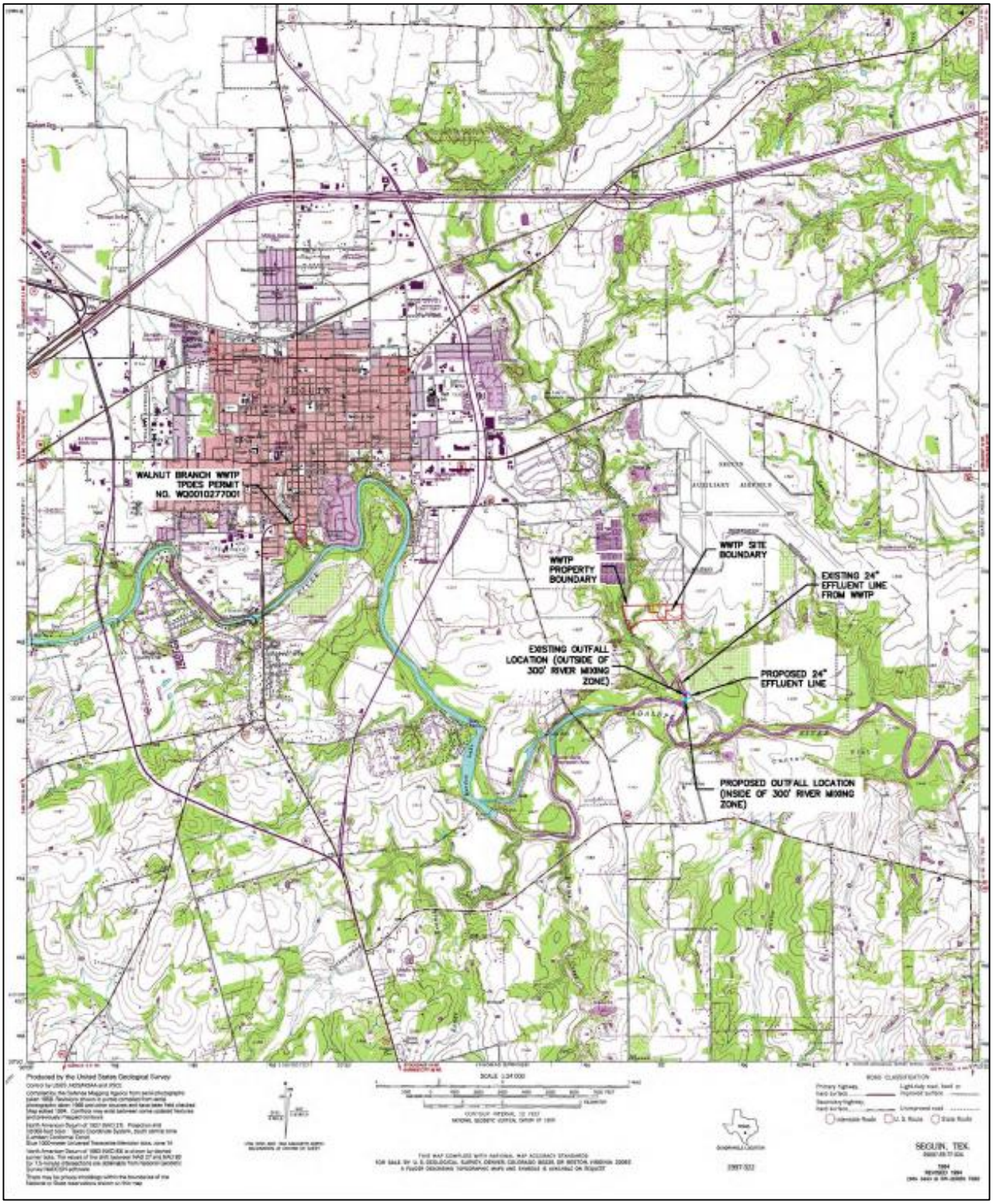

Figure 1-2. General project location shown on Texas on U.S. Geological Seguin 7.5 minute series quadrangle map [2997-322].

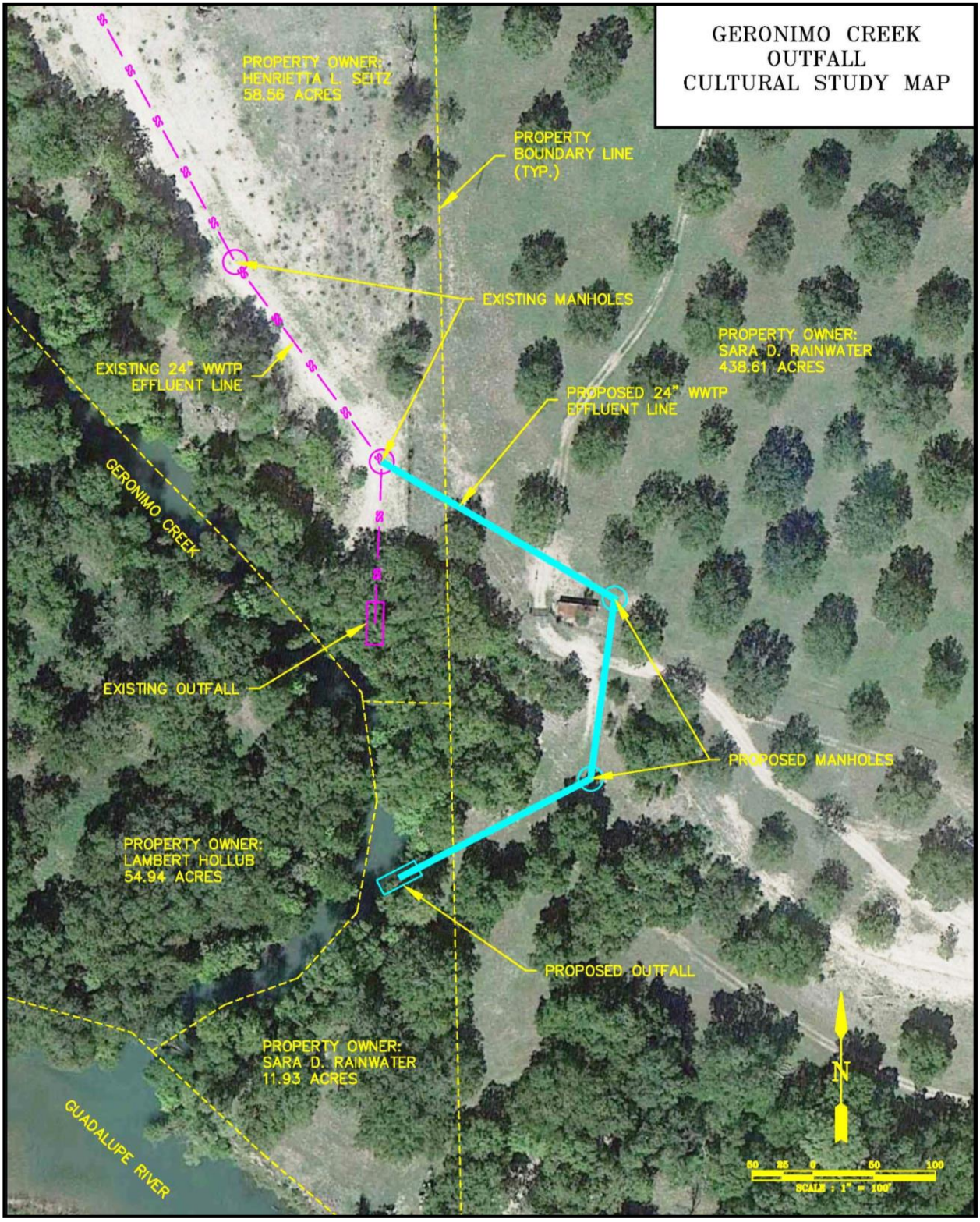

Figure 1-3. Aerial photograph depicting location of proposed new pipeline and outfall structure near the confluence of Geronimo Creek and Guadalupe River southeast of Seguin, Texas.

APE to determine the presence/absence of any potential cultural resources within the APE. One deeply buried prehistoric site (41GU168) of potential significance was identified in BTs 1 and 2 buried in the upper terrace (T_3) in the APE. No significant historic structures were in the proposed APE. TRC recommends avoidance of buried prehistoric site 41GU168, and if it cannot be avoided then TRC recommends further testing to assess the significance of this site as per the State and Federal laws.

1.2 PROJECT LOCATION, DESCRIPTION, AND DISTURBNACES

The City proposes to install a new 24 in. (61 cm) pipeline for treated effluent that would connect to an existing 24 in. (61 cm) pipeline from the City's waste water treatment plant along the eastern margin of San Geronimo Creek (see Figure 1-3). The City is proposing to abandon the existing concrete outfall structure (Figure 1-4) and the existing pipeline in place and to construct a new outfall structure that empties into Geronimo Creek approximately 275 ft. (84 m) downstream of the existing outfall. A new concrete outfall structure will be constructed along the eastern bank of Geronimo Creek (Figures 1-5 and 1-6). The depth of excavation for the new outfall structure will range between 8 and 12 ft. (2.4 to 3.7 m) in the proposed location on the bank of Geronimo Creek. A concrete walkway with stairs will be provided at the edge of Geronimo Creek for maintenance purposes. The total area of creek bed and bank to be impacted during construction will be approximately 100-by-100 ft. (30.5 m) to install concrete footings for the outfall and walkway structures. Water bladder cofferdams will be placed in the river to isolate the work area. Water will be pumped out of the area using pumps with screens to ensure aquatic organisms will not be sucked up. Construction is planned for fall 2014. The new pipeline will be installed in an undeveloped upland area just east of the creek (Figure 1-7).

1.3 CONTENTS OF REPORT

Following this introductory chapter, Chapter 2.0 presents an overview of the modern environmental setting for the Guadalupe County region. Chapter 3.0 provides a brief synthesis of the regional prehistory of central Texas. Chapter 4.0 presents the archeological site file search conducted electronically at the THC Archeological Sites Atlas (THC Atlas) and other historical document repositories. Chapter 5.0 describes the research objectives and the methods employed to investigate the APE. Chapter 6.0 presents the intensive archeological survey results. Chapter 7.0 summarizes the findings and makes recommendations to the THC concerning further work. Chapter 8.0 includes references cited within the document.

Figure 1-4. Existing outfall structure on eastern edge of Geronimo Creek that will be abandoned in place (photograph by Todd Schnakenberg).

Figure 1-5. General location of proposed new outfall structure, creek side, view south (photograph by Todd Schnakenberg).

Figure 1-6. Terrace 1 (T_1) surface depicting general location of proposed new outfall structure above Geronimo Creek (left), view north (photograph by Todd Schnakenberg). Note landowner picnic area in background.

Figure 1-7. General location of proposed new pipeline across undeveloped upper terrace (T_3) east of Geronimo Creek, view north (photograph by Todd Schnakenberg). Note the existing sewer line is on northern side of vegetated fence towards left side of picture.

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2.0 ENVIRONMENTAL SETTING

J. Michael Quigg

2.1 PHYSIOGRAPHY AND MODERN SETTING

The City of Seguin lies some 15 mi. (24 km) east of the Balcones Escarpment in the Blackland Prairie (see Figure 1-1). The escarpment is formed from a fault system and creates a sharp visual and topographical break in the landscape. The APE is in the narrow southern end of the Blackland Prairie, a relatively flat ecological region that generally parallels the Balcones escarpment and extends from central Texas northward to the Red River. This zone was originally characterized by grasslands with scattered trees. A short distance further east is the Inner Gulf Coastal Plain that stretches to the Gulf of Mexico. Geronimo Creek is a short intermittent tributary that flows southward from about 7 mi. (11.3 km) north of Seguin and empties into the southeasterly flowing Guadalupe River just south of the City (Figure 2-1). The Guadalupe River originates in the Edwards Plateau to the northeast and flows southeastward across the Blackland Prairie and joins the San Marcos River farther east and eventually flows into the Gulf of Mexico.

Historically, the land use across much of the Blackland Prairie was dominated by intensive cultivation. This followed land clearing activities that undoubtedly removed much of the woodlands along and throughout the Blackland Prairies. Currently, riparian woodlands exist primarily along the margins of the Geronimo Creek and the Guadalupe River and other watered environments outside developed areas.

2.2 CLIMATE

The region is classified as humid, subtropical and is influenced mostly by tropical Maritime air masses from the Gulf of Mexico for most of the year (Ramsey and Blade 1977). Summers are hot. Winters are mild interrupted by the occasional

Figure 2-1. General view of Guadalupe River south of confluence with Geronimo Creek, view southeast (photograph by Todd Schnakenberg).

polar air masses that drop the temperatures for short periods of time. Mean monthly maximum temperature vary from 81 to 102 °F (27.2 to 38.9 °C), whereas mean monthly minimum temperatures vary from 21 to 67°F (-6.1 to 19.4°C) (Figure 2-2). July and August are the hot and dry months with temperatures generally greater than 90°F (Figure 2-2). Annual precipitation is about 30 in. (76 cm) with most rainfall in late spring and early fall in the form of thunderstorms (Figure 2-3). Yearly averages vary considerably with 1949 being the wettest with 49.5 in. (125.7 cm), whereas 1925 provided the driest with only 15 in. (38 cm). Prevailing winds are southeasterly during March through September but shift northerly from October through February (Ramsey and Blade 1977).

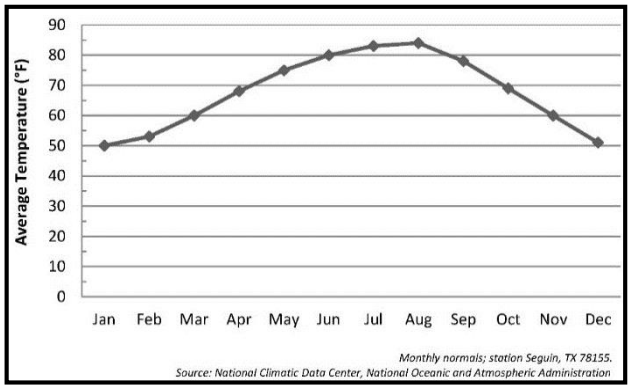

Figure 2-2. Average temperature by month for Seguin in Guadalupe County, Texas.

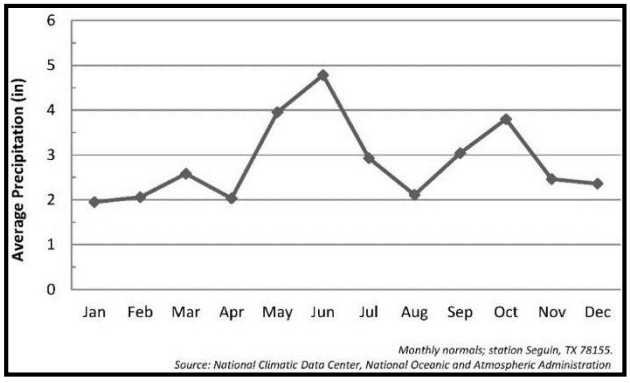

Figure 2-3. Average monthly precipitation for Seguin in Guadalupe County, Texas.

2.3 GEOLOGY

The APE is situated within Holocene alluvium (Qal) (Barnes 1979; Bureau of Economic Geology 1954 [revised 1965]: Geologic Atlas of Texas, Seguin Sheet; Scale 1:250,000) (Figure 2-4). Immediately bordering the alluvium is Leona Formation (Qt), which is Pleistocene or older is age. This is fine grained calcareous silt grading down into sand and into coarse gravels.

2.4 SOILS

Soils in the APE include Bosque and Seguin soils, frequently flooded (Bo) (Figure 2-5). The Bosque series consists of deep, nearly level, well-drained, moderately permeable soils that formed in stratified loamy alluvial sediment. In profile, Bosque soils contain up to 62 in. (157.5 cm) of loam. The Seguin (Se) series consists of deep, nearly level, well-drained, moderately permeable soils on bottomlands that formed in loamy alluvium. Seguin soils contain up to 62 in. (157.5 cm) of silty clay loam. The parent material consists of clayey alluvium of Holocene age derived from mixed sources. The Bosque and Seguin soils are subject to flooding at least once per year. Given their characteristics, and the underlying geology, these soils have high potential to contain deeply buried cultural materials is well-stratified deposits.

2.5 FLORA

Tharp (1939) designates this area as an extension of the bluestem grasses-(*Andropogon* spp.)-needle grasses-(*Stipa* spp.)-triple-awn grasses (*Aristida* spp.) association of the Tall Grass Prairie. Presently, the bottomlands (floodplains) have been significantly altered from their original state and are comprised of ground-cover regrowth understory (Kenmotsu 1982). These areas are now dominated by introduced species such as brome grasses, rescuegrass (*Bromus unioloides*) and Japanese brome (*Bromus japonicas*). Canadian wildrye (*Elymus canadensis*) and Johnson grass (*Sorghum halepense*) are found in shaded areas by

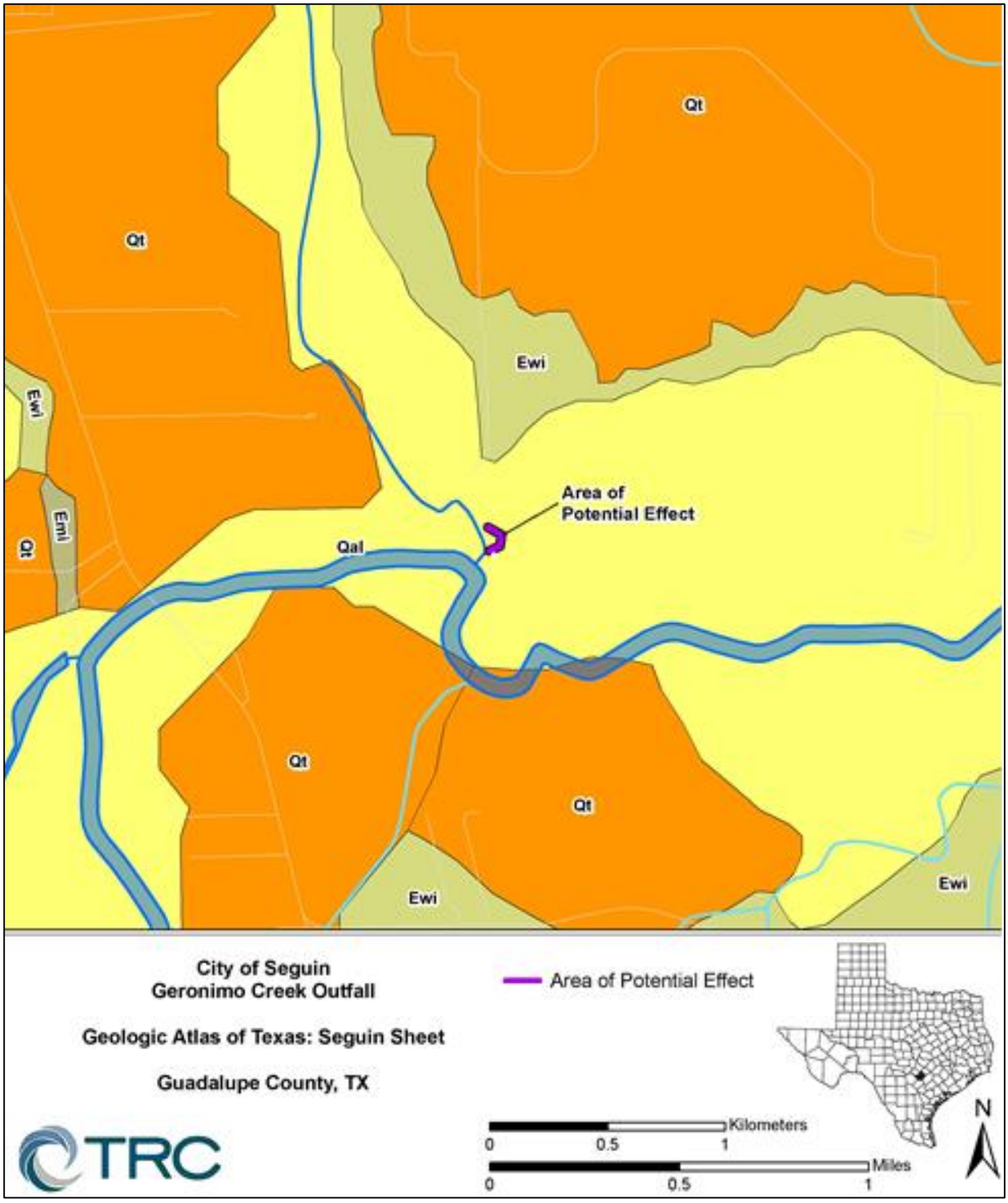

Figure 2-4. Geology map depicting recent Holocene alluvium (Qal, light yellow) in and surrounding the project area of petentiaol effect on Seguin topographic Sheet 1954 (revised 1965).

Figure 2-5. Aerial photograph depicting mapped soil units in the area of potential effect immediately east of Geronimo Creek south of Seguin, Texas.

Figure 2-6. Photograph depicting riparian vegetation along Geronimo Creek (photograph by Todd Schnakenberg).

midsummer, along with scattered populations of Texas Wintergrass (*Stipa leucotricha*). The overstory includes: netleaf hackberry (*Celtis reticulate*), cedar elm (*Ulmus crassifolia*), pecan (*Carya* sp.), red ash (*Fraxinus pensylvanica*), red mulberry (*Morus rubra*), eastern cottonwood (*Populus deltoids*), prickly ash (*Xanthoxylum clava-herculis*), deciduous holly (*Ilex decidua*), black willow (*Salix nigra*), osage orange (*Maclura pomifera*), box elder (*Acer negundo*), soapberry (*Sapindus saponaria*), and chinaberry (*Melia azearach*) (Kenmotsu 1982:3-15).

The upland prairie assemblages also reflect disturbed conditions with Johnson grass (*Sorghum halepense*), Roosevelt weed (*Baccharis neglecta*), hedge parsley (*Torilis arvensis*), yellow sweet clover (*Melilotus officinalis*), and silverleaf nightshade (*Solanum elaeagnifolium*). Other major species in the area include prairie three-awn (*Aristida oligantha*) and little bluestem (*Schizachyrium scoparium*) (Kenmotsu 1982).

Specifically in and surrounding the APE, the upland vegetation consists of various tree, scrub-shrub, and herbaceous communities located within areas along the proposed sewer main corridor adjacent to Geronimo Creek. Upland tree and scrub-shrub plants observed in and the immediate area of the APE include; American elm (*Ulmus americana*), pecan (*Carya illinoinensis*), mesquite (*Prosopis glandulosa*), and common hackberry. Herbaceous plants observed in the upland areas include straggler daisy (*Calyptocarpus vialis*), Bermudagrass (*Cynodon dactylon*), silverleaf nightshade (*Solanum elaeagnifolium*), upright prairie coneflower (*Ratibida columnifera*), and Virginia creeper (*Parthenocissus quinquefolia*) (Schnakenberg 2014).

A distinct riparian vegetation community is along Geronimo Creek in the vicinity of the proposed outfall location (Figure 2-6). Tree and scrub-scrub plant species observed within the riparian zone included American sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), common hackberry (*Celtis occidentalis*), and yaupon (*Ilex vomitoria*). Herbaceous plant species observed within the riparian zone include elephant's ear (*Xanthosoma sagittifolium*), giant ragweed (*Ambrosia trifida*), Virginia creeper (*Parthenocissus quinquefolia*), Indian woodoats (*Chasmanthium latifolium*), mustang grape (*Vitis mustangensis*), and eastern poison ivy (*Toxicodendron radicans*) (Schnakenberg 2014).

Although most discussions of the Blackland Prairie do not provide potential plant food resources, botanists such as Dering (2000) have offered up a number of potential geophyte resources in the Blackland Prairie region that might have been utilized by prehistoric populations. These include bulbs of eastern camas (*Camassia scilloidies*), wild onion and garlic (*Allium* spp.), false garlic (*Nothoscordum bivalve*), rain lily (*Cooperia drummondii*), dog's tooth violet (*Erythronium albidum*), yellow-eyed grass (*Hypoxis hirsute*) along with tubers such as prairie turnips (*Psoralea* spp.), groundnut (*Apios americana*), and spring beauty (*Claytonia virginica*) (Dering 2000:219).

Gould (1975) lists a number of forbs found in the Blackland Prairie. These include, but are not limited to, bluebonnet (*Lupinus texensis*), Mexican hat (*Ratibida columnaris*), sunflower (*Helicanthus annuus*), Indian paintbrush (*Catilleja indivisa*), western ragweed (*Ambrosia psilostachya*), and milkweed (*Asclepias* spp.).

2.6 FAUNA

As part of the Texan biotic province, Blair (1950:101) lists at least 49 species of mammals present in this province. Most species are not restricted to this one province. Common species of mammals include: Virginia opossums (*Didelphis virginiana*), eastern mole (*Scalopus aquaticus*), fox squirrel (*Sciurus niger*), Louisiana pocket gopher (*Geomys breicepus*), western harvest mice

(*Reitbrodontomys fulvescens*), White-footed mice (*Peromyscus leucopus*), hispid cotton rat (*Sigmodon hispidus*), eastern cottontail (*Sylvilagus floridanus*), and swamp rabbit (*Sylvilagus aquaticus*). Two species of turtles, ornate box turtle (*Terrapene ornata*) and Florida box turtles (*Terrapene Carolina*), occur here. Sixteen species of lizards and some 39 species of snakes occur in this province.

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Fauna typically associated with Texas-at-large (Blair 1950; Schmidly 1994) and found within the region of interest include white-tailed deer (*Odocoileus virginianus*), jackrabbit (*Lepus* sp.), raccoon (*Procyon lotor*), armadillo (*Dasypus novemcinctus*), northern river otter (*Lontra canadensis*), and coyote (*Canis latrans*).

3.0 CULTURAL BACKGROUND

J. Michael Quigg

3.1 INTRODUCTION

Archeologists in Texas have assigned cultural regions to portions of Texas that generally correspond to various physiographic characteristics of the areas (Figure 3-1). The indigenous human inhabitants of central Texas practiced a nomadic hunting and gathering lifestyle throughout all of prehistory and, in contrast to much of the rest of North America, mobility and settlement patterns do not appear to have changed markedly through time in this region. The central Texas chronological scheme is presented below, and much of this summary is extracted from Collins (1995, 2004). The archeological manifestations of central Texas are divided into four broad time periods: the Paleoindian, Archaic, Late Prehistoric, and Protohistoric/Historic periods (Figure 3-2). A brief synthesis of the key characteristics of these four periods is presented below.

Human occupations in North America are definitely established by at least 12,000 B.P. (Bement and Carter 2010; Collins 2004; Dincauze 1984; Haynes et al. 1984; Kelly and Todd 1988; Lynch 1990; Meltzer 1989; Stanford and Bradley 2012). Considerable evidence is mounting for per 12,000 B.P. human occupations (pre-Clovis populations) across North and South America (Stanford and Bradley 2012). Evidence from Meadowcroft Rockshelter in Pennsylvania indicates humans were present in Eastern North America as early as 14,000 to 16,000 years ago (Adovasio et al. 1990), and Cactus Hill in southeastern Virginia contains unmixed stratigraphic deposits from ca. 22,000 B.P. (McAvoy and McAvoy 1997), where discoveries at Monte Verde in Chile provide unequivocal evidence for human occupation in South America by at least 12,500 years ago (Dillehay 1989, 1997, 2000; Meltzer et al. 1997). Many archeologists still discount claims of much earlier human occupation during the Pleistocene glacial period (cf. Butzer 1988). In central Texas, the Levi Rockshelter contains human artifacts that potentially date to the pre-Clovis period (Alexander 1963, 1982). However, poor stratigraphy and inconsistent radiocarbon dates do not clearly reveal those artifacts in good context. More recent discoveries at the Gault site in central Texas have

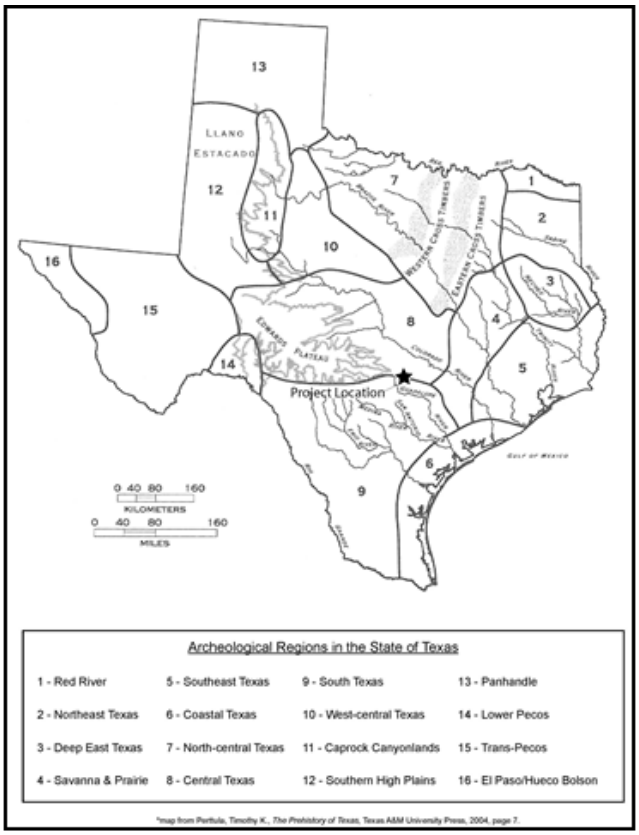

Figure 3-1. Map of the cultural regions across Texas (from Perttula 2004). Paleoindian Period (11, 500 to 8800 B.P.).

yielded pre-Clovis artifacts in good context below the Clovis component (Collins personal communications 2014; Stanford and Bradley 2012). Although the evidence for pre-Clovis maybe sparse in general and not accepted by all researchers at present, never the less compelling evidence exists and growing more abundant for pre-Clovis cultures North and South America.

The well-defined and most accepted period of human activities in central Texas is represented by the Paleoindian period (11,500 to 8800 B.P. [Bousman et al. 2004; Collins 1995]). This period coincided with improved climatic conditions following the close of the Pleistocene epoch that witnessed the extinction of herds of mammoth, horse, camel, and bison. Cultures representing various sub-periods within this period are characterized by series of distinctive, relatively large, fluted lanceolate projectile points known as Clovis and a distinctive knapping technology (Collins 1999; Collins and Lohse 2004; Collins et al. 2007). Clovis hunters killed now extinct ice age animals (i.e., horse, camel, and mammoth) that ranged across most of North America (see Stanford and Bradley 2012 for recent update; Texas Beyond History 2008). However, locally Clovis sites have yielded a more diverse meat resource that included land turtles, fish, small mammals, birds along with bison (Collins 2002).

Figure 3-2. Central Texas cultural chronology after Collins (1995, 2004).

Following Clovis is another fluted point type referred to as Folsom and those populations were highly mobile hunters that primarily targeted large extinct bison (i.e., *Bison antiquus* or *Bison occidentalis*) (Bement 1999; Hofman 1992; Hofman et al. 1991; Jodry and Stanford 1992). Folsom sites are generally dated to between 10,900 to 10,200 B.P. (Haynes et al. 1992). These and other lanceolate projectiles including named types such as Plainview, San Patrice, Dalton, Golondrina, and other general categories including contracting stem forms like Angostura and Midland, parallel stem points like St. Mary's Hall and Scottsbluff, stemmed forms like Wilson and side-notched Big Sandy are frequently associated with spurred end scrapers, gravers, and a suit of informal tools.

For the latest discussion and updates of the named types and clustering of point types the reader is referred to Bousman et al. (2004). Bousman et al. (2004) also provide a complete examination of the absolute chronology for the Paleoindian period and the stratigraphic association of some of the important Texas sites. Currently, some 32 sites have been radiocarbon dated and some 243 dates are now available to facilitate the assignment of the various Paleoindian populations.

In central Texas, the Paleoindian period is divided into two sub-periods based on recognizable differences in projectile point styles. The Early Paleoindian period is recognized by fluted projectile points (i.e., Clovis and Folsom). In Texas

most Clovis points, over 400 specimens, occur in surface scatters with archeological materials from later periods. Clovis points have been collected from across the state in 50 percent of the counties (Meltzer and Bever 1995). Clovis distribution is not coincident with the distribution of later Paleoindian remains. Actual Clovis sites in Texas are rare with a few exceptions such as the Gault site (Collins et al. 2011) and Pavo Real (Collins et al. 2003). The material used in manufacture of Clovis specimens is primarily Edwards Chert (Meltzer and Bever 1995). The Late Paleoindian period is characterized by unfluted lanceolate points (i.e., Wilson, Golondrina-Barber, and St. Mary's Hall). Components with these types of points date between 10,000 and 8800 B.P. However, the Plainview points along with Dalton and San Patrice-like points require further documentation to specifically place them in time in Texas.

Paleoindian groups are often inferred to have been organized into egalitarian bands consisting of a few dozen individuals that practiced a fully nomadic subsistence and settlement pattern. Due to poor preservation of floral materials, subsistence patterns in central Texas are known primarily through the study of faunal remains. Subsistence focused on the exploitation of plants, large and small animals, fish, and shellfish, even during the Paleoindian period (Collins et al. 1989). Little evidence exists in this region for hunting of extinct mega fauna (the exception being at Wilson-Leonard in Bell County for the early sub-period), as has been documented elsewhere in North America. Rather, a broad-based subsistence pattern appears to have been practiced throughout most periods. The Folsom population appears to have focused on bison hunting in other areas but also included broad range of other taxa. Important here is the association of burned rock features with these Folsom points at Wilson-Leonard site (Collins 1998).

3.2 ARCHAIC PERIOD (8800 TO 1200 B.P.)

The onset of the Holocene Climate Optimum drying trend marks the beginning of the Archaic period (8000 to 1200 B.P.). This climatic trend represents a significant reorientation of lifestyle throughout most of North America, but this change was far less pronounced in central Texas. Elsewhere, the changing climatic conditions and corresponding decrease in the big game populations forced people to rely more heavily upon a diversified resource base composed of smaller game and wild plants. In central Texas, however, this hunting and gathering pattern is characteristic of most of prehistory. This period saw the intensification of hunting and gathering of local resources. With this came a more diversified tool kit, the development of an expanded ground stone assemblage, and an extensive use of heated rocks and are hallmarks of this period (Collins 1995). The use of the atlatl (i.e., spear thrower) and spear were the primary hunting instruments.

Traditionally, the long Archaic period is subdivided into Early, Middle, and Late sub-periods based on changes in projectile points and other distinctive changes. In central Texas, the Early Archaic sub-period extends from 8800 to 6000 B.P., the Middle Archaic sub-period extends from 6000 to 4000 B.P., and the Late Archaic sub-period covers the 4000 to 1200 B.P. (Collins 1995). Changes in projectile point morphology are often used as markers differentiating these three sub-periods, though other changes in material culture occurred as well (Quigg et al 2011). Perhaps most markedly, burned rock middens appear during the Middle Archaic sub-period, continuing into and through the Late Archaic sub-period. Large cemeteries also appear during the Late Archaic sub-period and mark some type of social changes. In addition, the increasing density of prehistoric sites through time is often considered to constitute evidence of

population growth, though differential preservation probably at least partially accounts for the lower numbers of older sites.

3.3 LATE PREHISTORIC PERIOD (1200 TO 400 B.P.)

The onset of the Late Prehistoric period is defined by the appearance of the bow and arrow (Collins 1995). In central Texas, pottery also appears during the Late Prehistoric period (later than the bow and arrow and appearing earlier in east Texas by about 2500 B.P.). Agriculture came even later and only to some parts of Texas, mostly in the northeastern and northwestern parts. In Texas, unifacial arrow points appear to be associated with a small prismatic blade technology (Ricklis 1994). In central Texas, two subdivisions are recognized, the Austin and Toyah phases. Austin phase sites occur earliest to the north, which has led some researchers (e.g., Prewitt 1985) to suggest that the Austin phase populations of central Texas were migrants from the north and lacked the ceramic industry of the later Toyah phase. The Austin phase continued with an Archaic subsistence pattern but the bow and arrow were definitely in use at this time. The Toyah phase replaces the Austin phase. A cluster of traits including small-stemmed arrow points, pottery, large thin bifaces, and prismatic blades characterizes the Toyah phase. These latter groups subsisted on diverse resources including bison, deer, antelope, mussels and other wild game.

One of the primary indicators of Late Prehistoric period peoples is the introduction and use of pottery. Bone (Leon Plain) and shell-tempered specimens are prevalent in occupations throughout central Texas in this period. The increased use of pottery suggest a more sedentary existence that involves less frequent travel and focus on more intensive subsistence activities, such as horticulture.

3.4 PROTOHISTORIC PERIOD (500 TO 200 B.P.) AND HISTORIC PERIOD (200 TO 50 B.P.)

The first European incursion into what is now known as Texas was in A.D. 1519, when Álvarez de Pineda explored the northern shores of the Gulf of Mexico and Port Isabel in Cameron County. In A.D. 1528, Cabeza de Vaca crossed south Texas after being shipwrecked along the Texas Coast near Galveston Bay. However, de Vaca did not approach the Colorado River basin or the Guadalupe River region and ventured across the southern part of Texas. It was not until A.D. 1691, when Domingo Terán de los Ríos, led an expedition along the route that became known as the Camino Real, located a few kilometers to the west of Seguin that exploration of this region began (McGraw et al. 1998). The European intrusion into the indigenous population created considerable conflict, rapid movements, complex interactions, and rapid change.

Excavated archeological data is also scarce for these two periods, beginning with the arrival of the first Europeans exploring the broad unknown territories. This generally reflects a period from about 500 B.P. to the present. Identified cultural resource sites in the region have not been assigned to any specific native groups and the cultural material left behind may not be characteristic enough to actually assign a cultural assemblage to a named group. Again, the lack of major excavations has limited the data necessary to address which groups were using this region at the time of European settlement.

The following was extracted from the City of Seguin web page:

The community of Seguin was established in 1838 by members of Mathew Caldwell's Gonzales Rangers, but was not incorporated until 1853. It was originally called Walnut Springs for the nearby fresh water sources. Just six months later the name was changed to honor Colonel Juan N. Seguin, one of Sam Houston's ablest Lieutenants throughout the struggle for Texas' independence. As leader of a dedicated group of Texans of Mexican ancestry, Col. Seguin participated in the great victory at San Jacinto. Later he served as a Republic of Texas Senator and as Mayor of San Antonio (City of Seguin, 2014).

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4.0 ARCHEOLOGICAL SITE FILE SEARCH DATA

Benjamin G. Bury and J. Michael Quigg

4.1 INTRODUCTION

An archeological file search using the THC Archeological Sites Atlas (THC Atlas) was performed by TRC archeological staff on April 8 and 11, 2014 to compile current information on previously recorded cultural resources that are within a 1 mi. (1.6 km) radius of the APE. Other documents including historic topographic maps, Guadalupe County General Highway Map (Texas State Highway Department 1960), United States Geological Survey (USGS) Seguin Quadrangles from 1924 and 1953, and maps from the Historic Texas Overlay database were also reviewed. Results of these searches are provided below.

According to the current online version of the THC Atlas (http://nueces.thc.state.tx.us/; accessed 4/8/2014), no archeological sites, cemeteries, National Register structures, historic landmarks, or any other cultural resources have been documented within, or immediately adjacent to the APE.

4.2 PREVIOUS CULTURAL RESOURCE INVESTIGATIONS

One prehistoric archeological site (41GU21) is located within 1 mi. (1.6 km) of the APE. Site 41GU21 is on private land approximately 0.31 miles (0.5 km) northwest of the APE on the high terrace on the northern side of the Guadalupe River. It is extensive and extends for about 0.75 mi. (1,207 m) long from State Highway 466 on the western end, eastward to almost Geronimo Creek on the eastern end. The site was reported in 1979, and has been previously, collected, looted and disturbed by recent housing construction activities off Hullub Lane. The cultural assemblage included burned rocks, lithic debitage, lithic tools, projectile points, and preforms.

A second site (41GU142), although beyond the one mile radius, is in a similar topographic setting as the proposed APE, as it is buried in a Holocene terrace on the south side of the Guadalupe River. This site documents the potential for buried sites in the Holocene alluvium in the region.

No historic structures were found within or adjacent to the APE during a review of the Guadalupe County General Highway map (Figures 4-1 and 4-2) (Texas State Highway Department 1960). Similarly, no historic structures were found within or adjacent to the APE during a review of the United State Geological Survey Seguin Quadrangles from 1924 and 1953. The closest structure is depicted approximately 0.35 mi. (0.56 km) south of the APE, and across the Guadalupe River.

4.3 POTENTIAL FOR CULTURAL RESOURCES

Given the presence of deep Holocene alluvial deposits, the probability of the APE to contain buried prehistoric cultural resources in a primary context is high. Based on a review of historic maps of the area, no historic structures are likely to be present within the APE.

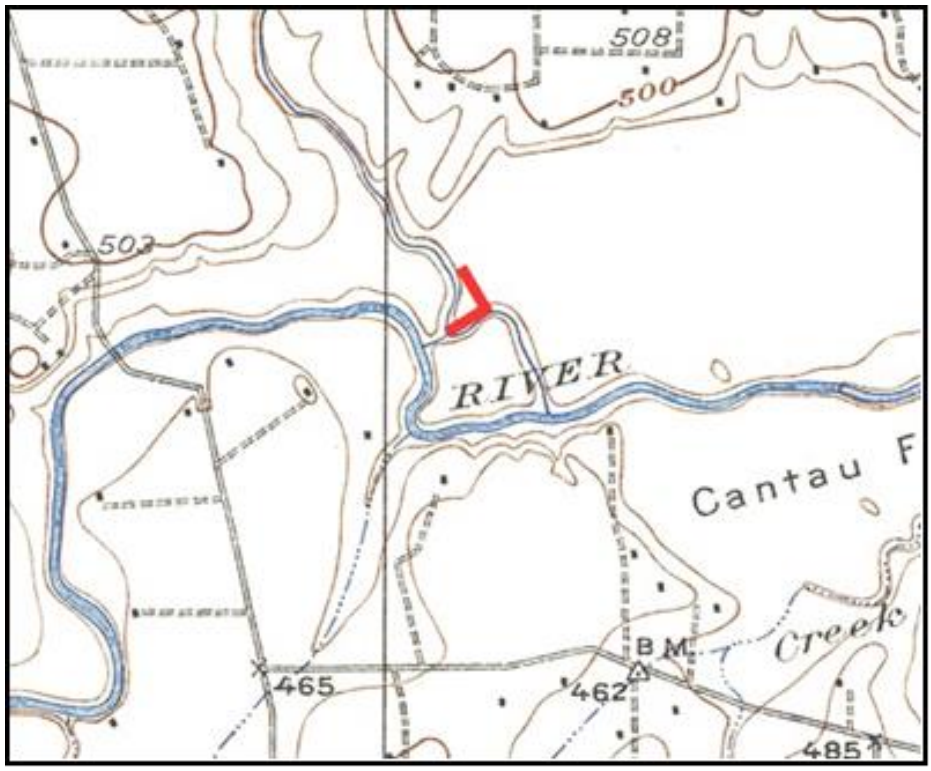

Figure 4-1. Proposed project APE on the USGS Seguin Quadrangle (1924) topographic map depicting no historic structures in the immediate vicinity of the area of potential effect (bold red line).

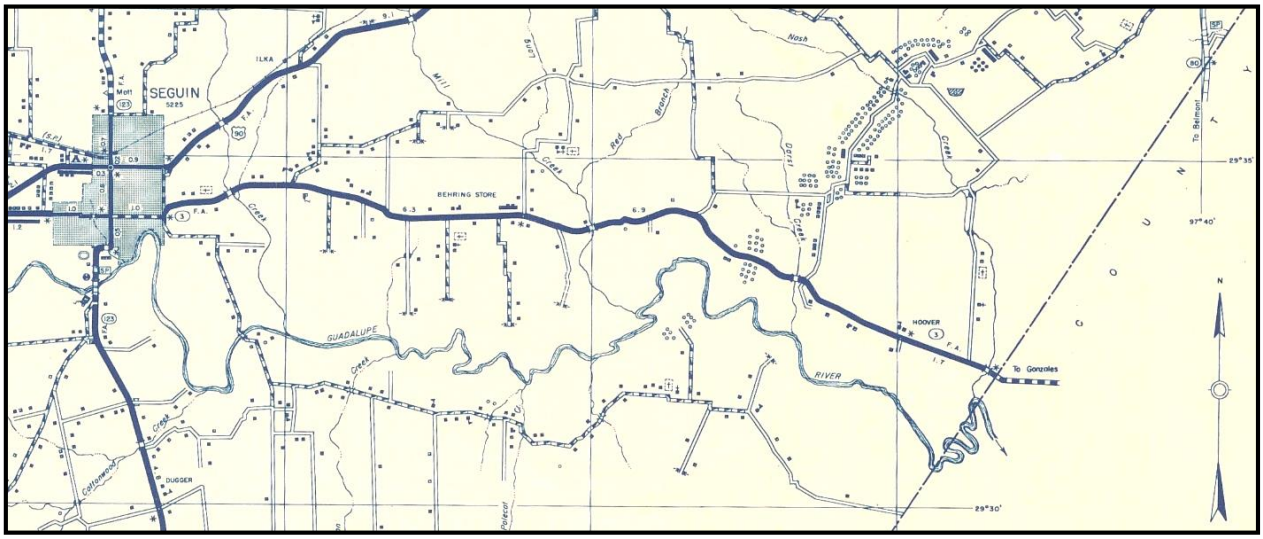

Figure 4-2. Eastern portion of Texas general highway map of Guadalupe County, Texas from 1936 depicting no structures immediately along APE at the confluence of Geronimo Creek and Guadalupe River southeast of Seguin.

5.0 RESEARCH OBJECTIVES AND METHODS

J. Michael Quigg

5.1 INTRODUCTION

The intensive archeological survey described in this report was undertaken with three primary goals in mind:

- To determine if any archeological resources are within the APE.
- To provide a preliminary assessment of the significance of any archeological resources encountered regarding potential for inclusion in the NRHP and/or for designation as State Antiquities Landmarks (SALs).
- To make recommendations for the treatment of any archeological resources identified based on their NRHP and/or SAL assessments.

5.2 ARCHEOLOGICAL FIELD INVESTIGATION METHODS AND CONDITIONS

Field methods followed THC archeological survey standards, which call for field investigations to involve a 100 percent pedestrian survey of the APE and the excavation of backhoe trenches in areas of deep Holocene alluvium. Those survey standards were followed here.

The APE of some 535 ft. (163 m) in length, and 70 ft. (21.3 m) in width for a total of 0.85 acres, which crossed three very distinct alluvial terrace surfaces (T_1 through T_3), was 100 percent inspected by foot traversing the area. The entire surface has been altered in modern times from its natural state as all terraces are now part of a large pecan orchard.

Figure 5-1. Proposed outfall location on east side of Geronimo Creek depicting nearly vertical cutbank of lower terrace (T_1) that is heavily vegetated.

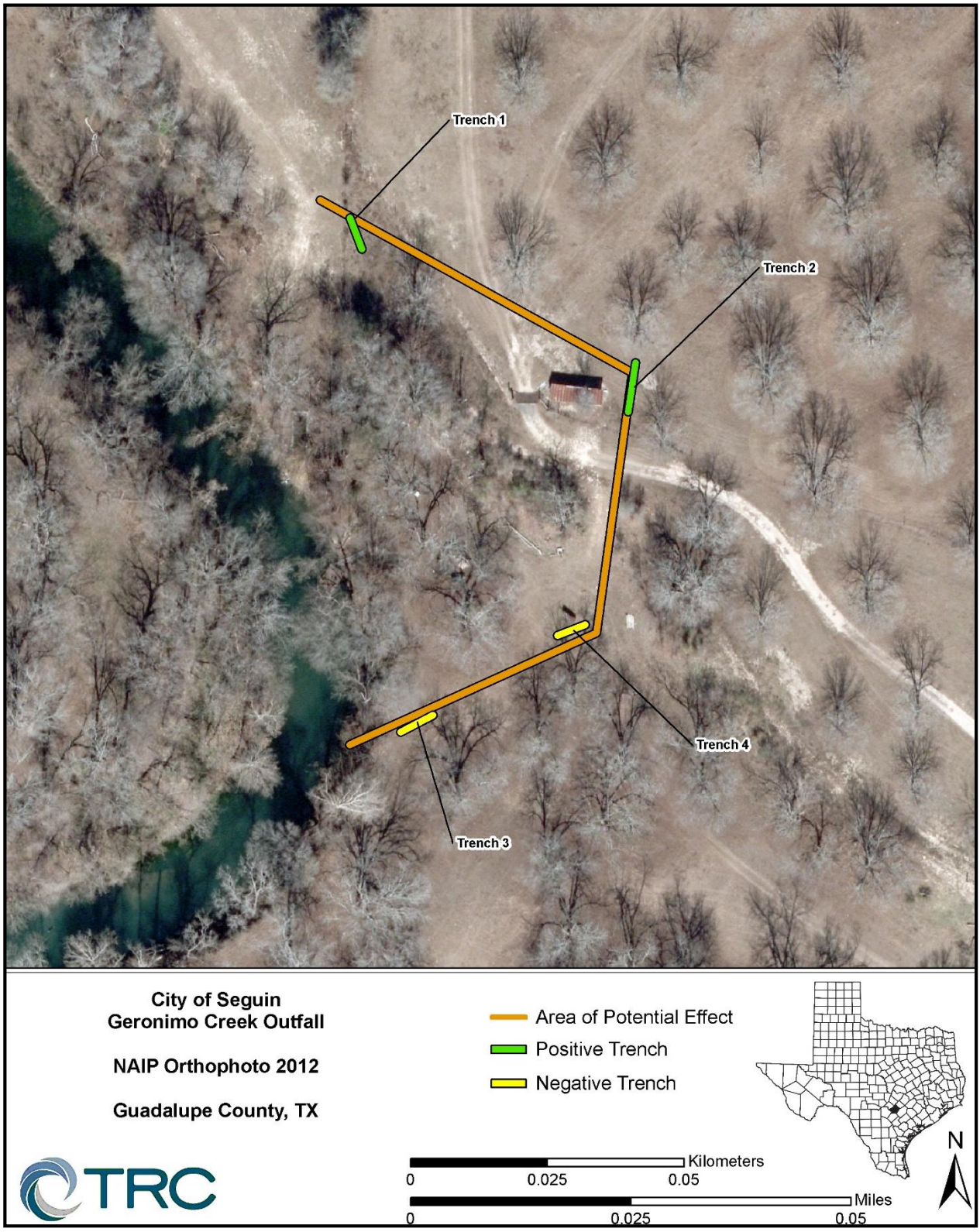

Figure 5-2. Location of four backhoe trenches along the area of potential effect.

Figure 5-3. Backhoe Trench 1 showing safety benches and archeologist troweling down the walls searching for buried cultural materials.

A number of unimproved two-track roads, some with added river gravels, multiple barbwire fences, a Texas cattle gate, and a corrugated metal shed are in or cross the APE. At the proposed outfall area (see Figure 1-3) the creek banks are nearly vertical and heavily vegetated with trees, brush, and poison ivy (Figure 5-1). This limited access, exposures and visibility. A no collection policy was followed for cultural materials encountered during the field investigations.

The subsurface field investigations involved mechanical excavation of four backhoe trenches at or near the center line of the proposed APE (Figure 5-2). The backhoe was equipped with an 18 in. (45 cm) wide toothed bucket. As the trench depth increased benches/steps were created as a safety measure (Figure 5-3). Consequently, the top parts of the trenches were 4.9 to 6.6 ft. (1.5 to 2 m) wide, which generally narrowed with depth down to between 18 in. and 24 in. (45 to 60 cm) in width in the bottom. As the trenched increased in depth, the archeologist would periodically enter the trench and inspect the walls for cultural materials (see Figure 5-3). As the excavations proceeded and backdirt was dumped, the dirt was inspected in search of cultural materials. When potential cultural materials were encountered in the backdirt or in the trench, greater attention focused on that depth and troweled to search for more materials. In most instances entire trench walls were scrapped searching for cultural items. Photographs of the trench and walls were also taken and recorded. Notes on the soils zones were recorded and Munsell colors for general zones were noted.

Following the completion of the fieldwork an electronic Texas State Archeological Site Form was completed. This electronic form, a topographic map showing the site location and shape files were submitted to Texas Archeological Research Laboratory (TARL) to obtain a trinomial designation for this newly discovered archeological site.

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6.0 INTENSIVE SURVEY RESULTS

J. Michael Quigg

6.1 INTRODUCTION

As stated in the previous chapter, this cultural resources survey involved a 100 percent pedestrian survey and the excavation of four mechanical trenches into the deep Holocene alluvium along the approximately 535 ft. (163 m) long by 70 ft. (21.3 m) wide proposed APE for the total of 0.85 acres, which were along the eastern bank of Geronimo Creek just southeast of Seguin, Texas and near the confluence with the Guadalupe River (see Figure 5-2).

6.2 PEDESTRIAN SURVEY OBSERVATIONS AND BACKHOE TRENCH RESULTS

On October 14 and 15, 2014, TRC archeologists Mike Quigg conducted an intensive archeological field survey by pedestrian surveying the entire APE plus mechanical excavation of four backhoe trenches distributed along the proposed APE (see Figure 5-2). Survey conditions were good with bright, sunny 82°F (27.8°C) weather. Generally, surface exposure was poor with roughly 85 percent covered in low vegetation with only limited exposed ground (Figure 6-1).

During the pedestrian surface inspection of the APE a few prehistoric artifacts (i.e., flakes) were observed on the upper terrace (T_3) surface in exposed areas. No historic standing structures or foundations greater than 50 years old were observed in the APE. The landowner, Mr. Gary Rainwater has a small corrugated metal shed framed with milled lumber and round posts using rounded nails in the APE (see Figure 1-3; Figure 6-1) plus a modern picnic area (i.e., metal tables, refrigerator, barbeque, sinks, and electricity) near the proposed outfall area on the lower terrace (T_1), but these facilities are less than 50 years old (Gary Rainwater personal communication October 2014).

Figure 6-1. Modern corrugated metal shed on margin of area of potential effect near first proposed manhole/bend in proposed sewer line in upper terrace (T_3) (photograph by Todd Schnakenberg).

Table 6-1. Backhoe Trench Data from Geronimo Creek Outfall Are of Potential Effect.

Trench No.	BT 1	BT 2	BT 3	BT 4
Length (m)	6.5	5.5	5	6.5
Base Width (cm)	60	45	50	60
Depth (cm)	200	290	360	190
Screened	No	No	No	No
Cultural Material Observed	Burned rocks (30+), mussel shells, chert flakes	Burned rocks (30+), mussel shells, chert flakes	None	None
Soil Type	Bosque loamy	Bosque loamy	Bosque loamy	Bosque loamy
Comments	Multiple lenses of cultural materials at ca. 120, 140-150, 155-160 cmbs	Multiple lenses of cultural materials at ca. 130, 145-160, 165-180 cmbs	None	None

Two of the four backhoe trenches (BTs 1 and 2) revealed deeply buried cultural artifacts (Table 6-1). Both positive trenches were excavated into the upper terrace (T_3) deposits along the western edge of the existing pecan orchard (see Figure 5-2).

Backhoe Trench 1 (BT 1) was located on the northwest corner of the proposed sewer line that crosses the upper T_3 terrace (see Figure 5-2; Figure 6-2). The trench measured roughly 6.5 m long, 60 cm wide at the bottom, and dug to between 190 and 200 cm deep (Figure 6-3). Trench walls were inspected and revealed at least three levels of cultural materials, dominated by burned rocks. A small (<2 cm long) poorly preserved long bone fragment in the deer size range was at roughly 25 cm below surface. Two small mussel shells and three to four burned rocks were at roughly 120 to 125 cm below surface. Between roughly 140 and 147 cm below surface was at least three burned rocks in the walls. Between roughly 155 and 160 cm below surface were at least four burned rocks in the walls plus three chert flakes apparently came from this lower zone. The northern end wall of BT 1 revealed multiple burned rocks at different elevations to clearly indicate multiple occupation surfaces (Figure 6-4). From this very limited exposure and the backdirt findings at least three chert flakes, four mussel shell fragments, and some 30 major chunks of burned rocks were recovered (Figure 6-5). Most burned rocks were sizeable chunks of limestone with a few pieces of sandstone. No bone fragments or charcoal pieces were observed in the major occupation zones in the trench walls or recovered from the backdirt. The only bone observed was the one presented above at roughly 25 cm that lacked any recognizable cultural materials in association. The bottom of the trench exposed a very uneven, indurated white limestone (see Figures 6-3 and 6-4).

Backhoe Trench 2 was just west of the metal shed on the same upper T_3 terrace at the corner where a manhole is proposed on the line (see Figure 5-2; Figure 6-6). The trench measured roughly 5 m long,

Figure 6-2. Backhoe Trench 1 location on upper terrace (T_3), view north with existing sewer line in open area in left background.

Figure 6-3. Overview of Backhoe Trench 1 profile in the upper terrace (T_3), view east, with white limestone bedrock showing in bottom at a depth of roughly 200 cm below surface. Note trowel marks burned rocks in one of the multiple occupation zones at roughly 180 cm below surface.

Figure 6-4. Close-up of northern end wall profile of Backhoe Trench 1 showing multiple zones of buried cultural materials, gray burned rocks at 122, 130, and 180 cm below surface. Note the mottled white is the basal limestone.

Figure 6-5. Close-up of recognized cultural materials (i.e., burned rocks, flakes, mussel shells) from multiple cultural zones between 120 and 170 cm below surface in Backhoe Trench 1.

roughly 45 cm wide at the bottom, and between 280 and 290 cm deep (Figure 6-7). In the walls of this trench were at least three levels of cultural materials, again dominated by burned rocks. A small chert flake was at roughly 85 cm below surface. Two small rounded apparent burned rocks were at about 130 cm below surface. Below that, between 145 and 160 cm was a lens of cultural materials dominated by burned rocks with at least one chert flake, and one mussel shell. Some 15 pieces of burned rock were observed in the walls along a 230 cm section of the trench. Below that was another cultural zone between 165 and 175 cm below surface. This was most obvious in the western end wall were 6 to 7 burned rocks in a linear space of 60 wide (Figure 6-8). From the two lower cultural zones between 145 and 175 cm below surface some 35 relatively large chunks of burned rocks were observed in the backdirt (Figure 6-9).

Backhoe Trenches 3 and 4 were dug in the lower T_1 terrace within the APE (see Figure 5-2; Figure 6-10). This is a grass covered terrace that is nearly flat and adjacent to both Geronimo Creek on the west and the Guadalupe River on the south with and old abandoned creek channel on the east. The alluvial deposits in BT 3 revealed repeated dark zones that represent stable periods with light colored flood zones alternating from roughly 50 cm deep to about 280 cm below the surface. In nearly all instances the boundaries were irregular. A couple of the more stable (dark zones) surfaces were at about 240 and 260 cm below surface (Figure 6-11). No cultural artifacts, rocks or mussel shells were observed in the backdirt or in cleaning the trench walls. This trench was unusually sterile with the exception of few scattered snail shells

Backhoe Trench 4 was at the foot of the slope of the second terrace (T_2) at the back edge of the T_1 terrace just east of the picnic area (see Figure 5-2; Figure

Figure 6-6. Overview of Backhoe Trench 2 location on the upper terrace (T_3) next to metal shed. View southeast.

Figure 6-7. Overview of Backhoe Trench 2 profile on the upper terrace (T_3), view north west with cultural burned rocks from trench on step in forground.

Figure 6-8. Close-up of Backhoe Trench 2 end wall profile depicting one well-defined culutral zone at 165 cm below surface. Note six burned rocks in wall in 60 cm wide trench.

Figure 6-9. Close-up of recognized cultural materials (i.e., burned rocks and flakes) from multiple cultural zones between 150 and 170 cm below surface in Backhoe Trench 2.

Figure 6-10. Overview of Backhoe Trench 3 location on low Terrace (T_1) with picnic area in background. Note the proposed outfall is to the left of picture.

Figure 6-11. Overview of Backhoe Trench 3 profile in lower T_1 terrace depicting multiple zones of stable surfaces (darker zones) and thin flood events (light colors) to a depth of 3 m (12 ft.), view eastward.

Figure 6-12. Overview of Backhoe Trench 4 location with picnic area in background at back edge of low terrace (T_1), view is northwest.

Figure 6-13. Overall profile of east wall of Backhoe Trench 4 in low terrace (T_1).

6-12). The trench profile revealed very faint indications of repeated stable periods (dark colored zones) with occasional flood deposits (light colored zones) that are not well-defined (Figure 6-13). No prehistoric artifacts were recovered or observed in this trench. An irregular sheet of rusted metal, a small diameter white water line and an electrical cable to the picnic area were also at the northern end and in the upper 30 cm.

The cultural materials detected in BTs 1 and 2 appeared to represent a single, buried archeological site as the two trenches encountered similar deposits on the same landform. A Texas State Archeological Site Form was completed and submitted to the TARL at The University of Texas in Austin for assignment of a trinomial number. The number 41GU168 was assigned to this locality. As currently determined from two spatially separate backhoe trenches site 41GU168 consists of stratified buried prehistoric campsites in the T_3 terrace overlooking the Guadalupe River on the east side of Geronimo Creek. Multiple levels of mostly burned rocks at depths greater than 100 cm below surface were detected. The amount of burned rocks and the presence of lithic debitage from stone tools manufacture indicate this location was repeatedly occupied by multiple groups who conducted multiple activities. It is likely that the quantity of burned rock encountered in such a small trench represented at least one cultural feature in each of the trenches. The actual ages of the events are unknown and the deposits revealed no obvious charcoal in which a radiocarbon date could be obtained and no diagnostic artifacts were detected. Based on the depth and the apparent lack of organic remains it is likely these occupations are at least thousands of years old.

7.0 SUMMARY AND RECOMMENDATIONS

Under Texas Antiquities Permit #7007 issued by the THC, TRC archeologists were tasked to determine if cultural resources were present in the APE, and if present, to determine if the discovered cultural resources constitute significant historic properties as defined by the Antiquity Code of Texas 1977 (revised 1987, Title 9, Chapter 191, VACS, Art. 6145-9) and National Historic Preservation Act (NHPA) of 1966 (P.L. 89-665; 80 Stat. 915; 16 USC §470 et seq.).

If resources are found and constitute historic properties, the investigator must attempt to assess their eligibility for nomination to the National Register of Historic Places (NRHP). According to the NHPA of 1966 (Section 106), a Federal agency must assess any potentially harmful action upon resources that are or could be listed on the NRHP. Federal Regulations (36 CFR 60.4) lists four criteria to be used when evaluating properties for nomination to the NRHP. Those eligible should include properties:

a) That are associated with events that have made a significant contribution to the broad patterns of our history; or

b) That are associated with the lives of persons significant in our past; or

c) That embody the distinctive characteristics of a type, period or method of construction, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d) That has yielded, or may be likely to yield, information important in prehistory or history.

The proposed new Geronimo Creek outfall replacement project southeast of City of Seguin with the APE defined as an area measured 535 ft. (163 m) long by 70 ft. (21.3 m) wide for a total of 0.85 acres, follows the eastern bank of Geronimo Creek with the new outfall into the creek about 200 ft. (61 m) south of the existing outfall. This APE was subjected to an intensive cultural resource inspection by a professional archeologist that included; 100 percent pedestrian survey with generally poor surface visibility, whereas the deep Holocene alluvial deposits were investigated through mechanical trenching of four locations (BTs 1 through 4) distributed along the entire proposed APE. This investigation met the Council of Texas archeological standards and the THC standards for this project.

The surface inspection revealed a few prehistoric cultural items (i.e., flakes and burned rocks) in a few exposed surfaces on the upper high terrace (T_3), with no historical structures older than 50 years within the proposed APE. Two of the four backhoe trenches (BTs 1 and 2) in the APE across the upper T_3 terrace revealed one deeply buried prehistoric site (41GU168) with multiple stratified occupations of potential significance to contribute important information to Texas prehistory. The two trenches (BTs 3 and 4) in the lower T_1 terrace did not reveal any buried prehistoric artifacts or cultural sites. TRC recommends avoidance of prehistoric site 41GU168 buried in the upper T_3 terrace, but if it cannot be avoided then TRC recommends further testing to assess the sites significance and its potential to yield significant information important in prehistory, either locally, regionally or nationally, per the NRHP.

The City of Seguin reviewed the draft report, the archeological findings, and recommendations by TRC archeologists and sought an alternate route for

the proposed sewer line to avoid impact to cultural resource site 41GU168. The City and its engineers agreed to an alternate reroute satisfactory with the landowner that avoids the upper terrace and the archeological site altogether (Figures 7-1 and 7-2). The proposed reroute will begin on the lower terrace in disturbed deposits of the existing sewer line at the north end and the line will be bored southward under much of the lower terrace until the turning point where it turns westward to the outfall structure. This point at the southern end was determined to have no buried archeological materials present in the previous trenching. This proposed reroute successfully avoids and preserves deeply buried prehistoric site 41GU168 in place. TRC now recommends no further cultural resource investigation following the new proposed sever line location.

Figure 7-1. Original proposed route (yellow line) and proposed reroute (red line) of sewer line to avoid prehistoric site 41GU168 on the upper T_3 terrace (white arrow).

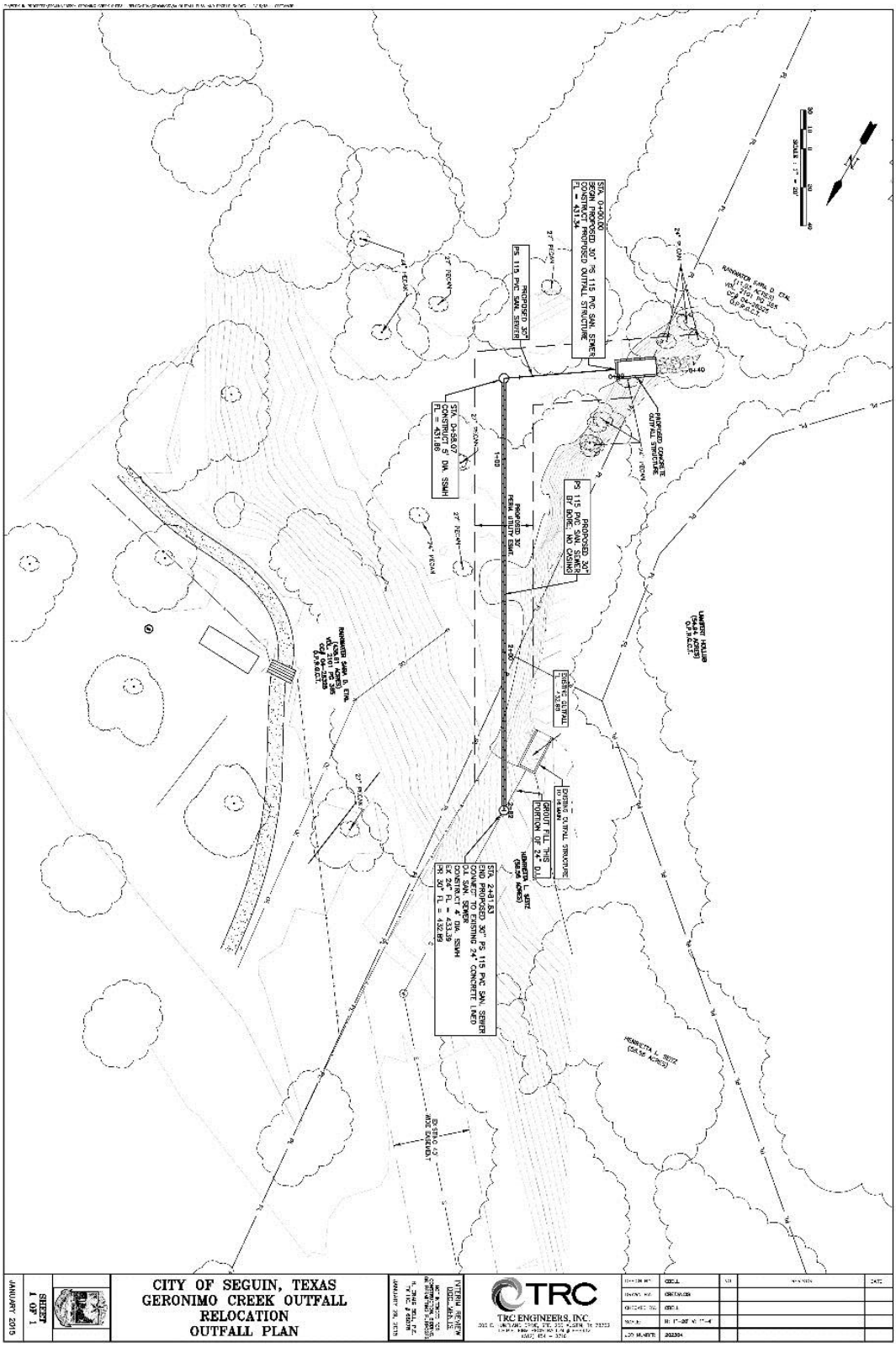

Figure 7-2. Detailed engineering drawing of proposed reroute from existing sewer line in lower terrace (T_1) that avoids prehistoric site 41GU168 on the higher T_3 terrace.

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