Mitigation/Excavations of Site 41WM1398 for the Corridor C/State Highway 29 Bypass Project Williamson County, Texas: Texas Antiquities Permit Research Design

Principal Investigator: Katherine Turner-Pearson, M.A., RPA

Atkins Global, on behalf of Williamson County, requests Texas Historical Commission (THC) coordination and Antiquities Code of Texas Permitting for Archaeological Mitigation/ Excavation activities at the Mankins Branch archaeological site (41WM1398) in Georgetown, Williamson County, Texas. The site is located 637 meters (m) off County Road 106 (**Figure 1**).

Background

The Mankins Branch site (41WM1398) was discovered in 2019 during a linear survey in anticipation of the Corridor C/State Highway (SH) 29 Bypass Project in Williamson County, Texas. The Williamson County sponsored project consists of a new controlled access facility between Sam Houston Avenue on the west and the Texas Department of Transportation's (TxDOT) future SH 29 facility on the east in Williamson County. Archaeological investigations started with a survey under the Antiquities Code of Texas as Williamson County is a political subdivision of the state and under Section 106 of the National Historic Preservation Act (Texas Antiquities Permit [TAP] #8519) in anticipation of a United States Army Corps of Engineers (USACE) permit. Survey investigations performed by Atkins in February 2019 encountered previously unrecorded archaeological site 41WM1398 (Mankins Branch site). Following survey investigations, Atkins recommended that 41WM1398 had an "undetermined" eligibility for inclusion in the National Register of Historic Places (NRHP), and the THC concurred.

Under contract by Williamson County, Atkins conducted NRHP Eligibility Testing on Site 41WM1398 between July 8, 2019 and May 26, 2020 under TAP No. 8960. Laura I. Acuña, M.A. served as the Principal Investigator for the first half of the project (Testing – Part A) and transferred the permit to Registered Professional Archaeologist (RPA), Katherine Turner-Pearson, M.A., RPA #16193 who served as Principal Investigator for the second half of the project (Testing – Part B). The area of potential effect (APE) during the survey at the Mankins Branch site (41WM1398) was divided into a "deep impact area" and a "shallow impact area" based on the project designs at the time of the survey. The deep impact APE consisted of the drill shaft impact area measuring approximately 40m (131 feet [ft]) x 6 m (20 ft), or 183.9 square meters (m^2) (1,979.5 square ft [sq ft]), and extending to bedrock. The shallow impact area was defined as the remainder of planned right-of-way (ROW), with a maximum width of 56.39 m (185 ft), a length of 126.92 m (416.41 ft), and a disturbance of nominal depth, as the area will be covered with additional sediments and gravel to raise the elevation. Both impact areas were surveyed by shovel test excavations during the initial survey investigations.

As noted above, the Testing Phase investigations focused on the proposed drill shaft area for bridge supports within site 41WM1398, approximately 40 m (131 ft) x 6 m (20 ft), or 183.9 m^2 (1,979.5 sq ft), and extended the excavations only to 1.74 m (5.7 ft) below surface due to the reach of the backhoe and discovered deeply buried burned rock features (excavations not to bedrock) (**Figure 2**) Based on the findings, archaeologists determined that site 41WM1398 is a multi-component, prehistoric site with deep intact deposits and isolable cultural horizons dating from the Paleoamerican to the Transitional-Late Archaic periods (ca. 12,000 years before present (BP) – ca. 1200 BP) (Turner-Pearson et. al. 2021). The site was recommended eligible for

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Figure 1. Location of Mankins Branch Archaeological Site (41WM1398)

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Figure 2. Site Map of 41WM1398; Location of Test Trenches, Shovel Tests, and Excavation Boundaries.

the NRHP and as a State Antiquities Landmark (SAL), and since the site will be destroyed by imminent highway construction,researchers recommended, and the THC agreed, to mitigation of the site in advance of that construction. Since the Testing Phase, the USACE has determined their oversight is not necessary for this project, and the mitigation will proceed under the Antiquities Code of Texas with THC jurisdiction.

During the testing investigations, Atkins archaeologists opened two large trenches in the deep impact area for the Corridor C Highway project within the known boundaries of the Mankins Branch site (41WM1398) within the proposed project's ROW and discovered the aforementioned three isolable cultural horizons dating from the Early Paleoamerican to the Transitional Archaic periods (**Figure 2**).

Archaeologists identified five burned rock features that, while disturbed in the upper horizon, remained intact and undisturbed in the older, deeper horizons (**Figure 3**). The upper cultural horizon (Horizon 1) contained a large, burned rock midden, greatly disturbed by previous non-professional, random mechanical excavations. The disturbed feature in this horizon (Feature 1) produced an Accelerator Mass Spectrometry (AMS) radiocarbon standard date of 2580 ±- 30 BP (calibrated [cal]) AMS radiocarbon date 2763 cal BP–2699 cal BP). The two deeper and much older cultural horizons (Horizons 2 and 3), and associated features were undisturbed and *in sitú* (**Figure 3**). The site extended across the limits of the deep impact drill shaft area. Because of the disturbance to the upper burned rock midden (Feature 1) in Horizon 1, the crew focused on the intact lower features within the two deeper cultural horizons (Horizons 2 and 3). While no radiometric date was ascertained for either of the two features in Horizon 2 (Features A and B), the lowest horizon (Horizon 3) containing Features 4 and C yielded AMS radiocarbon standard dates of between 8100 ±-30 BP – 9740-9187 ±-30 BP (AMS cal radiocarbon dates between 8992 cal BP – 11,231 cal BP) (**Figure 3**). This puts the lowest horizon squarely in the Paleoamerican period. As Paleoamerican sites are relatively rare in Central Texas, the Mankins Branch site (41WM1398) is hugely important to the collective knowledge of the prehistory of Central Texas.

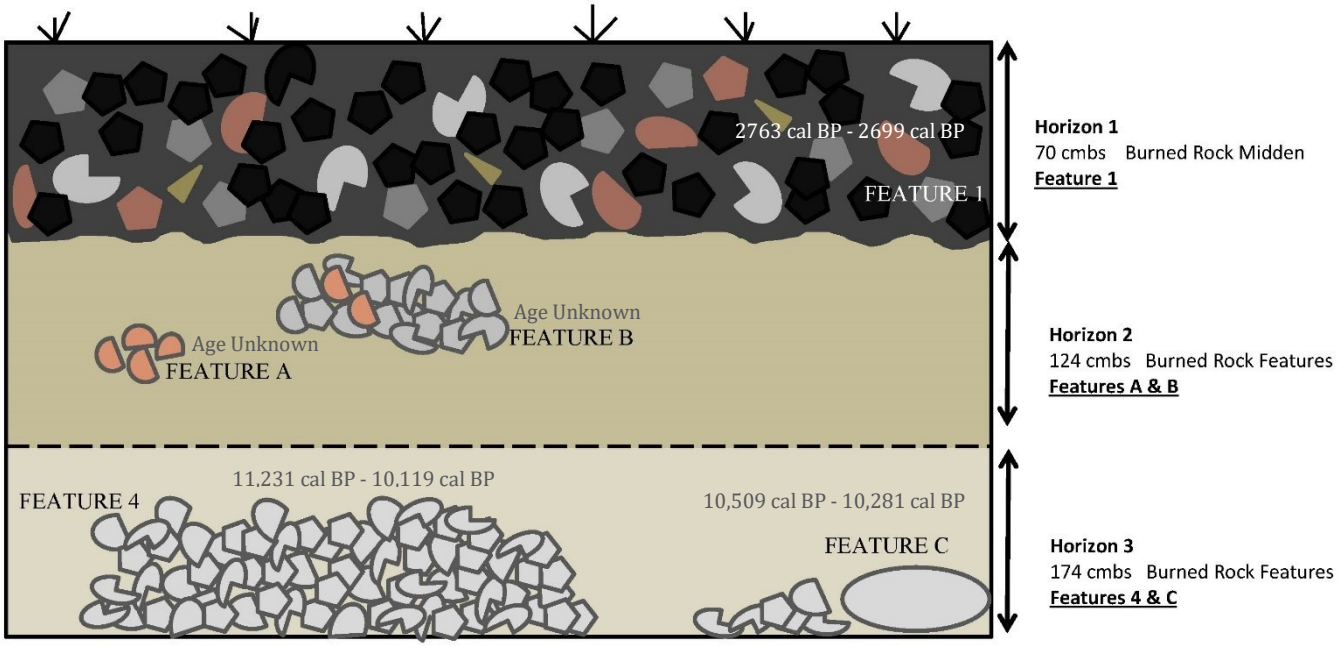

Figure 3. Diagram of Features at Mankins Branch Site (41WM1398).

Based on the findings of the testing excavations, Atkins' Principal Investigator, Turner-Pearson recommended that the Mankins Branch site (41WM1398) be determined eligible for listing in the NRHP and as an SAL. Because the planned construction of the Williamson County Corridor C Highway Project will result in destruction of the Mankins Branch site within the project's boundaries, Atkins further

recommended data recovery excavations to mitigate the adverse effects to the site prior to project construction in a Report of Investigations submitted to the THC on April 1, 2021. The THC concurred with these findings on April 29, 2021 (THC Tracking #202107636). This Research Design is intended to address plans for that mitigation.

USGS Quadrangle References

The project lies within the U.S. Geological Survey 7.5-Minute quadrangle map of TEX, Weir [3097-314] (United States Geological Survey [USGS] 2020) (**Figure 1**).

Geology and Physiography

The Mankins Branch site (41WM1398) sits on the edge of two geologic formations, Austin Chalk and Fluviatile Terrace Deposits (USGS 2020). The upper slope of the site is Austin Chalk, located on the Austin Sheet. It is Cretaceous in age and part of the Gulfian series and the Austin group. It consists of both chalk and marl but is predominantly chalk. It is microgranular calcite with minor foraminifera tests and inoceramid prisms. It averages about 85 percent calcium carbonates, and soils from the formation are highly reactive. It forms grayish-white to white ledges alternating with marl that are observable along cut-banks of the nearby stream and contains pyrite nodules with outcrops of chert (USGS 2020).

The geologic formation on the terrace immediately above Mankins Branch, within the area of archaeological site 41WM1398, consists of Fluviatile Terrace Deposits (USGS 2020). These deposits are Quaternary in age and part of the Pleistocene epoch. These terrace deposits are located along streams and consist of three or more levels which may correspond to coastal Pleistocene units consisting of gravel, sand, silt, and clays in various proportions, with the gravel more dominant in the older, higher terraces. Along the nearby San Gabriel River, gravels dominate, while siliceous coarse deposits dominate along the Colorado River. Other lesser streams vary, dependent on their watershed. The deposits contain limestone, gray chert, quartz, and various igneous and metamorphic rocks from the Llano region, and dolomite, limestone, sand, quartz, and gray "Edwards Chert" from the Edwards Plateau (USGS 2020).

Climate and Hydrology

The prevailing local climate in Williamson County is humid subtropical and is normally hot in the summer (Werchan and Coker 1983). Winters are generally mild with occasional polar air intrusions of short duration and below-freezing temperatures occurring on an average of less than 25 days each year. Temperatures in the area range from an average high of 95° Fahrenheit (F) (35° Celsius [C]) in summer to an average low of 38°F (3.3°C) in winter. The average annual precipitation is approximately 87 centimeters (cm) (35 inches) and fairly evenly distributed throughout the year.

The Mankins Branch Site (41WM1398) sits downslope of a grass-covered limestone hill on a terrace approximately 3.5 m (12 ft) above the Mankins Branch stream. The drainage at the site is the adjacent Mankins Branch, and the main watershed is the nearby San Gabriel River. Watershed from an adjacent hill passes through the archaeological site on its way to the stream. Mankins Branch meanders northward away from the site and then curves to the east-southeast where it meets the San Gabriel River 1.24 kilometers (km) (0.77 miles) away. The greater floodplain of the San Gabriel River is between the confluence of Mankins Branch and the San Gabriel River.

Soils at the APE

The terrace where the site rests consists of alluvium from the meandering stream below, and colluvium from the deflating, adjacent hill slope to the south. The TxDOT

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Figure 4. Soils Mapped at 41WM1398 (*National Cooperative Soil Survey Map*, National Cooperative Soil Survey, National Resources Conservation Services 2021)

Predictive Archeological Liability Map indicates the soils within the APE have a medium to high probability of containing deeply buried archaeological sites (TxDOT 2021). The soils at the archaeological site are (SvB) Sunev silty clay loam, 1% to 3% slopes; (OkA) Oakalla silty clay loam, 0% to 2% slopes, occasionally flooded; and (OkA) Oakalla silty clay loam, 0% to 2% slopes, frequently flooded (**Figure 4**) (National Cooperative Soil Survey [NCSS] 2021; United States Department of Agriculture, Natural Resources Conservation Services [USDA, NRCS] 2020).

(SvB) Sunev silty clay loam soils are usually located on the risers of stream terraces. They are loamy alluvium of Quaternary age derived from mixed sources through alluvial processes. These deep, well drained soils are in excess of 203 cm (80 inches) thick and considered prime farmland (**Figure 4**). A typical profile is:

Soil Horizon 1: 0 – 46 cm (0 - 18 inch) silty clay loam

Soil Horizon 2 : 46 – 132 cm (18 - 52 inch) silty clay loam

Soil Horizon 3: 132 – 152 cm (52 - 60 inch) silty clay loam (NCSS 2021; USDA, NRCS 2020).

(OkA) Oakalla silty clay loam soils are typically located on the treads of floodplains and the flat areas of floodplains. These weak soils are not considered good farmland. They are formed by loamy alluvium derived from limestone (**Figure 4**). A typical profile is:

Soil Horizon 1 (Ap): 0 – 20 cm (0 - 8 inch) silty clay loam

Soil Horizon 2 (Ak): 20 – 58 cm (8 - 23 inch) silty clay loam

Soil Horizon 3 (Bk1): 58 – 135 cm (23 - 53 inch) silty clay loam

Soil Horizon 4 (Bk2): 135 – 203 cm (53 - 80 inch) silty clay loam (NCSS 2021; USDA, NRCS 2020).

Flora and Fauna

The Mankins Branch site (41WM1398) lies along the edge of the Blackland Prairie on the border with the Southern Post Oak Savannah ecoregions of Texas (Sorrow 2019). The Blackland Prairie ecoregion is a narrow belt of relatively flat terrain that spans approximately 6.1 million hectares and parallels the Balcones Escarpment in a northeast-southwest orientation, from the Red River Valley and the Oklahoma border, down into the South Texas Plains south of San Antonio (Texas Parks and Wildlife [TPWD] 2019).The Blackland Prairie forms an ecotone (or interface of ecological zones) between the Edwards Plateau to the west and the Post Oak Savannah to the east. The Mankins Branch site (41WM1398) is situated in a portion of the prairie that forms a natural corridor between the Lampasas Cut Plain to the northwest and the Gulf Coastal Plain to the southeast, both less than 16 km (10 miles) distance. Topographic relief north and east of the site toward Hutto is practically nonexistent, although low, rolling hills are found to the south toward Pflugerville and to the west toward Round Rock. Karstic sinks, caves, and rock shelters commonly occur to the west of Interstate Highway 35 (IH 35), while occasional springs and seeps can be found in the prairie margins to the east of the site.

The Post Oak Savannah is also referred to as the Savannah Grassland Region of Texas (TPWD 2019). The original plant community associated with the region was a savannah dominated by native grasses and forbs with scattered clumps of primarily Post Oak trees. Historically, the forested areas were generally restricted to bottomlands along major rivers and creeks, or in areas protected from fire. Soils within the area are unique, with sands and sandy loams found on upland sites and clay, or clay loams associated with

bottomlands. A dense, clay pan that is almost impervious to water underlies all the soil types within the region at depths of only a few feet (TPWD 2019). The changes to the land that occurred over the last 100+ years have dramatically altered the flora and fauna of the region. The once diverse wildlife communities that occurred on the prairies and savannahs have been reduced dramatically and continue to decline. Today the Post Oak Savannah has been converted into vast acreages of improved pastures consisting of Bermuda grass (*Cynodon dactylon*) and/or Bahiagrass (*Paspalum notatum*) (TPWD 2019). The archaeological site location, offering multiple ecoregions within walking distance, created a region rich in diverse flora and fauna for exploitation among the ancient inhabitants of the area.

Flora

As noted above, the project area is located where the Savannah Prairie and the Blackland Prairie Ecoregions meet (Sorrow 2019). This land was once dominated by Indiangrass (*Sorghast nutans*), little bluestem (*Schizachyrium scoparium*), and big bluestem (*Andropogon gerardii*), but today, the area is dominated by farm and ranch fields and pastures that grow grain sorghum (*Sorghum*), corn (*Zea mays*), wheat (*Triticum*), and hay crops. The San Gabriel River, Mankins Branch, and other drainages are wooded with bur oak (*Quercus macrocarpa*), Shumard oak (*Quercus shumardii*), sugar hackberry (*Celtis laevigata*), elm (*Ulmus),* ash (*Fraxinus*), eastern cottonwood (*Populus deltoides*), and pecan (*Carya illinoinensis*). The dominant grasses of the pasture lands containing clayey vertisol soils are eastern gamagrass (*Tripsacum dactyloides*) and switchgrass (*Panicum virgatum*) (TPWD 2019). Native grasses such as little bluestem, Texas wintergrass (*Nasella leucotricha*), Indiangrass, and switchgrass (*Panicum virgatum*) still survive in the county, but non-native grasses such as Coastal Bermuda (*Cynodon dactylon*) have taken over large portions of the county due to farming and over grazing by cattle (TPWD 2019). The project area is currently used as grassland for cattle production.

The Blackland Prairie is part of a tallgrass prairie continuum that stretches from Manitoba to the Texas Coast. The natural vegetation of the region is dominated by tallgrass prairie on uplands, deciduous bottomlands, and woodland forests along rivers and creeks (Eidson and Smeins 2019). This diversity is attributable to the ecoregion's variety of soil orders, and their variation in texture and soil pH. Little bluestem and Indiangrass are frequently dominants on Blackland Prairie alfisols and vertisols. Big bluestem is of variable importance on vertisols and is frequently dominant on Blackland Prairie mollisols. Gamagrasss/switchgrass prairies are associated with bottomland sites throughout the region and are also found on upland sites of the northern main belt vertisols where they are especially associated with gilgai microtopography. Silveus' drop seed/Mead's sedge (*Sporobolus silveanus/Carex meadii*) prairies are found over low pH soils of the northern main belt. Little bluestem, brownseed paspalum (*Paspalum plicatulum*) prairie is associated with Fayette Prairie alfisols (Eidson and Smeins 2019).

Trees of the Blackland Prairie include cedar elm (*Ulmus crassifolia*), Texas ash (*Fraxinus texensis*), post oak (*Quercus stellate*), cottonwood (*Populus*), pecan (*Carya illinoinensis*), and willow (*Salix*); while shrubs include coralberry (*Ardisia crenata*), skunkbush sumac (*Rhus trilobata*), elbowbush/desert olive (*Forestiera pubescens*), and Mexican buckeye (*Ungnadia speciose*) (TPWD 2019).

Fauna

The Mankins Branch site (41WM1398) lies near the western edge of the Texan biotic province as described by Blair (1950). This transitional region is recognized as a broad eco-tone of grasslands and savannahs situated between the forests of the Austroriparian province of eastern Texas and the Kansan prairies or Balconian forests of northern and central Texas. The vertebrate fauna of the Texan biotic province is therefore represented by a mixture of species from these three provinces as well as the Tamaulipan brushlands to the south. The area fauna periodically used the grasslands and their streams depending on

prevailing climatic regimes. Archaeological evidence suggests that bison were present in all these biotic provinces during the Early Paleoamerican period as late as circa 9000 BP (Collins 1998a), and then became scarce until approximately 650 BP (Johnson and Goode 1995), after which they became more prevalent moving into the early nineteenth century.

Currently, the fauna in Williamson County includes a plethora of reptiles, including western rat snake (*Pantherophis obsoletus*), common slider turtle (*Trachemys scripta*), gopher snake (*Pituophis catenifer*), Mediterranean house gecko (*Hemidactylus turcicus*), Texas spiny lizard (*Sceloporus olivaceus*), checkered garter snake (*Thamnophis marcianus*), speckled kingsnake (*Lampropeltis holbrooki*), western diamondback rattlesnake (*Crotalus atrox*), North American racer (*Coluber constrictor*), ringneck snake (*Diadophis punctatus*), western ribbon snake (*Thamnophis proximus*), plain-bellied watersnake (*Nerodia erythrogaster*), coachwhip (*Masticophis flagellum*), rough earth snake (*Haldea striatula*), eastern hog-nosed snake (*Heterodon platirhinos*), six-lined racerunner (*Aspidoscelis sexlineata*), Great Plains rat snake (*Pantherophis emoryi*), DeKay's brown snake (*Storeria dekayi*), copperhead (*Agkistrodon contortrix*), cottonmouth (*Agkistrodon piscivorus*), little brown skink (*Scincella lateralis*), spiny softshell turtle (*Apalone spinifera*), rough greensnake (*Opheodrys aestivus*), and Texas horned lizard (*Phrynosoma cornutum*) (Ueda and Loarie 2019).

Mammals in Williamson County include the common raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), white-tailed deer (*Odocoileus virginianus*), fox squirrel (*Sciurus niger*), coyote (*Canis latrans*), eastern cottontail (*Sylvilagus floridanus*), nine-banded armadillo (*Dasypus novemcinctus*), North American porcupine (*Erethizon dorsatum*), eastern mole (*Scalopus aquaticus*), eastern gray squirrel (*Sciurus carolinensis*), red fox (*Vulpes vulpes*), American beaver (*Castor canadensis*), desert cottontail (*Sylvilagus audubonii*), gray fox (*Urocyon cinereoargenteus*), black-tailed jackrabbit (*Lepus californicus*), pronghorn (*Antilocapra americana*), collared peccary (*Pecari tajacu*), house mouse (*Mus musculus*), mountain lion (*Puma concolor*), black-tailed prairie dog (*Cynomys ludovicianus*), deer mouse (*Peromyscus maniculatus*), big brown bat (*Eptesicus fuscus*), American badger (*Taxidea taxus*), Mexican free-tailed bat (T*adarida brasiliensis*), ringtail (*Bassariscus astutus*), long-tailed weasel (*Mustela frenata*), and eastern red bat (*Lasiurus borealis*) (Ueda and Loarie 2019).

A wide variety of birds inhabit the county's woodlands and prairies, including eastern phoebe (*Sayornis phoebe*), great blue heron (*Ardea herodias*), red-tailed hawk (*Buteo jamaicensis*), ring-billed gull (*Larus delawarensis*), northern mockingbird (*Mimus polyglottos*), gadwall (*Mareca strepera*), American wigeon (*Mareca americana*), spotted towhee (*Pipilo maculatus*), ring-necked duck (*Aythya collaris*), northern cardinal (*Cardinalis cardinalis*), house finch (*Haemorhous mexicanus*), tufted titmouse (*Baeolophus bicolor*), mourning dove (*Zenaida macroura*), turkey vulture (*Cathartes aura*), double-crested cormorant (*Phalacrocorax auritus*), American coot (*Fulica americana*), great-tailed grackle (*Quiscalus mexicanus*), killdeer (*Charadrius vociferus*), white-crowned sparrow (*Zonotrichia leucophrys*), red- shouldered hawk (*Buteo lineatus*), belted kingfisher (*Megaceryle alcyon*), greater yellowlegs (*Tringa melanoleuca*), northern pintail (*Anas acuta*), and greater roadrunner (*Geococcyx californianus*) (Ueda and Loarie 2019).

Cultural Context

The project area is located within the Central Texas archaeological region in western Williamson County (Perttula 2004). The archaeological record in Williamson County spans the entire prehistoric period beginning with the Paleoamerican. Cultural sites recorded in the county consist of campsites with intact cultural components from the Early Paleoamerican period to the Late Prehistoric, as well as historic-age archaeological sites and farmsteads that contribute to the overall prehistoric and historic record of the region. The following context outlines the cultural periods within Williamson County, taken primarily from

the synthesis provided by Collins (2004), supplemented with more recent investigations completed within Williamson County; specifically, along the San Gabriel River (Rogers and Russell 2008).

Prehistoric Context

Paleoamerican Period (ca. 12,000 BP – 8000 BP)

The Early Paleoamerican period is characterized by the presence of Folsom and Clovis tools, and is the earliest cultural period in Central Texas, dating between ca.12,000–8000 BP, with Early Paleoamerican from ca. 12,000–10,000 BP and Late Paleoamerican during the Early Holocene period of ca. 10,000–8000 BP (Bousman et al. 2004). The term Early Paleoamerican is given to materials often associated with extinct megafauna. Clovis and, later, Folsom toolkits are associated with this cultural horizon. Site types of this time include kill sites, quarries, camps, and burials. Well-made artifacts, often of exotic materials, include prismatic blades and bifaces. Engraved stone, ivory, and bone have also been found at these sites. Clovis people appear to have led an adaptive lifestyle at a time when climatic conditions were going from xeric to mesic (Collins 2004, 2005). They possessed the capability of hunting large game but did not exclusively rely on it. They traveled great distances and occupied diverse environments. Caches of artifacts suggest they returned and reused campsites. Folsom people appear to have been specialized bison hunters, and their toolkit contains thin bifaces, Folsom points, and small end scrapers. The climatological evidence suggests that relatively mesic conditions existed in Central Texas during Folsom time. Folsom period sites are usually found in grassland environments (Collins 1998b:62). Plainview is a cultural manifestation that is currently problematical. Its chronological position is uncertain, and the name is often applied to unfluted points that lack the flaking patterns and thinness found at the type site (Bousman et al. 2004; Collins 2004). A reclassification of unfluted lanceolate points using cluster analysis resulted in two broad morphological categories: contracting stem forms (Angostura, Lubbock, Thrall, Midland) and parallel stem forms (Plainview, St. Mary's Hall, Scottsbluff), with a third category consisting of points characterized by deep basal concavities (atypical St. Mary's Hall, Golondrina, Barber, Dalton). Only four different stemmed points (Wilson, Berclair, San Patrice, and Big Sandy) have been discovered at Paleoamerican sites in Texas in the late twentieth century (Bousman et al. 2004).

Along the San Gabriel River, multi-component sites (41WM133, 41WM165, 41WM267, 41WM382, and 41WM1101) contain evidence of Paleoamerican diagnostics but are surface finds within deflated areas (Rogers and Russell 2008). Two sites 41WM35 and 41WM419, occur on the terraces of the San Gabriel River with buried cultural deposits; however, the Paleoamerican component could not be stratigraphically isolated with certainty (Rogers and Russell 2008).

The Wilson-Leonard site (41WM235) is one of the few sites with a complete stratigraphic sequence with a classic lanceolate Paleoamerican occupation and is located approximately 19.7 km (12.3 miles) southwest of the current project area along Brushy Creek (Goldberg and Holliday 1998; Bousman et al. 2004). The Early Paleoamerican occupation is buried in fluvial deposits dating to between 12,000 and 10,600 BP. Three components were identified in these deposits: an early one attributable to a Clovis complex; an intermediate one known as the Bone Bed component that aligns with Folsom, Plainview, and Goshen complexes; and a poorly identified late component. Activities associated with the Early Paleoamerican subperiod at the site are limited to the slaughter of bison and the knapping of chert, although the assemblages demonstrate diversity in material culture and subsistence behavior (Collins 1998b:159). Late Paleoamerican remains at Wilson-Leonard were more extensive and included the flexed burial of a young adult female with a shark tooth pendant and ground stone tools. Features from the Late Paleoamerican occupation of the site are restricted to small clusters or rings of burned rock, pits of unknown function, and associated scatters of stone tools and debitage, with the notable exception of the burial. Among the types of tools present were projectile points (Golondrina-Barber, Wilson, St. Mary's Hall, Scottsbluff, San

Patrice, and Angostura), burins, perforators, bifaces, unifaces, hammerstones, Waco sinkers, and Clear Fork gouges. Faunal remains found include bison, deer, rabbits, hares, turtles, fish, and snakes. The Late Paleoamerican occupations, which were divided into two components, occurred between 9500 and 8400 B.P (Bousman et al. 2004; Collins 1998b).

Archaic Period (ca 8000 BP – 1200 BP)

The Archaic period is subdivided into Early Archaic (ca. 8800–6000 BP), Middle Archaic (ca. 6000–4000 BP), and Late Archaic (ca. 4000–1200 BP) in recent chronologies (Collins 2004). However, Bousman and Oksanen (2012) suggest the 2,600-year period beginning at the end of the Pleistocene (10,000 BP, or 11,650 cal BP) for Late Paleoamerican groups to the Early Holocene and beginning of the Early Archaic (8,000 BP, or ca. 9,050 cal BP) be identified as the Proto archaic period. Although Bousman and Oksanen (2012) provide compelling arguments and analysis of this transitional period between the Paleoamerican and Archaic, they confirm that additional excavations of well preserved, unmixed components are needed to flesh out the chronology, subsistence, and settlement data for the period. Thus, archeologists currently define the cultural characteristics of the groups within this relatively short time span, within the Late Paleoamerican period, or they split it with the Early Archaic (Bousman and Oksanen 2012). For purposes of this context, the Archaic chronology provided by Collins (2004), adapted from Johnson and Goode (1994) will be utilized.

The Early Archaic (8800–6000 BP) in Central Texas was marked by a change from severely xeric to mesic to mildly xeric conditions (Collins 2004, 2005; Johnson and Goode 1995). Most Early Archaic sites are open campsites, and they seem to be concentrated in better-watered areas on the eastern and southern edges of the Edwards Plateau (Johnson 1991). In addition to dart points, woodworking tools (Clear Fork and Guadalupe bifaces), grinding stones and hammerstones were found at these encampments. Bulb cooking in earth ovens and large scatters of burned rocks that represent antecedents to the later burned rock middens make their appearance during the Early Archaic and dominate the Middle Archaic period (Collins 2004). The use of large burned rock ovens is evident at the Gault site (41WM9 and 41BL323) and the Wilson-Leonard site indicating their use across Central Texas at the onset of the Early Archaic (Bousman and Oksanen 2012).

The investigations within the SH 130 study corridor encountered three single-component, Early Archaic campsites (41WM432, 41WM558, and 41WM596) at the crossing of the Middle and South Forks of the San Gabriel River approximately 6.24 km (3.88 miles) west of the current project area (Rogers and Russell 2008). Diagnostic dart points found at these sites include Hoxie, Gower, Uvalde, and Early Barbed. A burned rock midden was present at site 41WM432. An additional 13 multicomponent sites located within the study corridor contain Early Archaic materials (Rogers and Russell 2008). Other sites with evidence of the Early Archaic in Williamson County include the Tombstone Bluff site (41WM165), the Loeve site (41WM133), and the John Ischy site (41WM49), also located along the San Gabriel River (Prewitt 1981, 1982; Sorrow 1969). The Tombstone Bluff site (41WM165) is located a few miles east of the study corridor. This site, although deflated, yielded evidence of a lengthy occupation, with the primary activities including hunting and the manufacturing of stone tools, with the latter being the impetus for the site's existence, as lag gravels were thought to have attracted people to the location (Prewitt 1982). The early component at the Loeve site (41WM133) yielded an Angostura dart point, scrapers, a graver, and other bifacial implements. Features associated with these artifacts included large and medium-sized basin hearths and a burned clay/charcoal pit. The presence of mussel shells testifies to the consumption of this foodstuff (Prewitt 1982). The John Ischy site (41WM49) along the North Fork of the San Gabriel River in the uplands (Lampasas Cut Plain) to the west, contained Baird and Taylor dart points within Period I of the site which equates with the Early Archaic period (Prewitt 1981; Sorrow 1969).

The Middle Archaic (6000–4000 BP) can be subdivided into three style intervals: Bell-Andice-Calf Creek, Taylor, and Nolan-Travis (Collins 2004). A shift in lithic technology is apparent with the emergence of Bell-Andice-Calf Creek, where triangular-shaped bifaces were made by removing long, thin flakes. These artifacts are associated with bison hunters who may have moved into the area from the southern plains (Johnson and Goode 1995:86). Climatic conditions appear to have been somewhat mesic at the beginning of the Middle Archaic. By the time Taylor and Nolan points come into the archaeological record, extremely xeric conditions had returned, and bison were absent. Burned rock middens debuted during this dry period and were particularly abundant on the eastern edge of the Edwards Plateau. Johnson and Goode (1995:87–88) speculate that the middens were used to process sotol and other xerophytes. More recent studies suggest the burned rock middens were also used to process and cook geophytes, inulin-rich resources, which expanded the diet breadth of groups during dryer periods (Acuña 2006; Bousman and Oksanen 2012; Dering 2007; Thoms 2008, 2009).

Three single-component Middle Archaic sites (41WM54, 41WM962, and 41WM1084) were recorded within the SH 130 study corridor at the crossing of the North and Middle Forks of the San Gabriel River (Rogers and Russell 2008). These campsites occur on the river's second terrace, or on upland landforms. Nolan dart points were recovered at two of the sites. Middle Archaic components occur in an additional 21 multicomponent sites within the study corridor (Rogers and Russell 2008). Excavations at the John Ischy site (41WM49) dated a Middle Archaic component from recovered Nolan and Bell dart points (Sorrow 1969).

Researchers in Central Texas tend to divide the lengthy Late Archaic period into a variety of intervals. Prewitt (1981) used three phases (Uvalde, Twin Sisters, and Driftwood) for the period. Johnson (1995) split the Late Archaic into two subperiods, designated Late Archaic I and Late Archaic II. Collins (2004: Fig. 3.9a) recognized six style intervals (Bulverde, Pedernales/Kinney, Lange/Marshall/Williams, Marcos/Montell/Castroville, Ensor/Frio/Fairland, and Darl). The climate at the beginning of the Late Archaic was severely xeric, though mesic conditions gradually returned. Middle Archaic lifestyles and subsistence strategies continued, with burned rock middens reaching their zenith, particularly along the eastern Edwards Plateau during the time when Pedernales points were in vogue (Collins 2004). Between about 3500 and 2500 BP, less-xeric conditions prevailed and the use of burned rock middens diminished along the eastern edge of the plateau, although to the west dry conditions prevailed and xerophytes continued to be baked in earth ovens. Toward the end of the Late Archaic, evidence emerges of contact between the local peoples and cultures to the east, in the form of exotic artifacts suggestive of ceremonial practices. There is good evidence that the population substantially increased (Johnson 1995; Prewitt 1981).

Thirty-five single-component Late Archaic sites have been found within the SH 130 study corridor's crossing of the San Gabriel River (Rogers and Russell 2008). This is the largest number of single-component sites that occur along any of the five streams crossed by the SH 130 study corridor. An additional 28 multicomponent sites have been recorded that contained Late Archaic materials (Rogers and Russell 2008). Along the North Fork of the San Gabriel River lies 41WM30, a site with two rock shelters and a burned rock midden located approximately 7.42 km (4.61 miles) west of the current project area. Numerous cobbles, lithic debitage, and many stone tools suggest this was a raw material procurement site, while the presence of mussel shell indicates some of the associated subsistence pursuits. Two additional burned rock middens lie within the San Gabriel River drainage at sites 41WM824 and 41WM1101. Dart point types Frio, Darl, Montell, and Castroville were present at 41WM1101 which is located 0.50 km (0.31 miles) east of the project area (Rogers and Russell 2008). Extensive Late Archaic deposits were encountered during excavations at the Loeve-Fox site (41WM230) located approximately 17 km (10.6 miles) downstream of the current project area. Prewitt (1982) assigned these to two phases, the Twin Sisters and the Driftwood. The earlier Twin Sisters occupations were the most intensive at the site. Ensor dart points, Erath and San

Gabriel bifaces, and exotic artifacts including a boatstone, stone gorget, and a marine shell gorget were recovered, as well as numerous small basin hearths. At least four episodes of site use could be attributed to the Twin Sisters occupations, which occurred between 1,800 and 1,450 years ago (Prewitt 1982). The succeeding Driftwood occupations were not as extensive and lacked the exotic materials, which suggested territorial restrictions. The Mahomet (Darl) dart points found in these levels were seen as a possible indication of an intrusive group (Prewitt 1982).

At the Siren site (41WM1126), located approximately 7.89 km (4.90 miles) west of the current project area, five distinct cultural components were encountered; four of which were attributed to several phases of the Late Archaic II phases (Carpenter 2014a; Carpenter and Miller 2014). The earliest component at the site was attributed the San Marcos subperiod (2600 to 2400 BP) with Marcos, Frio, Ensor, and Castroville points. This was followed by the Uvalde phase (2300 to 2100 BP) with several point types including Frio, Ensor, and Marshall. The San Marcos component contained two formal, well- constructed, slab-lined features and two basin-shaped features. The Uvalde component contained two formal, slab- lined features, one basin-shaped feature, and three flat-based, single layered features (Miller and Hanselka 2014). The third and fourth components both dated to the Twin Sisters phase (2000 to 1900 BP) with Ensor, Frio and Fairland points. These components contained four formal, slab-lined features. The final Late Archaic component of the site was attributed to the Driftwood phase (1730 to 1550 BP) with two possibly associated Darl points (Carpenter 2014a; Carpenter and Miller 2014). The features consisted of one slab-lined feature and one basin-shaped feature (Miller and Hanselka 2014). Part of the analysis of the site structure and culture history of the Siren site was to determine if the concept of a 'Transitional Archaic' phase was viable. However, the synthesis of the site reaffirmed the solid division between the Late Archaic period and the Late Prehistoric (Carpenter 2014a; Carpenter and Miller 2014).

Late Prehistoric (ca. 1200 BP–400 BP)

The Late Prehistoric period is much shorter in duration than the preceding Late Archaic and has long been divided into two subperiods, designated Austin and Toyah. Prewitt (1981) categorized the two subperiods as phases, using the Midwestern Taxonomic System. Black (1986) preferred the term "horizon" to define the archaeological manifestations. Ricklis and Collins (1994) use the term "interval" to describe the components. Collins (2004:122) describes the division as an arbitrary break between the Archaic and Late Prehistoric, as hunting-gathering subsistence continued into the Late Prehistoric with the appearance of the arrow point, followed by the use of pottery, and finally the introduction of agriculture.

Austin Phase (ca. 1200 BP-1700 BP)

The Austin phase (ca 1200–1700 BP) identifies the early part of the Late Prehistoric period and is marked by the introduction of the bow and arrow, with the Scallorn arrow point style a marker for the phase. The technological replacement of the atlatl did not occur immediately and does not appear to have accompanied any major changes in lifestyle in Central Texas. As noted by Johnson (1995), there was little change in cultural practices other than the use of the bow and arrow, and hence the Late Archaic period could be considered to continue until about A.D. 1200, or when the Toyah phase replaces the Austin phase at ca. 800 BP (Johnson and Goode 1994). However, to the northeast in the Caddoan area and along the upper Texas coast, contemporary peoples were using pottery, farming, and living in sedentary villages, and some of the traits associated with these cultures were shared with Central Texas. In addition, as argued by Carpenter and Miller (2014), the distribution of the Scallorn point that spread far to the east is indicative that the Central Texas groups were tapping into a macroeconomic sphere including their contemporaries to the east. Thus, it seems appropriate to include the Austin phase in the Late Prehistoric period (Carpenter and Miller 2014). Widespread hostilities are thought to have occurred during this period, based on a number

of arrow-wound fatalities (Prewitt 1981:83), possibly the result of competition for favored trading partners to the east.

Three sites were excavated at Hoxie Bridge (41WM130, 41WM284, and 41WM294) as part of investigations at the Granger Reservoir (Bond 1978). Of these, 41WM130 was found to contain discrete evidence of occupations from the Late Archaic through the Toyah phase of the Late Prehistoric. Numerous stone-lined hearth features were uncovered at the site. The author concluded that the proximity of the site to a gravel deposit along the San Gabriel River was directly related to the location and reuse of the site as a habitation area. The Austin phase component at the site could be separated horizontally but not vertically from the succeeding Toyah phase component. Subsistence evidence demonstrated a reliance on plants and animal species that for the most part is still found in the area. Hearth design was found to be stable for the Late Archaic and Late Prehistoric occupations. Bond (1978:287) suggests that future work at similar sites should concentrate on individual behavioral patterns, particularly those that may have left manifestations of group size and social organization.

Austin phase occupations were extensive at the Loeve-Fox site, also located in the lands flooded to form Granger Reservoir (Prewitt 1982). The Austin phase components evidenced frequent occupations over a roughly 400-year period. Numerous stone-lined hearths occurred at the site, and the ratio of scraping and cutting tools to projectile points suggested an emphasis on gathering, though hunting was still a significant part of the subsistence strategy. A disproportionate ratio of flakes to cores suggested that initial stone tool reduction was conducted off-site. Marine shell artifacts found in the Austin phase component suggested direct or indirect contact with the Gulf Coast. The component included a cemetery containing 27 noncremated individuals and 10 cremations. Evidence of human aggression found in the skeletal remains is thought to be indicative of internecine warfare among contemporaneous groups (Prewitt 1982).

The Late Prehistoric component at the Siren site (41WM1126) is attributed to the Austin phase with Edwards and Scallorn points and indicated a resurgence of the use of burned rock features (Carpenter 2014a; Carpenter 2014b). The features encountered consisted of three formal slab-lined features, two basin-shaped features, and two flat-lined features (Miller and Hanselka 2014). The reemergence of the burned rock features suggests a more intensive occupation, and possibly repetitive occupation of the site. In addition, expedient tools and bifaces were more common. Although bison are absent during this period, the faunal assemblage indicates that lower-ranked species dropped out of the diet, likely indicating the efficiency of the bow and arrow technology in obtaining other larger game such as deer (Carpenter 2014b).

Toyah Phase (700 BP–400 BP)

The Toyah phase (ca. 700-400 BP) is the late subperiod of the Late Prehistoric. The archaeological manifestation of Toyah includes a number of traits that make it easy to distinguish from the earlier Austin phase, including ceramics (both locally made and imported), Perdiz arrow points, end scrapers, large thin bifaces, beveled knives, and prismatic blades (Collins 2004). The people who made and used these were fond of pursuing bison, though they also hunted deer, antelope, and other animals. The Perdiz arrow point used to bring down these animals was hafted into a narrow shaft without the benefit of a barbed stem for lashing. Burned rock middens do not seem to have been used during Toyah times; instead, large hearths were used for cooking meat and plants in crude ceramic vessels, surrounded by butchering stations perhaps used by multiple families (Johnson 1994). The occurrence of these traits across a wide area at about the same time constitutes what Black (1986) referred to as the Toyah archaeological "horizon." There is current debate among researchers as to whether this archaeological horizon reflects the geographic spread of people from a "Classic Toyah Culture" area (Johnson 1994), or whether it represents the spread of ideas that were picked up by different peoples (Ricklis and Collins 1994). Resolving this argument is unlikely. Linguistic evidence, which might have solved it, is missing, as by the time historic Indian groups were recorded, they

REDACTED FIGURE 5

Figure 5. Archaeological Sites Within 1 Kilometer of the Mankins Branch Site (41WM1398) (Texas Historical Commission 2021)

had undergone significant displacement and cultural change (Collins 2004). Johnson (1994:277–278) notes that the linguistic evidence from historic groups argues against the inference that a Classic Toyah culture was possessed by a single linguistic group. Rather, he sees the Classic Toyah culture as being borne by a very small number of large-scale linguistic groups, and that non-Classic Toyah culture, which occupied the surrounding areas, adopted components of the Toyah toolkit. Some question also exists regarding climatological conditions during the Toyah phase. Bog pollen data from east central Texas indicate a return to mesic conditions. At odds with this is the evidence from Halls Cave in the western Edwards Plateau where the ratio of least shrew to desert shrew (genera *Cryptotis* and *Notiosores*) points to drying conditions. Most researchers tend to support the xeric model (Collins 2005; Johnson 1995), but this would seem to conflict with the return of bison to the area, as in all other periods this animal spread as the climate became less dry. Perhaps the dry period was of relatively short duration, and the bison simply stayed in the area. Or perhaps because of the diversity of environments and the overlapping environmental gradients within Central Texas, any changes in precipitation (even if uniform) would result in changes in species proportions that would occur differentially across the landscape (Ellis et al. 1995:419).

In Williamson County, excavations at the Hoxie Bridge site (41WM130) uncovered Toyah materials including sandy paste and Leon Plain ceramics. As previously noted, these materials could be separated horizontally but not vertically from Austin phase materials (Bond 1978). At the Loeve-Fox site (41WM235), Toyah artifacts included Perdiz, Cliffton, and Young arrow points found in association with bison bones and large flat stone hearths. The bison remains are enigmatic in that while arrow points were found with the skeleton, no evidence was found that the animal had been butchered (Prewitt 1982). At Rowe Valley (41WM432), evidence of a large village, or rancheria, was found. Discrete activity areas, a midden, and hearth features were accompanied by artifacts including Leon Plain and Patton Engraved ceramics, and Perdiz, Cuney, Lott, and Guerrero arrow points, suggestive of a large amalgamation of native peoples. The overall circular pattern of the site is typical of Plains Indian villages recorded during historic times (Prewitt 2006).

Archaeological Sites Background Research

A search of the THC's *Texas Archeological Sites Atlas* revealed only one known archaeological site located within one km of the Mankins Branch site (41WM1398) (THC 2021). Located 682.78 m north of the APE along the San Gabriel River, site 41WM1101 is a multi-occupational site ranging from an unknown prehistoric time to the historic. The site area includes the Mankins Family Cemetery (**Figure 5**). The site was recorded in 2003 by non-professionals who stated, "There are tombstones with death dates of 1855, 1892, 1895, and 1948. Nearby historical markers include 1828, 1841, 1849 events." The investigators reported one intact prehistoric fire hearth and artifacts, but apparently kept the artifacts they recovered and did not list the type. They further stated that the site was in danger of destruction due to future road expansion and anticipated home construction.

A search of the *Texas Archaeological Sites Atlas* and the *Texas Historical Sites Atlas* did not reveal any Texas State Historical Markers within the 41WM1101 archaeological site boundary. However, located near 41WM1101 on SH 29, is historical marker #9049 commemorating the Double File Trail. The marker states:

> "Laid out about 1828 by Delaware Indians, 'The Double File Trail' got its name because two horsemen could ride it side by side. The Delawares carved this trace migrating ahead of expanding white settlements. They moved from what they called 'the Redlands' in East Texas to Mexico near present Nuevo Laredo. Of the 200 to 250 families reported in East Texas in the 1820s, only about 150 remained after the move. Early sites in Williamson County were settled where this trail crossed waterways. Texas Rangers and the Santa Fe Expedition also traveled the track. (1978)." (THC 2021).

Research Questions

The Mankins Branch site (41WM1398) was considered a very good candidate for mitigation (data recovery) excavations after completion of the Testing Phase of investigations even though the upper horizon and its feature(s) were disturbed, because the two lower cultural horizons contained deeply buried, intact strata and *in sitú* burned rock features. Additionally, there is a chance of more deeply buried and even earlier intact cultural horizons. Because of these stratified occupational horizons and features, the site may be able to address how prehistoric hunters and gatherers utilized the riparian zone along the Mankins Branch stream and the San Gabriel River watershed throughout a large period of Central Texas prehistory. During testing excavations, researchers were not able to go deeper than Features 4 and C due to the reach of the backhoe, and because the exposed features needed to remain in place until their delineation could be completed. The Data Recovery excavations will explore deeper soil strata for additional cultural horizons. Based on the depth of the sediments viewed from the adjacent stream cut-bank during the Testing Phase, there is a possibility of deeper and older cultural horizons than discovered thus far.

Since dating of the occupation levels, features, and horizons could not be completely resolved at the Testing Phase, it is a fundamental research question for the data recovery investigations. Data recovery investigations will delineate all the burned rock features and carefully document them before removing them to search for additional horizons and features. These investigations will seek to determine the structure and usage of the features. Investigations will go outside the deep impact area and into the adjacent shallow impact area, in order to completely delineate the features if necessary. The horizons around the buried features will be carefully hand excavated to search for living surfaces and associated artifacts. Samples will be taken from the burned rock cooking features for flotation and analysis of flora and fauna, and possibly palynology studies, to help determine the paleoenvironment of the region, if possible. Data recovery will include multiple AMS radiocarbon or other dating methods if datable materials are present, in order to clearly define the age of each occupational horizon.

Specific research questions include:

- Do any portions of Feature 1 (Burned Rock Midden Horizon 1) remain intact for archaeologists to investigate?
- If any portion of Horizon 1 is found to be undisturbed, can it be determined that Horizon 1 is one continuous horizon dating from the Archaic through the Transitional period, or is there evidence of a separate Transitional isolable horizon as seen at other similar sites in the region?
- Are there additional features in Horizon 2 besides Features A and B?
- Can living surfaces be located in Horizon 2 that are associated with Features A and B?
- What was the structure and usage of Features A and B?
- Can radiocarbon or temporal dates be obtained for Features A and B, and their occupational horizon?
- What is the size and structure of Features 4 and C?
- Can additional radiocarbon or temporal dates be obtained for Features 4 and C in Horizon 3?
- Can a usage of Features 4 and C be determined?
- Are there artifacts in Horizons 2 and 3 to date temporally?

Figure 6. Project Excavation APE at Mankins Branch Site (41WM1398)

- What lifeways of the prehistoric people of Mankins Branch can be determined by the site data and how do they compare to other riparian sites in Central Texas?
- Do deeper isolable cultural horizons exist beneath Horizon 3 (Features 4 and C)?
- Can an occupational timeline be established at the Mankins Branch site (41WM1398)?
- How does the Mankins Branch site (41WM1398) compare to other similar sites in Williamson County as described above?

Research Methodology

Prior to conducting the archaeological fieldwork, Atkins will submit this Research Design of Investigations to the THC, and after concurrence of the plan, will obtain a Texas Antiquities Permit. All archaeological fieldwork will be conducted by professional archaeologists and supervised by a RPA that meets or exceeds the *Secretary of the Interior's Standards for Principal Investigators* requirement and the THC's standards for Principal Investigators as defined in Title 13, Part II of the Texas Administrative Code, Chapter 26. All field work and mechanical excavations will be performed in a safe manner in full compliance with all applicable Occupational Safety and Health Administration (OSHA) safety regulations including those for deep trench excavations and laboratory research (29 CFR Part 1926).

As previously noted, the original "deep impact area" for the SH 29 Bypass Project was designated the area APE for excavations during the Testing Phase of the Mankins Branch site, while the rest of the planned ROW without anticipated deep impacts constituted the "shallow impact APE". Only the deep impact APE was deeply tested, while the shallow impact APE was surveyed by shovel tests during the initial project survey. It has also been noted that since the completion of the Testing Phase, the structural plans for the bridge and abutment were adjusted and the area of deep impacts was widened by the engineers; therefore, the deep impact APE for the archaeological mitigation needs to adjust accordingly from the one used during the Testing Phase. The area of the updated deep impact APE is 41.13 m x 7.13 m (141.5 ft x 23.4 ft) (**Figures 2 and 6**). Additionally, to ensure no significant archaeological deposits are removed without mitigation should deep impacts be inadvertently placed incorrectly, a "buffer" area of 2 m (6.5 ft) will extend along the east side of the deep impact APE and a 1 m (3.3 ft) buffer extended along the south and north sides of the deep impact APE. This buffer area will also be excavated during the mitigation. Thus, the updated area of deep impacts, plus the additional perimeter area as described above, will constitute the mitigation/excavation APE of 43.13 m x 9.13 m (13.15 ft x 2.78 ft) for a total area of 393.8 m² (120.03 sq. ft.) (**Figure 6)**. Note, that due to the close proximity to the edge of the terrace, no buffer is planned for the west side of the deep impact APE. However, some hand excavations may extend into the west wall in order to delineate features if they can be accomplished safely.

Before excavation begins, archaeologists will set a primary datum marked by a 1.27 cm (0.5 inch) rebar approximately 30 cm (1 ft) in length into the ground near the anticipated excavation area, for consistent measurement of the unit excavations by a Total Station that will be set over the datum daily. The total station datum location will be situated and mapped by use of a submeter GPS unit. All unit locations, starting elevations, and completion depths, as well as artifact and feature locations will be measured and digitally recorded using the total station.

Investigations will commence with relocating the previous testing excavation trenches and the careful removal of the backfill from the testing excavations by backhoe/trackhoe (backhoe) under the supervision of archaeologists. The bottom of the trenches and associated features were covered with tarps for protection at the end of the Testing Phase, so the backfill removal will terminate at the first sign of the tarps or when

the depths of backfill removal approaches the known depths of the features. Backfill sediment removal will continue by hand excavations at that point until all features and previous excavation units are exposed.

It was determined during the Testing Phase at the Mankins Branch site that the upper cultural horizon, the Burned Rock Midden Feature (Feature 1), was greatly disturbed by nonprofessional mechanical excavations by the landowner. Therefore, the machine operator, under the supervision of archaeologists, will carefully scrape the upper horizons of the deep impact APE not previously tested by archaeologists, and remove the sediments in order to expedite the ability of researchers to reach the undisturbed deeper cultural horizons. The soil from the upper midden will be set aside and used as backfill and will not be sifted through screens. The burned rock from the upper Burned Rock Midden will not be sorted, counted, or weighed. However, if archaeologists should determine that the midden sediments do not appear disturbed in an area, all scraping will stop, and archaeologists will proceed with hand excavations in the upper horizons. Additionally, the backhoe operator will bench the sides of the excavation units for safety in compliance with OSHA regulations. This area will lay outside the deep impact and excavation buffer area of the APE. Benching impacts will only extend as deep as necessary for safety. Should any cultural features be observed during the OSHA safety benching, archaeologists will stop the backhoe operator and investigate the features as described above. But if no features are observed, these sediments will not be sifted through screens or documented. It is anticipated the safety benching will not extend below the upper disturbed horizon.

Archaeologists will establish an excavation grid of 1-x-1 m units across the project excavation APE, incorporating the units created during the Testing Phase of the site as part of the mitigation study. All hand excavated soils will be sifted through 0.64 cm (0.25 inch) hardware cloth to search for artifacts. Artifacts recovered *in sitú* will be photographed in place and both horizontal and vertical locations recorded using the Total Station. Investigators will make sketches of each unit indicating the location of any *in sitú* artifacts or features before removing them, in order to investigate the horizons beneath. Excavation levels will be 10 cm (3.94 inches) in depth unless the depth is altered by the Principal Investigator. Units will be excavated as separate 1-x-1 m (3.3-x-3.3 ft) units or combined to form 1-x-2 m (3.3-x-6.6 ft) units at the direction of the Principal Investigator. Artifacts from each unit and level will be kept in separate field bags and each 10 cm (3.94 inch) unit level will be documented on a level form. Uniquely identifiable artifacts will be given a unique item number and logged into the field documents as such. Any charcoal, soil, or other samples will be logged as samples. Artifacts will be removed from the site daily and temporarily housed at the Atkins in-house laboratory in Austin, Texas. Burned rock and other features will be exposed, measured, and documented *in sitú*, then dissected as outlined in the Council of Texas Archaeologists (CTA) protocols for burned rock and other features. Burned rock will be divided by size, counted, and weighed in the field, then discarded. While *Rabdotus* shells will be noted, only whole *Rabdotus* shell will be documented, and weighed in the field, then discarded unless the Principal Investigator determines they should be kept for a specific purpose.

Cultural features identified during investigations will be excavated according to CTA and THC archaeological protocols. The tops and sides of burned rock features will be exposed, with the location and depth recorded using the Total Station, as well as the production of scaled drawings and photographs of the features. Features will be bisected to help determine their anatomy. Features will eventually be removed in their entirety in order to examine the underlying sediments. Any suspected pit features will be bisected and documented by hand sketches and photographs. Soil samples will be taken from all pit features if possible and tested as determined by the Principal Investigator.

After documentation and bisection, features will be removed, and all burned rock sorted, counted, and weighed. Hand excavations will continue beneath the feature to search for additional cultural horizons. Note: there are three currently isolable cultural horizons at the site. At a minimum, excavations will extend to all three cultural horizons, plus two excavation levels, in order to investigate them thoroughly. Currently

the deepest known features (Features 4 and C) extend to 1.74 m (5.7 ft) below the surface. The exact depth of the additional hand excavations beneath the lowest currently known horizon will be determined by the Principal Investigator but will be a minimum of two levels (20 cm [7.88 inches]). When all hand excavations are completed in the deep impact area, the backhoe will be brought back to the site and driven into the excavation area to carefully scrape the underlying sediments in order to search for even deeper buried cultural horizons. The backhoe excavations will be conducted under the careful supervision of qualified archaeologists as described previously and extend to either bedrock or to the full reach of the backhoe. Should additional cultural horizons and features be encountered, the backhoe scraping will stop, and excavations will continue with additional hand excavations. The exact total depth of anticipated excavations is unknown but expected to be approximately 3.66 m (12 ft) for a total of 1,441.3 m^3 (4,728.7 cubic ft) of soil excavated.

Artifact Collection

All diagnostic artifacts encountered will be documented *in sitú* if possible, including precise provenience measurements with the Total Station, unit sketches, and photography before removal. All collected artifacts will be transported to the Atkins in-house archeological laboratory in Austin for analysis and preparation for curation. Artifacts will be washed, catalogued, and labeled in compliance with the Center for Archaeological Studies (CAS) standards. Additionally, any *in sitú* datable materials recovered in occupational horizons or within features, such as charcoal, bone fragments, or mussel shell will be collected, and a selection sent for AMS radiocarbon dating.

Based on previous excavations, it is assumed the majority of the artifact assemblage will consist of lithic artifacts. Analysis of lithic artifacts will follow standards outlined in a modified form of the TxDOT Draft Lithic Analysis Protocol. Morphological characteristics of projectile points will be used to identify cultural affiliation when possible. The analysis will focus on the artifact taxonomy of any projectile point and tools recovered from the excavations. Metric information, such as length, width, thickness, and weight, along with raw material type will be recorded for complete projectile points and incomplete projectile point bases. At minimum, the debitage will be sorted by material type and completeness (flake vs. fragment vs. shatter) then count and weight will be recorded. Detailed artifact attribute analysis will be recorded at the direction of the Principal Investigator.

Any object mistakenly collected and determined to be of non-cultural origin will not be cataloged and will be discarded at the Atkins' Archaeological Laboratory.

Special Studies – Flotation, Macrobotanical Analysis, and Radiocarbon Dating

Archaeologists will attempt recovery of soil matrix samples from all intact cultural features located during the investigations. Various methods of analysis of the soil samples may be utilized including flotation and macrobotanical analysis, soil chemical analysis, and radiocarbon dating of organic materials from within the matrix. Additionally, any *in sitú* datable materials recovered in occupational horizons or within features, such as charcoal, bone fragments, or mussel shell will be collected, and a selection sent for AMS radiocarbon dating as directed by the Principal Investigator. The exact number and types of samples selected for dating will be based on the number of features discovered and the number of samples recovered during excavations. The number and selection of samples sent for dating will be at the discretion of the Principal Investigator; however, radiocarbon dating samples will not exceed 25 samples and other types of analysis of soil samples (light fraction, palynology, soil chemistry, etc.) will not exceed 20 samples.

Archaeologists will bisect all burned rock and pit type cultural features identified at the site in order to identify their structural composition and will collect a soil matrix sample for analysis if possible.

Macrobotanical remains will be examined and identified by a qualified paleobotanist. Analysis will be sufficient to determine if data is preserved to the extent that it can address important questions as to the lifeways of the aboriginal inhabitants of the site. Following this analysis, samples of burned wood, nutshell, or other dense organic remains may be submitted for radiocarbon dating.

Reporting

Following completion of the field work investigations, Atkins will prepare a Draft Report, including a discussion of the field investigations and laboratory analysis, and send it to Williamson County for review and comment. Following Williamson County's review of the Draft Report, Atkins will address comments and resubmit the Draft Report to Williamson County for final approval. Atkins will then submit a copy of the Draft Report to the THC for their review and comment through the THC's eTrac system. After review, the Final Report will be revised to address all THC comments. The Final Report will meet the report format standards of 13 TAC 26.24, including satisfaction of the THC and CTA's excavation reporting guidelines.

Atkins will provide one unbound copy and tagged PDF file of the Final Report (including a no-site location map version), and a GIS shapefile of the project area to the THC. Copies of the report will also be furnished to Williamson County and to various repositories across the state, in accordance with THC permit requirements. Atkins will also provide electronic versions of the report to the THC as directed at the time of submittal.

Curation

Upon completion of the archaeological fieldwork, all paperwork and collected artifacts will be transported to the Atkins in-house laboratory in Austin, Texas for analysis. Recovered diagnostic artifacts, subsistence remains, photographs, and field paperwork will be curated at the CAS in San Marcos, Texas in accordance with THC, CTA, and CAS requirements.

References Cited

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