ARCHEOLOGICAL SURVEY FOR THE CULEBRA CREEK NWWC DRAINAGE PROJECT, SAN ANTONIO, BEXAR COUNTY, TEXAS

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by

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Adams Environmental, Inc.
San Antonio, Texas

and

City of San Antonio
Transportation and Capital Improvements

by

Prewitt and Associates, Inc.
Cultural Resources Services
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FINAL REPORT

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ABSTRACT

On August 31, 2017, personnel from Prewitt and Associates, Inc., conducted an intensive archeological survey on Culebra Creek in west-central San Antonio, Texas, for Adams Environmental, Inc., and the City of San Antonio under Texas Antiquities Permit No. 8145. This work was completed prior to proposed channel improvements below existing bridges at Culebra Road and Timber Path. The horizontal Area of Potential Effects (APE) for the project is 10.6 acres of city-owned property composed of 1.7 acres at Culebra Road and 8.9 acres downstream at Timber Path. The APE segment at Culebra Road encompasses a 380-ft-long by 165-ft-wide bridge corridor, with a 45-ft-wide corridor for a proposed pilot channel stretching 95 ft east and 160 ft west. The APE segment at Timber Path encompasses a 510-ft-long by 130-ft-wide bridge corridor, with a 175-ft-long by 45–80-ft-wide area for a proposed pilot channel west of the bridge and a 7.4-acre area slated for various channel improvements east of the bridge corridor.

Review of topographic maps, aerial photographs, satellite imagery, and project schematics before the field investigation revealed extensive disturbance in the project area derived from previous channel modification and road and bridge construction. The field investigation included pedestrian survey and the excavation of nine shovel tests in and adjacent to the APE. The field investigation identified shallow surface soils, surface or near-surface gravel deposits, and exposed limestone bedrock across the project area. No artifacts or archeological sites were found. Furthermore, the APE does not include surface soils of sufficient depth to contain buried archeological sites. Based on this observation, the APE has very little potential for intact archeological deposits that meet eligibility criteria for listing in the National Register of Historic Places or designation as a State Antiquities Landmark. Therefore, Prewitt and Associates, Inc., recommends that the proposed project be allowed to proceed without additional archeological investigations.

CURATION

The archeological survey did not find any artifacts, so the project does not require artifact curation. Project records and photographs currently housed at the offices of Prewitt and Associates, Inc., will be transferred to the Texas Archeological Research Laboratory in Austin for permanent curation.

INTRODUCTION

On August 31, 2017, personnel with Prewitt and Associates, Inc., conducted an intensive archeological survey prior to proposed channel improvements below existing bridges on Culebra Road and Timber Path at Culebra Creek in west-central San Antonio, Texas (Figure 1). This survey was conducted under the direction of Adams Environmental, Inc., for the City of San Antonio (COSA) under Texas Antiquities Permit No. 8145. All work complied with Section 106 of the National Historic Preservation Act of 1966, as amended, and associated regulations 36 CFR 800 since proposed channel improvements require Clean Water Act Section 404 permits be issued by U.S. Army Corps of Engineers. Fort Worth District. Work was also performed in accordance with the requirements of the Antiquities Code of Texas (Texas Natural Resource Code of 1977, Title 9, Chapter 191, VTCS 6145-9) and the City of San Antonio's Historic Preservation and Design Section of the Unified Development Code (Article 6 35-360-634).

According to the 70 percent design plans, the project Area of Potential Effects (APE) encompasses a total of about 10.6 acres, which is primarily restricted to the extensively modified channel of Culebra Creek. The APE at Culebra Road consists of 1.7 acres largely within the existing bridge corridor, with small areas of channel above and below it. The remainder of the APE (8.9 acres) encompasses the bridge corridor at Timber Path, a small channel segment above the bridge, and a larger channel segment below it. Pilot channels will be excavated below both bridges to direct stream flow, and a 30-inch-thick bed of partially grouted riprap (PGR) will be installed below each to stabilize the stream bed. PGR will be laid between existing concrete abutments below the bridges and will extend ca. 20 ft upstream and downstream of the 100-ft-wide bridge deck at Culebra Road and the 60-ft-wide deck at Timber Path. This riprap will line intersecting pilot channel segments, and it will be laid on the minimally modified bed of Culebra Creek and on existing concrete-stabilized surfaces north and south of the channels with minimal preparatory modification. The top-to-top bank width of the stream channel varies from 450 to 500 ft at the Culebra Road bridge and from 512 to 532 ft at the Timber Path bridge. Maximum channel depths at these locations are about 23 ft.

The pilot channel at the Culebra Road bridge will be about 416 ft long with a top-to-top width of 25 ft, floor width of 15 ft, and a depth that varies from 6.5 to 5 ft just above and below the bridge. A section of PGR approximately 315 ft long by 142 ft wide will be installed below the Culebra Road bridge. The pilot channel at the Timber Path bridge will be about 1,025 ft long with a top-to-top width that varies from 35 to 60 ft, floor width that ranges from 25 to 50 ft, and a depth of 1–2 ft. An approximately 470-ft-long by 105-ft-wide section of PGR will be installed below the Timber Path bridge.

Channel modifications downstream of Timber Path include cutting and grading the channel floor to drain toward the pilot channel or the centerline of the larger streambed and cutting channel walls. On the stream bed, this effort will entail vertical cuts with a maximum depth of 10 ft and horizontal cuts over a maximum distance of 250 ft. Channel walls will be cut back as much as 10 ft in places. The lower

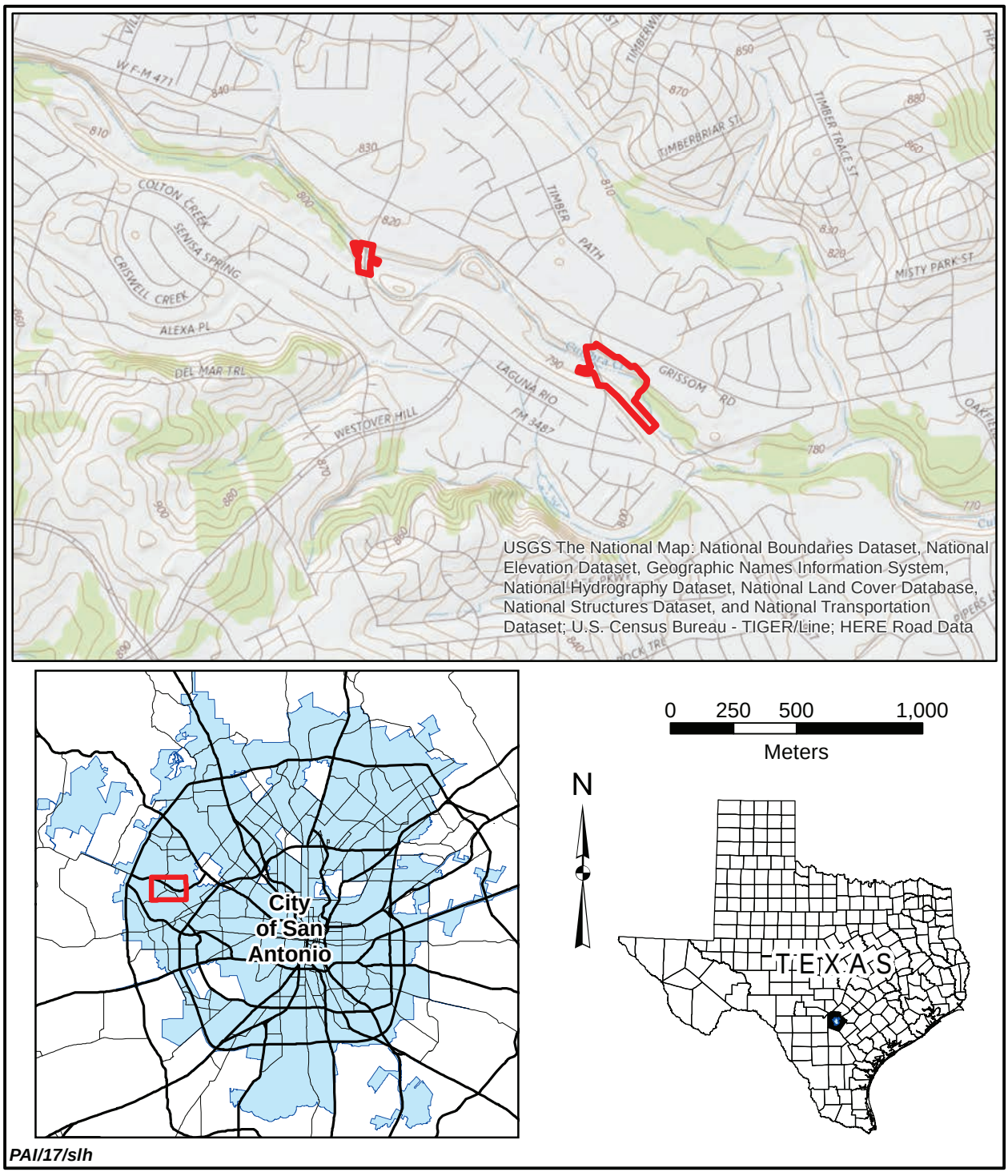

Figure 1. Project location map. The Culebra Road survey area is to the west, and the Timber Path survey area is to the east. Base image is a segment of the USGS 7.5-minute Culebra Hill quadrangle map (U.S. Geological Survey 1993).

half of the south bank wall will be cut to a 3:1 grade for an approximate distance of 830 ft below the bridge. The north channel wall will be extensively modified. The lower half of the existing bank wall will be cut back and the vertical face stabilized with a 600-ft-long, 7–16-ft-tall concrete retaining wall reinforced by concrete soldier piles 18.5–22.5 ft long set in structural concrete shaft backfill extending 10–15 ft below the wall. The piles will be 8 ft on center, and ground anchors inset in these will extend 25 ft into the terrace deposits behind the retaining wall. The bank above the retaining wall will be modified to a 3:1 grade and faced with concrete. A new concrete flume will run along the base of the concrete apron behind the retaining wall. Segments of existing asphalt and fill along the top bank edge will be removed to a depth of 6 ft, replaced with backfill, and capped with a new asphalt sheet. Finally, the bank wall below (east) of the retaining wall will be modified to a 3:1 grade for an approximate total length of 400 ft. CPS Energy will relocate a subsurface gas line and eight overhead utility poles in advance of this project.

ENVIRONMENTAL SETTING

The APE is restricted to the channel and adjacent terrace margins of a portion of Culebra Creek on the leading edge of the Balcones Escarpment in west-central Bexar County. This segment of the intermittent stream is along the transitional boundary between the Blackland Prairie to the southeast and the Edwards Plateau to the northwest (Arbingast et al. 1973:12; Griffith et al. 2004; McMahan et al. 1984:Figure 1). The Blackland Prairie is characterized by rolling tall grasslands underlain by soft limestones, marls, and chalks, whereas the scarp along the edge of the Edwards Plateau is a rugged, dissected landscape of limestone hills and canyons created by extensive stream downcutting and headward erosion.

According to the Geologic Atlas of Texas (Bureau of Economic Geology 1983), this segment of Culebra Creek incises a wide band of Pleistocene terrace alluvium that is inset into Upper Cretaceous Austin Chalk. Mapped terrace deposits are composed of gravels, sands, silts, and clays. No Holocene alluvium is mapped in the vicinity of the project area. Undifferentiated, nearly level, frequently flooded Tinn and Frio soils are mapped on the restricted floodplain of Culebra Creek. These very deep, moderately well-drained soils formed in calcareous loamy and clayey alluvium derived from ancient geologic deposits. Soils mapped on low Quaternary terraces south of the creek include nearly level Lewisville silty clay at Culebra Road and nearly level Sunev loam at Timber Path. These very deep, moderately well to well-drained alluvial terrace soils formed in ancient calcareous loamy and clayey sediments. Nearly level, rarely flooded Patrick soils mapped on terraces north of the creek at both crossings are characterized as moderately deep to gravelly, well-drained terrace soils that formed in clayey and gravelly alluvium derived from Cretaceous-age sedimentary rock. Tinn series soils are Vertisols; all other listed soils are Mollisols (SoilWeb 2017).

The Bexar County climate is classified as modified subtropical and is predominantly marine in the summer and continental in the winter (Taylor et al. 1991:102). The climate of the Blackland Prairie physiographic unit is classified as modified humid subtropical with Gulf-influenced hot summers and continental-

influenced mild winters. The Edwards Plateau physiographic unit is classified as subtropical steppe (Natural Fibers Information Center 1987:10–12). Seasonal temperature extremes exceeding 100°F and dipping below 32°F occur in both regions but are more frequent on the Edwards Plateau. The mean annual precipitation for Bexar County is 29.1 inches (739 mm). Precipitation is distributed throughout the year, with peaks in the late spring and early fall months (Natural Fibers Information Center 1987:49; Taylor et al. 1991:102).

As with landscape and climate, the biota of Bexar County differ east to west with geographical overlap of some species. Flora and fauna of the Edwards Plateau and Blackland Prairie are defined as Balconian and Texan, respectively (Blair 1950). Although the dominant vegetative regime for the project area was previously listed as mesquite-live oak-bluewood parklands (Frye et al. 1984), the area is now characterized by extensive suburban development. The region once supported short to tall grasses with widely scattered mesquite, elm, hackberry, and pecan trees on stream terraces and denser stands of elm, hackberry, oak, pecan, and ash trees along tributary channels (SoilWeb 2017).

RESULTS OF FILE SEARCH AND POTENTIAL FOR ARCHEOLOGICAL SITES

Review of the Texas Historical Commission's Archeological Sites Atlas on August 10, 2017, revealed 7 recorded prehistoric archeological sites (41BX776 and 41BX1592–41BX1597), 1 historic archeological site (41BX617), and 12 previous archeological investigations within 1 km of the APE. All of the documented prehistoric sites are closest to the east half of the APE (Timber Path bridge). Site 41BX776 was recorded on private property by an avocational archeologist in 1987. About 0.6 km southwest of the APE, the site was described as an open camp with a buried burned rock midden on a high bluff above an intermittent lateral drainage of Culebra Creek. The site had been almost completely destroyed by looting when it was recorded. Landowners noted the discovery of one indigenous burial at the site, and dart points collected by them indicated the presence of a Late Archaic component.

The other six prehistoric sites were recorded 0.5–1.1 km east of the APE during an intensive archeological survey conducted by Tierras Antiguas for the Texas Parks and Wildlife Department and COSA in 2002 (Nickels 2004). The surveyed property would later become Cathedral Rock Nature Park. Five sites were classified as open campsites with hearth remnants (41BX1592 and 41BX1593), open campsites with fire-cracked rocks (41BX1594 and 41BX1596), and a sparse lithic scatter with fire-cracked rocks (41BX1595). Sites 41BX1592, 41BX1593, 41BX1595, and 41BX1596 were on terraces north and south of the creek and had deposits that extended from or immediately below the surface to 30–70 cm below the surface. Site 41BX1594 was on a small sloped bench just east of the creek and had archeological deposits that extended to 70 cm below the surface. A biface was noted at 41BX1594, and informal tools were noted at 41BX1592 and 41BX1595, but no diagnostic lithic artifacts were recovered. The sixth site documented during the Tierras Antiguas survey (41BX1597) consisted of a fire-cracked rock and a core on a narrow bench west of Culebra Creek, about 1 m below a mammoth

tusk embedded in an overlying gravelly cutbank. The artifacts and the tusk were considered to be in secondary contexts and unrelated.

Site 41BX1593 was revisited during a 2008 Hicks and Company survey sponsored by COSA (Campbell and Jones 2009). This investigation extended the depth of known archeological deposits by 25 cm, but the investigators recommended no further work at the site. A 2011 transmission line corridor survey conducted by Atkins for CPS Energy of San Antonio passed through 41BX1593. Atkins personnel expanded the site area considerably and described the portion of the site within the right of way as a sparse surface and shallow subsurface scatter of lithic debitage. No further investigation was recommended (Robinson and Nash 2011).

In 2014, Pape-Dawson conducted State Antiquities Landmark eligibility testing at 41BX1592 at the request of COSA. This work was done in advance of proposed hike-and-bike trail construction for the Culebra Creek Greenway. This investigation recovered nearly 1,000 chipped stone artifacts (none of them temporally diagnostic) and identified two burned rock features with wood charcoal that dated to the Late Archaic period. Pape-Dawson found no significant prehistoric archeological deposits within or adjacent to the portion of the proposed trail alignment and recommended no further work in that portion of the site. They recommended that the central portion of the site is potentially eligible for State Antiquities Landmark designation due to the likely presence of additional burned rock features in that area (Nichols 2017).

The one historic archeological site (41BX1617) consisted of a single limestone structure that served as a stage coach stop on Culebra Road. The site was on a terrace on the north side of Culebra Creek, about 0.5 km west of the Culebra Road portion of the APE. Site 41BX1617 was recorded by COSA archeologist Kay Hindes in 2005. Personnel with Geo-Marine, Inc., revisited the site locality during a 2007 survey conducted for the U.S. Corps of Engineers and noted that the site had been destroyed by residential development.

Other archeological investigations conducted within 1 km of the APE include a 1979 area survey with the Environmental Protection Agency listed as the lead agency and a 2012 area survey conducted by Abasolo Archaeological Consultants with the U.S. Department of Housing and Urban Development listed as the lead agency. Both survey areas are north of the Culebra Road bridge. No archeological sites were documented during these investigations. A linear survey alignment depicted along present-day Grissom Road and another that followed a preexisting segment of the same road across Culebra Creek (and through the APE at Timber Path) were conducted in 1985. The Federal Highway Administration is listed as the lead agency for both surveys, and they may have been associated with the same project. Finally, a utility alignment surveyed by Geo-Marine, Inc., personnel in 2002 for the Texas Water Development Board passed through or close to both sides of the APE on the south side of the Culebra Creek channel. The survey alignment probably corresponds with an existing water main depicted on COSA schematics. No archeological sites are depicted in or within 1 km of the APE on these three alignments.

In addition to review of the Archeological Sites Atlas, the potential for historic archeological sites was assessed using several nineteenth- and twentieth-century maps obtained from the Texas Department of Transportation's Texas Historic Overlay and a series of historic and modern quadrangles and aerial photographs accessed through the NETR Online web viewer. The earliest examined map that could be reasonably linked to the modern landscape is Rullman's 1887 Map of Bexar County, which shows Culebra Road on the north side of Culebra Creek. The road curves southeast to cross the creek at about the east side of the APE, and it is clear from this and later maps that the original stream crossing was eventually improved and used until the mid twentieth century. No structures are depicted in the vicinity of the project area on the 1887 map. The 1903 San Antonio quadrangle (U.S. Geological Survey 1903) shows no development in the vicinity of the project area aside from the main road noted above and several secondary roads branching off of it. A structure is depicted on a tributary roughly 700 m northeast of Culebra Creek, and a turn-out and structure depicted west-northwest of the project area likely correspond with the documented stage stop (41BX1617). The 1918 Lytle quadrangle (U.S. Army Corps of Engineers 1918) depicts essentially the same network of roads that is shown on the 1903 quadrangle and shows the previously noted farmstead northeast of Culebra Creek, but the stage stop is not depicted. The 1918 map also depicts a structure near the valley wall, west of the Timber Path segment of the APE, with plowed fields south of the creek. The 1927 West San Antonio quadrangle (U.S. Army Corps of Engineers 1927) shows minor development in the form of structures and windmills along and to the north and south of the old stage road, but these agricultural units are widely dispersed on the landscape. The farmstead west of the Timber Path APE segment is labeled H. Weimer on the 1927 quadrangle, and property fence lines are depicted for the first time. The 1953 Culebra Hill quadrangle (U.S. Geological Survey 1953) shows a minimally developed rural area with single structures and farm/ranch compounds distributed along area roadways. Compounds close to the project area include one at the old stage stop, another north of present-day Grissom Road about equidistant between the east and west parts of the APE, and at the previously labeled H. Weimer compound south of the creek. These and other agricultural compounds are visible on a 1955 aerial photograph (NETR Online 2017). More importantly, the historic photograph shows trees along the broad Culebra Creek channel and on the valley walls, but the valley floor is free of visible vegetation and clearly used for crop agriculture and pasturage. The original Culebra Road crossing was modified between 1955 and 1963 and used up into the 1980s. Timber Path follows this modified alignment across and north of the creek. The present Culebra Creek bridge and the road segment south of the creek were constructed in the early 1980s, which coincided with encroaching residential development on the north side of the creek. Residential development supplanted agricultural land south of the creek between ca. 1995 and 2010, when the Timber Path bridge was constructed (NETR Online 2017).

While the geologic and geomorphic characteristics of the project area suggest the Culebra Creek floodplain has some potential for naturally buried prehistoric sites, the distribution of documented prehistoric sites in the vicinity of the project area suggests the possibility of finding prehistoric sites on this landform is limited.

Four of the six sites recorded by Nickels (2004) were on terraces adjacent to the channel, whereas only one not attributable to secondary deposition was on a bench along the creek. This small sample of prehistoric sites and the position of the one nearby historic site suggest the terraces along the wide channel are better suited to human occupation and thus the landforms most likely to contain archeological deposits. However, the APE encompasses only minor segments of terrace tread, most of which has been impacted by previous channel modification and other development. Given these factors and the morphology of the stream channel, the potential for prehistoric sites in the APE is limited, and deeply buried sites are unlikely.

Aside from historic-age road segments that pass through the east half of the APE and are clearly visible east of Timber Path on Google Earth satellite imagery, the potential for historic archeological sites in the project area is very low. Review of historic maps and aerial photographs showed little development in the area prior to the last 40–50 years aside from agricultural modification of the landscape, and structures depicted on twentieth-century maps were again situated on terraces above Culebra Creek or set on higher terrain well away from the stream channel.

RESULTS OF THE SURVEY

Field investigations consisted of pedestrian survey with examination of vegetation-free surface exposures and shovel testing where appropriate within the 10.6-acre APE. In general, the north and south edges of the APE are defined by the top edges of the present channel and the limits of adjacent retail and residential development. The 1.7-acre segment of APE at Culebra Road encompasses a 380-ft-long by 165-ft-wide bridge corridor, with a 45-ft-wide corridor for a proposed pilot channel stretching 95 ft east and 160 ft west. The 8.9-acre segment of APE at Timber Path encompasses a 510-ft-long by 130-ft-wide bridge corridor, with a 175-ft-long by 45–80-ft-wide area for a proposed pilot channel west of the bridge and a 7.4-acre area slated for various channel improvements east of (below) the bridge corridor. Much of the APE below the bridge corridor extends from bank to bank and stretches for an approximate maximum distance of 830 ft below it.

Channel walls and floors have been cut and graded repeatedly in the vicinity of both bridges, and gravel bars and previous road construction materials have been mechanically moved away from them to provide right of way clearance and facilitate stream flow. Less-disturbed and unmodified segments of the broader Culebra Creek channel floor southeast of Timber Path include surfaces marked by flood chutes, wider depressed areas, and a series of braided channels. The largest channels in these areas have cut through coarse- and fine-grained deposits to expose limestone bedrock. In situ remnants of the earlier, abandoned roadways are visible in the east half of the APE, and demolition debris from them is scattered across the project area east and southeast of Timber Path. The north bank wall east of Timber Path has been impacted by erosion, mechanical excavation, road and retail construction, and modern dumping.

Subsurface and overhead utilities cross through the APE. A sewer main crosses the south sides of both APE segments. The line runs along the modified

channel floor before transitioning to the top edge of the previously cut and graded bank or terrace southeast of Timber Path. Manholes for this line are in or immediately adjacent to the APE at both bridges. A water main crosses underneath the Timber Path bridge and follows the sewer main along the bank edge southeast of the bridge. A gas line parallels the east side of the abandoned roadbed that stretches from Timber Path to the southeast end of the APE. An overhead utility alignment runs between the gas line and existing Culebra Creek channel for about the southern third of the Timber Path APE, turns north to cross the channel, and continues northwest along the wall of the north bank. Three other utility poles sit on the extreme northeast edge of the Timber Path APE segment.

Surface visibility in the APE typically varied from 0 to 30 percent, with higher visibility on the channel floor, on cut banks and bench margins along existing channel segments, on portions of the north bank wall, and along two-track roads and abandoned roads. Nine shovel tests were excavated in and immediately adjacent to the APE (Figure 2). Shovel Tests 1 and 2 were placed near the ends of the proposed pilot channel below Culebra Road. Shovel Tests 3–9 were southeast of Timber Path on the channel floor, at the foot of the channel wall, and on terrace margins north of the creek. Shovel tests were not systematically spaced along survey transects. Most of the tests were placed in locations that appeared to be relatively undisturbed and/or appeared to have the greatest potential for archeological deposits according to landform. Some of the tests were excavated to demonstrate the character of the subsurface deposits in areas otherwise obscured by surface vegetation. If the APE acreage is rounded up to 11 acres, then the resulting shovel test density of 1 test for every 1.2 acres exceeds the Texas Historical Commission's minimum archeological survey standard of 1 test every 2 acres on tracts of this size. This level of effort is considered sufficient given the geomorphic setting of the APE and the extent and level of natural and artificial disturbance within it. Backhoe trenching is considered unnecessary within the APE for the same reasons.

Shovel tests were approximately 30 cm in diameter and were excavated in 20-cm levels when sediments allowed. Excavated sediment was screened through 1/4-inch-mesh hardware cloth or carefully sorted through with a trowel when too difficult to screen efficiently. A Shovel Test Record form was used to record brief sediment descriptions and notes about the presence of natural inclusions (e.g. snail shells), modern trash, and construction materials. The average shovel test depth was 29 cm, with depths ranging from 13 to 60 cm.

Shovel Test 1 was on a bench between the north bank wall and the existing stream channel near the west end of the proposed pilot channel. Natural benches in this location stand about 1.5 m above the floor of the channel, and these consist of 40 to 50 cm of sediment atop a thick gravel base. No artifacts were observed in the inspected cut banks, and none were recovered in Shovel Test 1. Sediment in the top 28 cm of the test consisted of moderately consolidated brown silt loam that graded to silty clay with depth. This sediment contained occasional fine gravels and abundant snail shells. Pieces of plastic and rubber were common in the top 15 cm. The next layer of sediment, exposed to a depth of 35 cm, consisted of well-consolidated, light

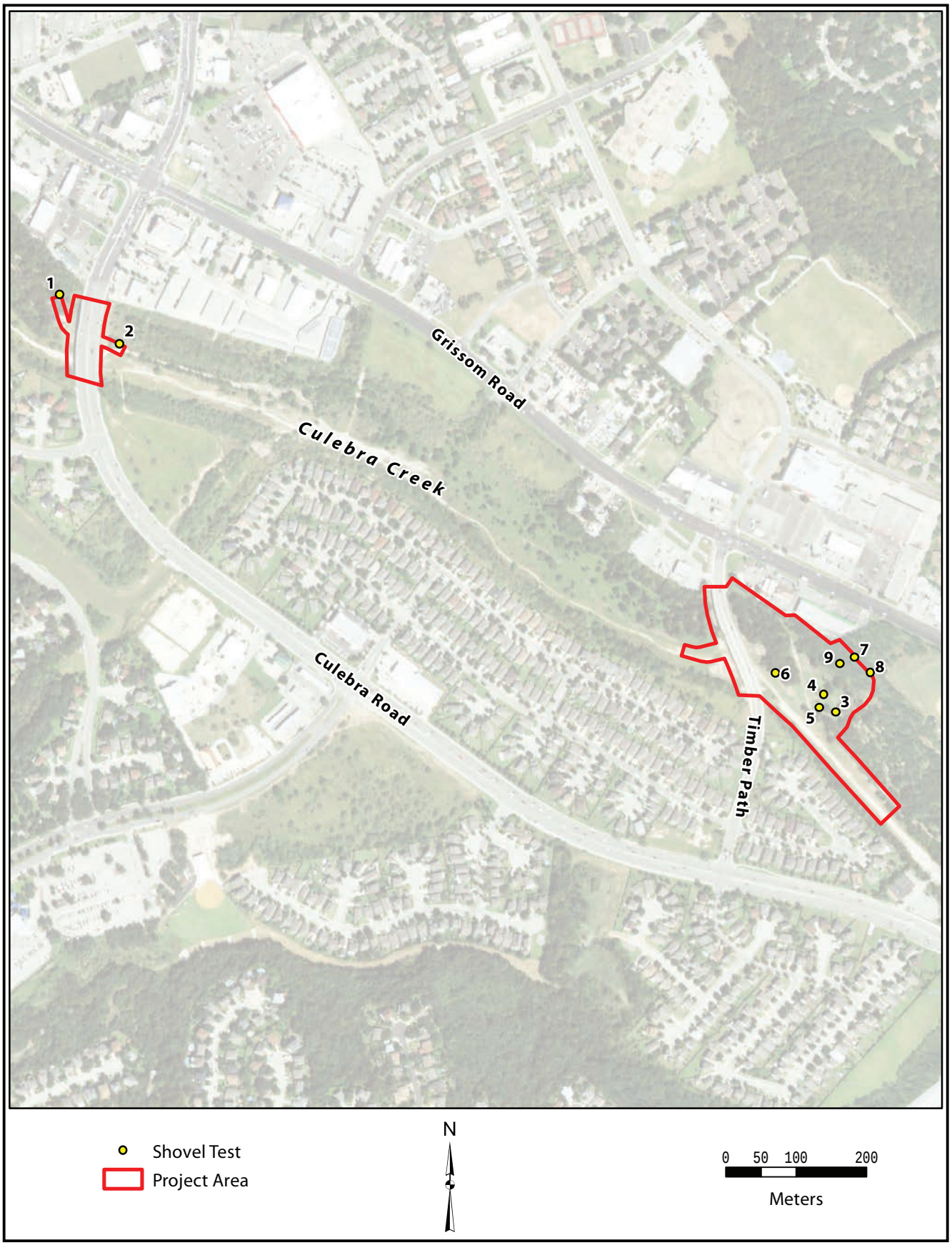

Figure 2. Modern aerial photograph of the project area showing the APE and shovel test locations. The Culebra Road survey area is on the west, and the Timber Path survey area is on the east.

brown, gravelly silty clay with some carbonate flecks. The sizes of the angular to subangular limestone gravels were variable.

Shovel Test 2 was on a vegetated gravel bar along the north edge of the proposed pilot channel east of the bridge. This 15-cm-deep test revealed 3–4 cm of grayish brown clay loam and roots above well-consolidated yellowish brown silty and sandy clay with abundant rounded gravels and carbonate flecks. The existing channel cut roughly 5 m south of the test shows a heterogeneous deposit of fine to coarse gravels (up to 45 cm across) with little intervening sediment that is at least 1 m thick.

Shovel Tests 3–6 were in relatively flat areas on the broad channel floor, between abandoned road segments and the current channel cut. Surfaces at these four tests were covered with a dense mat of grasses and forbs. Shovel Tests 3–5 were within 20 to 30 m of each other on what appeared to be a wide bench flanked by the bedrock-floored channel to the east and northeast. Shovel Test 3 revealed 7 cm of loose sandy loam with a few gravels and some asphalt shingle fragments above tightly packed gravels interspersed with loam and silty clay; it extended to a depth of 13 cm. Shovel Test 4 exposed 12 cm of dark brown clay loam and clay with fine lenses of medium-grained sand over 18 cm of dark brown clay mottled with pale gray silt with few gravels. Beneath this was 30 cm of dry, strongly granular, dark brown clay with scattered fragments of indurated limestone that increased in frequency with depth. The test ended at limestone bedrock at 60 cm. Partially buried segments of rubber tubing were observed in an area of softer surface sediments about 5 m south of this test. Shovel Test 5 was about 10 m east of an abandoned road segment and excavated to a depth of only 20 cm because it revealed dry brown loam and sandy loam mixed with high-density small gravels and some asphalt fragments. Shovel Test 6 was on a flat area composed of fine-grained sediments and surface gravel deposits south of a braided channel segment. The test revealed 6 cm of moderately consolidated, granular, silty clay over 9 cm of dark brown, granular, silty clay and clay with few gravels and *Rabdotus* shells. Sediment in the remainder of the test (to a depth of 45 cm) was very dark brown clay with a few small gravels and scattered carbonate flecks.

Shovel Tests 7–9 were north of the existing stream channel. Shovel Tests 7 and 8 were on top of the north bank on the leading terrace edge. Shovel Test 9 was on a bench below a 25-m-long by 15-m-wide mechanical cut in the bank wall. These tests ranged from 25 to 28 cm in depth. Shovel Test 7 revealed 25 cm of strongly granular, reddish brown silt loam with abundant fine gravels and some snail shells above tightly packed calcareous gravels interspersed with silty clay. Shovel Test 8 exposed strongly granular to blocky, dark brown silty clay with a few fine gravels to a depth of 25 cm. Shovel Test 9 revealed 22 cm of strongly granular, dark brown silty clay loam and silty clay with a few fine gravels above well-consolidated brown clay with carbonate flecks.

Visible remains of the original Culebra Road stream crossing east of Timber Path include a 400-ft-long northwest-southeast paved segment on the channel floor and a cut in the north terrace wall. The paved segment is 18 ft wide and composed

of at least two layers of weathered asphalt and fine-grained aggregate that has the appearance of a modern concrete sidewalk. The paved portion is covered in places by water-laid gravels, and the exposed segment ends at gravel berms and large pieces of limestone. The cut in the bank wall is also covered with gravel, larger rocks, and concrete rubble. A 1959 topographic map suggests the low road segment bridged the creek with a culvert, but no indication of this was observed during the survey, which suggests it was buried by post-abandonment stream flow (NETR Online 2017). A later crossing was constructed roughly 275 ft upstream from the first one between 1955 and 1963. The wider roadway tied into an expanded Culebra Road alignment south of the creek. This road segment was in use until Timber Path was constructed in about 2010 (NETR Online 2017). Timber Path follows the mid-twentieth-century alignment across and north of the creek, and a 935-ft-long segment of the old roadway and wide roadbed extends southeast from the present bridge to the south end of the APE. The old roadbed runs between the graded south terrace wall and an existing channel cut. The top of the roadbed is about 90 ft wide, and it stands 3–4 m above the floor of the adjacent channel at the southeast end of the APE. The sloped surface above the stream channel is composed of artificial fill, dumped asphalt, concrete fragments, and large pieces of limestone. The former roadway now consists primarily of limestone gravels and calcareous road base with scattered remnants of in situ asphalt. Although both of the abandoned road segments are of historic age, neither feature was recorded as an archeological site due to extensive post-abandonment disturbance and limited archeological potential with respect to area history.

RECOMMENDATIONS

Review of aerial photographs indicates that the Culebra Creek channel was cut and graded across the west segment of APE prior to construction of the Culebra Creek bridge in the 1980s. The east APE segment was impacted by road construction as early as the nineteenth century, and the existing bridge corridor and parts of the APE below it were subject to road construction disturbance in the mid twentieth century and again in about 2010 (NETR Online 2017). The south channel or terrace wall in the APE below Timber Path has been cut and graded, and the north channel wall has been impacted by mechanical excavation and retail construction. Subsurface utilities cross the southern portion of the APE, and overhead utility lines cross segments of the east side of the project area. Proposed modifications to the existing bridge corridors will be within the limits of previous construction disturbance, and the proposed pilot channels are in areas impacted by natural and artificial channelization, channel meander and scouring, and previous road construction. Proposed bank or terrace wall modifications east of Timber Path will be relegated to previously cut and graded wall segments or eroded surfaces that have been extensively disturbed by previous mechanical earthmoving activity and nonresidential construction.

Survey identified gravel deposits at the surface across much of the APE, and shovel tests revealed shallow surface soils or near-surface gravel deposits in the tested areas. Modern trash protrudes from the surface in some areas and

was identified in the upper portions of some of the shovel tests. No artifacts or archeological sites were identified within the APE during this survey. The extensively disturbed early- and mid-twentieth-century road segments in the APE were not recorded as archeological sites because they have no potential to impart archeological information. Surface observations and the shovel test profiles indicate that the APE does not include surface soils of sufficient depth to contain buried archeological sites. According to this finding, the APE has very little potential for intact archeological deposits that would meet eligibility criteria for listing in the National Register of Historic Places or designation as a State Antiquities Landmark. Hence, Prewitt and Associates, Inc., recommends that the proposed project be allowed to proceed without additional archeological investigations.

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