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MCMILLEN ROAD IMPROVEMENTS/41COL395 MITIGATION PLAN SWF-2024-00078/TAP#31751

Introduction

In March 2024, Binkley & Barfield, Inc. contracted with AR Consultants, Inc. (ARC) to provide a cultural resources survey for the McMillen Road Improvements project in Collin County, Texas. The project involves making improvements to McMillen Road which includes the realignment, widening, and addition of sidewalks to approximately 8,200 ft (2.5 km) of McMillen Road between McCreary Road and County Club Road in the city of Wylie (Figure 1). Additionally, twin three-span bridges will replace the existing two-lane culvert bridge at Muddy Creek, crossing over the approximately 1,312 ft (400 m) wide floodplain. This project impacts wetlands along Muddy Creek and the City of Wylie initially worked under a Nation-Wide Permit #14 (NWP) with the Fort Worth District of the U.S. Army Corps of Engineers (USACE; SWF-2024-00078). Additionally, since the City of Wylie is a political entity of the State of Texas, under the Antiquities Code of Texas (Title 9 Chapter 191 of the Texas Natural Resources Code), a Texas Antiquities Permit #31751 was issued for the cultural resource survey. Construction activities commenced prior to the required Section 106 of the National Historic Preservation Act Class III Phase I Cultural Resource Investigation being performed. A Cease-and-Desist order was issued on March 20, 2024, by the USACE.

According to Binkley & Barfield, Inc., construction activities prior to the Cease-and-Desist order included the removal of asphalt pavement from two locations: where bridge columns overlapped with the road and a segment of the road that crosses an intermittent tributary on the east side of Muddy Creek. Additionally, 42 drill shafts, measuring approximately 3 ft (0.9 m) in diameter, were excavated to a depth of approximately 10 ft (3 m) below the surface. These shafts were excavated for the installation of bridge columns and caps. It was estimated by Binkley & Barfield, Inc. that these shafts were 70% complete prior to the Cease-and-Desist order. Installation of a storm sewer was also started, with about 7% completed, and involved the excavation of a trench approximately 4 ft (1.2 m) wide and 8-12 ft (2.4-3.7 m) deep. Approximately 27% of a 175-ft-long 10 in sanitary sewer was constructed, with 8-12 ft (2.4-3.7 m) of soil excavated from a 4 ft (1.2 m) wide trench for installation. A CIP culvert was 80% completed, with 10-12 ft (3-3.7 m) of soil removed for installation. Finally, construction of a 6x5 ft culvert was initiated, with 21% of the installation completed and approximately 8-9 ft (2.4-2.7 m) of soil removed for installation.

A damage assessment was conducted by ARC which estimated that approximately 17.1 acres, and 234,999.5 cubic m of soil had been disturbed. It was recommended by ARC and approved by the

THC and USACE on July 1, 2024, that trenching be performed in the Muddy Creek floodplain, where potential for prehistoric archaeology was high, and an archaeological survey be conducted in three areas where historic potential was hypothesized to be high based on a review of historic maps and aerial photographs. The survey was conducted May 7, July 8 to 11, and October 8 to 10, 2024. The archaeological report was approved by the review agencies on December 16, 2024 and Section 404 Permit SWF-2024-00078 was assigned to the project.

Prehistoric site 41COL395 (see Figure 2) was discovered during trenching in which eight pieces of FCR, three pieces of turtle shell, two charcoal fragments and two pieces of mussel shell were identified. Further investigations at the site determined that approximately 30 percent of the site had been removed as a result of the unauthorized construction activities performed for the McMillen Road Improvements project in February 2024 (Crater Gershtein et al. 2024).

On October 10, 2024, the City of Wylie met with representatives of the USACE, THC, and ARC at the project site to assess the situation and discuss a plan forward for getting the City of Wylie back into compliance. During that meeting, the USACE and THC indicated that after-the-fact mitigation measures would be required for the City of Wylie in order to regain compliance with their permits. The level of mitigation required would be based on the estimated “Archeological Value” of the areas that were impacted by construction without the required archaeological monitoring. A Memorandum of Agreement (MOA) would be produced and signed by all applicable parties. Potential mitigation measures that were discussed during that meeting included: efforts taken by the City of Wylie to minimize direct and indirect effects; providing support to institutions such as the Texas Archeological Research Laboratory (TARL), or similar institution; providing content for local institutions such as the North Texas Archeological Society; and conducting training for City of Wylie staff over topics related to Section 404 permitting, Section 106 of the National Historic Preservation Act (NHPA), and the Antiquities Code of Texas (ACT).

The following discusses the methods and assumptions utilized to estimate the “Archeological Value” and the mitigation measures that will be taken by the City of Wylie to regain compliance with the state and federal permits associated with this project.

Archaeological Value

For the purposes of this Mitigation Plan, “Archeological Value” (AV) was defined using the methods outlined in Technical Brief 20 from the National Park Service (McAllister 2007).

“Archeological Value” is defined in Section __.14 of the ARPA Uniform Regulations:

Archaeological value. For purposes of this part, the archaeological value of any archaeological resource involved in a violation of the prohibitions in § __.4 of this part or conditions of a permit issued pursuant to this part shall be the value of the information associated with the archaeological resource. This value shall be appraised in terms of the costs of the retrieval of the scientific information which would have been obtainable prior to the violation. These costs may include, but need not be limited to, the cost of preparing a research design, conducting field work, carrying out laboratory analysis, and preparing reports as would be necessary to realize the information potential (Section __.14(a)).

The AV is a projected cost for the retrieval of scientific information as a way to assess damages to archaeological resources caused by unauthorized acts as required by the legal system (McAllister 2007:13). According to McAllister, *“This determination requires the calculation of reasonable and credible costs for appropriate retrieval of scientific information from the damaged portion of the archeological resource if it was still in an undamaged condition. These costs should be proportional to the amount of damage in order to be accepted as a justifiable measure of the harm caused. Therefore, methodological considerations that would apply to actual retrieval of information from the archeological resource do not necessarily apply in an archeological value determination.”*

To estimate the AV, the volume of the site deposit within the disturbed areas (i.e., drill platform pits) that was excavated prior to completion of a Class III Phase I Cultural Resource Investigation needed to first be determined. To do this, the overall site area, including the two drill platforms, was calculated to be 942.9 m². Then, using the average thickness of the paleosol (the geological 2Ab horizon containing archaeological materials), which was calculated to be 0.35 m, the horizontal limits of the site boundary were determined to be 330 m³. The volume for the portion of the site within the horizontal limits of the two drill platforms areas (utilizing aerial photography; see Figure 3) was then calculated and subtracted from the site total as shown in Table 1. The AV will be calculated based on the damage to the 95.9 m³ portion of the known site 41COL395.

Table 1. Estimated soil loss at 41COL395 resulting from construction activities.

Activity	Avg. Thickness (m)	M ²	Volume (m ³)
Site 41COL395	0.35*	942.9	330
Drill Platforms (total=2)**	0.35*	274.01**	95.9
Total Difference		668.89	234.1

*Based on thickness of paleosol

**Square meters calculated from aerial photographs of Drill Platforms

Utilizing this volume, the total AV was then estimated using hourly rates for staff with various project roles associated with the project and its history. The various roles and their associated rates were provided by the USACE and are summarized in Table 2.

Table 2. Hourly USACE Rates for Project Roles.

Project Roles	USACE Rates
Project Manager	\$162.36/hr
Principle Investigator (Senior Archeologist)	\$136.53/hr
Project Director/Archeologist	\$91.02/hr
Crew Chief (Staff Archeologist)	\$71.34/hr
Archeological Technician (Field Technician)	\$61.50/hr
Laboratory Technician	\$54.12/hr
Archivist	\$75.03/hr
Lodging	\$110/day
Meals	\$68/day

ARC relied upon three primary data sources for the AV calculation. The first includes statistics gathered from other data recovery efforts that have occurred in the region and that are similar to archaeological sites like 41COL395. The examples used were provided by the USACE and the statistics from each data recovery effort for those examples are summarized in Table 3. The second data source includes Phase III work that has been previously performed by ARC in the region. This effort included ARC gathering all the hours worked and invoiced for work completed for recovery excavations at site 41TR314, including report writing, to establish the baseline for the excavation data recovery efforts. Finally, the hours ARC invoiced for the fieldwork, analysis, and reporting for the previous work conducted for site 41COL395 are shown in Table 4. Utilizing these data sources allowed ARC to create a data recovery budget for 41COL395 that would have made the scientific information retrieved from the site and the level of work needed to conduct such efforts comparable with other data recovery excavations in the region.

Table 3. Comparison of data recovery statistics from 41COL395 and other sites in the region

Trinomial	Hand Excavation (m3)	Mechanical Excavation (m3)	Site Size (m2)	Site Size (acres)	C14 Dates	Flot Analyzed	XUs	Soil Mag Sus	Features	Lithics	Faunal	OSL	FTIR Samples
41COL172	16.31	540	567	0.14	5	7	24	33	3?	856	6144	-	-
41DL203	41	20	52,401	12.9	7	~100	20	35	8	3022	11,776	-	-
41DL436	17.75	285	9,000	2.22	39	54	107	257	43	43	8,700	-	-
41TR314	4.7	246.7	389	0.09	5	10	10	6	5	106	2144	-	-
41COL395	1	140	943	0.22	1	0	0.3	0	0	1	4	0	0
41COL395	12.5	89.5	943	0.22	19	25	25	5	20	150	3,200	10	25

1 Green line represents data presented under TAP31751 in Crater Gershtein et al., 2024.

2 Purple line represents the additional data recovery assumptions covered by the AV.

Table 4. Estimated Value of the previous archaeological work for site 41COL395 based on USACE rates.

Project Role	Field Hours	Lab/Report Hours	Rate (per hour or sample)	Total Cost
Principal Investigator/Specialists	26	60	\$136.53	\$11,741.58
Crew Chief	45	4	\$71.34	\$3,495.66
Field Tech	40	0	\$61.50	\$2,460
Geoarchaeologist	32	80	\$136.53	\$15,291.36
Backhoe Rental (& Operator)	40	0	\$136.53	\$5,461.2
Per Diem (Days)	12	0	\$68	\$816
	# of Samples			
Radiocarbon Dates	1		\$890	\$890
			TOTAL	\$40,155.80

In addition to the data sources discussed above, the following assumptions were used to estimate the AV (Table 5):

- Coordinating a TAP or a modification to existing permit.
- Backhoe rental/operator shown at Specialist rate (ARC routinely works with archaeologists who were equipment operators).
- A local project with no lodging needed.
- Hand excavation of 12.5 m³ as a 13% sample of the total site volume.
 - 25 1x1 m units excavated through the 0.35-m-thick paleosol.
- Minimally what was done for the previous excavations and standards for most recent data recovery excavations
 - Flotation (from 50% of units)
 - Flotation samples from every identified feature
 - Stable Isotopes
 - 5 Magnetic Susceptibility samples
 - Particle size analysis
 - Radiocarbon Dates (minimum 19 additional dates)
 - 25 Fourier-Transform Infrared Spectroscopy (FTIR) Samples.
 - 10 Optically Stimulated Luminescence (OSL) Dates.
- Lab analysis of artifacts
- Report writing
- Curation

Table 5. Estimated Archeological Value of the 95.9 m³ damaged 41COL395.

Project Role	Field Hours	Lab/Report Hours	Rate (per hour or sample)	Total Cost
Principal Investigator/Specialists	100	173	\$136.53	\$37,272.69
Crew Chief	400	40	\$71.34	\$31,389.60
Field Tech	400	40	\$61.50	\$27,060.00
Palaeobotanical Analyst	0	45	\$136.53	\$6,143.85
Faunal Analyst	0	80	\$136.53	\$10,922.40
Geoarchaeologist	28	80	\$136.53	\$14,745.24
Mussel Shell Analyst	0	80	\$136.53	\$10,922.40
Backhoe Rental (& Operator)	35	0	\$136.53	\$4,778.55
Per Diem (Days)	112.5		\$68	\$7,650
	# of Samples			
Radiocarbon Dates (\$890)	19		\$890	\$16,910
FTIR Samples (\$660)	25		\$660	\$16,500
OSL Dates	10		\$1200	\$16,500
			TOTAL	\$196,294.73

Archaeological Value Summary

For the purposes of this Mitigation Plan, the AV was calculated utilizing the 95.9 m³ of site volume, to be \$196,294.73. As previously shown in Table 3, these proposed excavation efforts would be comprehensive and comparable with what has been done at other sites in the region and previously performed by ARC. As such, considering the above data recovery assumption and the scale of that data, it provides more than reasonable and credible costs for an appropriate retrieval of scientific information from the damaged portion of the archeological resource if it was still in an undamaged condition.

Furthermore, the estimated total AV for the scale of this proposed data recovery effort is much higher than the scale of information retrieval that is possible from the 95.9 m³ portion of the site that was damaged during construction. As such, this combined AV is an appropriate value to carry out 41COL395's mitigation plan.

Mitigation

To mitigate for the impacts to site 41COL395, ARC and the City of Wylie propose the following mitigation tasks:

1. Donation to the Center for Archaeological Studies (CAS), Texas State University Museum-in-a-Box program. Approximately 35% (\$68,292) of the funds will be spent on this task to aid CAS in the production of a Museum-in-a-Box for the North Texas Region that can be loaned out for public education. This task must be completed within five years following the execution of the MOA. A yearly summary will be provided to the agencies until the task has been completed. CAS estimated the cost for this task based on previous production costs for a Museum-in-a-Box for the Central Texas Region. The estimated cost considers CAS and ARC labor for developing content and production of materials, website updates, product launch/advertisement, and the material preparation/shipping/handling costs for 2 years (Table 6). These costs are then broken down between initial labor costs and maintenance/operations undertakings.

Action Items

- I. A development plan between CAS and ARC will be created.
- II. ARC will submit a proposal to the City of Wylie for the time and materials needed to collaborate with CAS in the production of the Museum-in-a-Box, to be signed within 3 months following the execution of the MOA.
- III. The City of Wylie will allocate the funds in preparation for the donation.
- IV. A donation agreement will be drafted by CAS and the City of Wylie, coordinated by ARC, outlining the expectations of both donor and donee.

- V. Six copies of the North Texas Museum-in-a-Box will be produced according to the development plan with five copies designated to CAS and one copy designated to the Wylie ISD.
- VI. An announcement of the completed Museum-in-a-Box will be dispersed to all schools in Wylie ISD. In addition, one copy of the Museum-in-a-Box will be left in the care of Wylie ISD.
- VII. A letter of completion from CAS will be sent to the USACE, THC, and City of Wylie as verification that Mitigation Task 1 has been completed.

Table 6. Cost breakdown for Mitigation Task 1.

Project Role	Work Hours	Rate	Total Cost
Principal Investigator	50	\$154 (per hour)	\$7,700
CAS Labor	590	Varied	\$27,631
M&O Costs	-	-	\$31,012
Added Cost for 1 box to remain in Wylie	-	-	\$1949
TOTAL			\$68,292

- 2. Regulatory training for the City of Wylie staff. Approximately 21% (\$41,580.00) of the funds will be spent on the development and execution of a training event to educate staff on Section 404 permitting, Section 106 of the National Historic Preservation Act (NHPA), and the Antiquities Code of Texas (ACT; see Table 7). This training must be held within the first year following the execution of the MOA.

Action Items

- I. ARC will submit a proposal for the work to be performed to the City of Wylie, to be signed within 3 months following the execution of the MOA.
- II. The City of Wylie and ARC will determine the time, date, and location for the regulatory training.
- III. ARC will notify the USACE and THC of the time, date, and location of the regulatory training.
- IV. The City of Wylie will provide a list of which staff, and how many, will be required to attend the training, to be approved by the USACE and THC.
- V. ARC will prepare a presentation and educational materials.
- VI. Training will be executed within the first year following the execution of the MOA.

Table 7. Cost breakdown for Mitigation Task 2.

Project Role	Work Hours	Rate	Total Cost
Principal Investigator	270	\$154 (per hour)	\$41,580.00
TOTAL			\$41,580.00

3. Donation to the Missing Archeological Site Forms in the Archeological Sites Atlas. The final 27% (\$52,920.00) of funds will be dedicated to archival work performed by ARC to research and submit up to 200 site forms and spatial data to TARL (Table 8).

Action Items

- I. ARC will submit a proposal for the work to be performed to the City of Wylie, to be signed within 3 months following the execution of the MOA.
- II. Upon receipt of the list of sites from the USACE, ARC will submit a Purchase Order to TARL for a file search of all sites.
- III. ARC will perform additional archival research as needed and produce the site forms and site boundary shapefiles for all sites, when possible. Site forms and spatial data will be submitted to TARL within five years following the execution of the MOA.
- IV. ARC will submit to the City of Wylie, USACE, and THC invoices from TARL as verification that Mitigation Task 3 has been completed within five years following the execution of the MOA. A yearly summary will be provided to the agencies until the task has been completed.

Table 8. Cost breakdown for Mitigation Task 3.

Project Role	Research Hours	Rate	Total Cost
Principal Investigator	180	\$154 (per hour)	\$26,720.00
TARL Staff File Search	40	\$50 (per hour)	\$2,000.00
Site Form/Shapefile Submission	-	\$121 (per site)	\$24,200.00
		TOTAL	\$52,920.00

4. Donation to the Texas Archeological Society's (TAS) Reports and Curation Committee. The remaining funds, approximately 17% (\$33,502.73), will be spent on this donation to fund analysis, reporting, and curation of field school collections that are pending for the Society (Table 9). The donation will be given within the first year following the execution of the MOA.

Action Items

- I. ARC will submit a proposal to the City of Wylie for the time and materials needed to coordinate the donation between parties, to be signed within 3 months following the execution of the MOA.
- II. The City of Wylie will allocate the funds in preparation for the donation.
- III. A donation agreement will be drafted by the TAS and the City of Wylie, coordinated by ARC, outlining the expectations of both donor and donee.
- IV. The agreed-upon funds will be transferred to the TAS.
- V. A letter of receipt will be sent to the USACE, THC, and City of Wylie as verification that Mitigation Task 4 has been completed.

Table 9. Cost breakdown for Mitigation Task 4.

Project Role	Work Hours	Rate	Total Cost
Principal Investigator	9	\$154 (per hour)	\$1,386.00
Donation to TAS			\$32,116.73
		TOTAL	\$33,502.73

Summary & Conclusions

The construction of the McMillen Road Improvement project prior to a cultural resources survey resulted in a violation of the City's Section 404 permit (USACE Permit SWF-2024-00078), Section 106 of the NHPA, and the ACT. Based on the estimated metric volume of the site situated within the impacted project area, an AV of \$196,294.73 was determined. The City of Wylie will utilize the AV to complete four mitigation tasks (Table 10). The City of Wylie will spend 35% (68,292.00) of the AV on the Center for Archaeological Studies, Texas State University Museum-in-a-Box program, and allocate \$41,580.00 (21% of the AV) toward archival work for the TARL Missing Archeological Site Forms in the Archeological Sites Atlas initiative. Additionally, the City of Wylie will utilize 27% of the AV (\$52,590.00) for a training event or training series to educate City of Wylie staff on Section 404 permitting, Section 106 of the National Historic Preservation Act, and the Antiquities Code of Texas. Finally, the City of Wylie will utilize the remaining 17% (\$33,502.73) of the AV to help the Texas Archeological Society's (TAS) Reports and Curation Committee fund analysis, reporting, and curation of field school collections that are pending for the Society. These actions will serve as an after-the-fact mitigation strategy to bring the City of Wylie back into compliance with the USACE and THC permits. Additionally, since the project involves a TAP from the THC, these after-the-fact mitigation measures will be added as an appendix to the original survey report (Crater Gershtein et al., 2024). ARC is currently preparing the associated paperwork for the project to be curated at the Center for Archaeological Studies (CAS) at Texas State University in San Marcos.

Table 10. Mitigation Task Costs.

Task 1	\$68,292.00	35%
Task 2	\$41,580.00	21%
Task 3	\$52,920.00	27%
Task 4	\$33,502.73	17%
Total	\$196,294.73	100%

If you have any questions, please contact me at 214-368-0478 or 682-712-3053.

Sincerely,



Kathryn M. Crater Gershtein, MA, RPA

Principal Investigator

AR Consultants, Inc.

References Cited

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