

**LAKE TALAWANDA SHOOTING RANGE SUPPLEMENTAL PHASE II
SITE INVESTIGATION REPORT**

**WATERWORKS ROAD, MCALESTER
PITTSBURG COUNTY, OKLAHOMA**

COOPERATIVE AGREEMENT NUMBER: RP-01F96701-3

Prepared For:

CHOCTAW NATION OF OKLAHOMA

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LIST OF ABBREVIATIONS AND ACRONYMS

ABCA	Analysis of Brownfields Cleanup Alternatives
AMSL	Above Mean Sea Level
BLRV	Blood Lead Reference Value
CDC	Centers for Disease Control
CEC	Civil & Environmental Consultants, Inc
CNO	Choctaw Nation of Oklahoma
Es ²	Environmental Science Services, Inc.
kg	kilograms
Leaaf	Leaaf Environmental, LLC
mg	milligrams
OWRB	Oklahoma Water Resources Board
RfD	Reference Dose
RSLs	Regional Screening Levels
RCRA	Resource Conservation and Recovery Act
TCLP	Toxicity Characteristic Leaching Procedure
µg/dL	micrograms per deciliter
USEPA	United States Environmental Protection Agency
XRF	X-Ray Fluorescence Analyzer

1.0 EXECUTIVE SUMMARY

Civil & Environmental Consultants, Inc. (CEC) was hired by the Choctaw Nation of Oklahoma (CNO) to conduct a Supplemental Phase II Site Investigation at the Lake Talawanda Shooting Range Brownfield Site (hereafter, "Site") located on Waterworks Road northwest of McAlester, Oklahoma. The property consists of approximately 185 acres of undeveloped land and a shooting range, formerly leased to the Eufaula Rod and Gun Club since approximately 1987, which is located on the western portion of the property. The firing lines are on a hillside, overlooking grass land that drains into downgradient ponds and wetlands. Previous work performed at the Site indicated the presence of elevated lead concentrations in surface soil within and downgradient of the former shooting range and in sediments, surface water, and fish tissue downgradient of the former shooting range. The purpose of this Supplemental Phase II Site Investigation is to delineate the extent of lead contamination in soil and sediment within and downgradient of the former shooting range. This data delineating the extent of lead contamination will allow more accurate evaluations of cleanup alternatives for the Site.

The supplemental site investigation was performed by CEC in November 2025. Field screening and confirmatory laboratory analyses show approximately 14 acres on the Site have soil and sediment that exceed the USEPA Regional Screening Level for lead of 200 mg/kg, equating to approximately 16,250 cubic yards of material. This investigation showed the site-wide average lead concentration is 339.5 mg/kg, with the site-wide average lead concentration of 275.6 mg/kg in soil and 1,431.7 mg/kg in sediment. This site investigation found that most of the contamination occurs in the top twelve (12) inches of soil and top six (6) inches of sediment.

The results of this supplemental site investigation were used to update the unit quantities and subsequent cost estimates for remedial action alternatives that were discussed in the Analysis of Brownfields Cleanup Alternatives (ABCA) prepared by CEC (2024). Remedial action alternatives evaluated include no action, site access restriction with fencing, phytoremediation, excavating contaminated soil and disposal on-site and excavating contaminated soil and disposal off site. Alternative #1: No Action, and Alternative #2: Site Access Restriction (Fencing) are not recommended because these alternatives do not address site risks and will not control or prevent potential erosion and relocation of lead from the contaminated area to the downstream Talawanda Lakes. Alternative #3: Phytoremediation is not recommended because of the long implementation time to address site risks and the potential for incidental human exposure due to lead accumulation in the plant species. Alternative #4: Excavation with Onsite Disposal and Alternative #5: Excavation with Offsite Disposal would be effective to remediate the lead contamination.

2.0 INTRODUCTION

Civil & Environmental Consultants, Inc. (CEC) was hired by the Choctaw Nation of Oklahoma (CNO) to conduct a Supplemental Phase II Site Investigation at the Lake Talawanda Shooting Range Brownfield Site (hereafter, “Site”) located on Waterworks Road northwest of McAlester, Oklahoma. The firing line for the skeet/trap shooting faces north within the shooting range staging area shown on **Figure 1**. The firing lines are on a hillside, overlooking grass land that drains into downgradient ponds and wetlands (which will be referred to as ponds for the remainder of this report). The ponds are within the likely radius of the fall zone of shotgun shot, and **Figure 2** shows the drainage flow path through the Site. The purpose of the supplemental site investigation was to identify areas of potential environmental contamination and to accumulate enough data to perform a site-specific risk evaluation of the property. All assessment activities were performed in compliance with the Quality Assurance Project Plan (QAPP) submitted to the CNO Brownfields Program and approved on September 30, 2025.

3.0 SITE DESCRIPTION AND OPERATIONAL HISTORY

The Site consists of approximately 185 acres of undeveloped land located on Waterworks Road, approximately one (1) mile north of McAlester, Oklahoma in Pittsburg County. The property is owned by the CNO and the shooting range has been leased to the Eufaula Rod and Gun Club since approximately 1987. The shooting range consisted of pistol, rifle, and shotgun ranges, with the shotgun range (which will be referred to as the shooting range for the remainder of the report) being the focus of this site investigation due to the lead contamination identified at the Site by previous reports. The ponds that are located within the fall zone of shotgun range and downgradient of the fall zone (**Figure 2**) were identified as former fish hatcheries on the United States Geological Survey 1967 topographic map, but the review of available aerial imagery suggests the ponds have not been used as fish hatcheries for multiple decades. The likely radius of the fall zone of shotgun shot is based on a 350-yard radius facing the direction of the shooting platforms for skeet shooting (National Skeet Shooting Association, 2002). Based on a cease-and-desist letter dated January 24, 2023, the shooting range ceased operations in January 2023, when the CNO revoked the lease from the Eufaula Rod and Gun Club due to the presence of lead at the Site and the CNOs efforts to remediate the lead contamination.

Previous work performed at this Site has included the following (the following reports are available upon request):

- An initial screening report prepared by CNO, dated March 2022;
- A Targeted Brownfields Assessment prepared by Environmental Science Services, Inc. (Es²) and Leaaf Environmental, LLC (Leaaf), dated February 2024;
- A Brownfields Phase II ESA Analysis Report, prepared by the CNO, dated February 2024; and
- An Analysis of Brownfields Cleanup Alternatives (ABCA), prepared by CEC, dated December 2024.

The previous work described in the above referenced reports indicated the presence of elevated lead concentrations in surface soil within and downgradient of the former shooting range and in sediments, surface water, and fish tissue downgradient of the former shooting range. The ABCA stated there was insufficient data to estimate the extent of lead contamination. Therefore, it was not possible to accurately estimate the quantities or lateral extent of contaminated material. The ABCA recommended additional soil and sediment sampling to better estimate the extent of lead contamination (CEC, 2024). Therefore, the purpose of this supplemental site investigation is to delineate the extent of lead contamination in soil and sediment within and downgradient of the former shooting range. The goal of this supplemental site investigation will be to use this supplemental data delineating the extent of lead contamination to more accurately evaluate the cleanup alternatives proposed in the ABCA (CEC, 2024). CEC recognizes the importance of delineating the extent of lead contamination as this will have a substantial influence on the cleanup options.

4.0 ENVIRONMENTAL SETTING

4.1 GENERAL

The Site consists of approximately 185 acres of undeveloped land within the Lake Talawanda watershed, a subwatershed of the Lower Coal Creek watershed. This Site is currently not open to the public and access is limited by locked gates and barbed-wire fence surrounding the property. The Site is located within the Lower Canadian Hills ecoregion characterized by a mosaic of hills and valleys in the structural Arkoma Basin. The mean annual precipitation, evaporation and

temperature is 48.5 inches, 60 inches and 61°F, respectively (Oklahoma Climatological Survey, 2023). More information can be found in the Lake Talawanda Watershed Management Plan (CEC, 2025).

4.2 TOPOGRAPHY

As shown on Figure 2, the elevation of the Site is approximately 680 feet above mean sea level (AMSL). The firing lines of the shooting range are on a hillside, overlooking grass land that drains into downgradient ponds and wetlands that drain eastward toward Lake Talawanda No. 1.

4.3 GEOLOGY

The Site is underlain by the Boggy Formation consisting of shale and sandstone with little to no limestone to provide alkalinity and buffering capacity. Previous soil borings installed by Oklahoma Environmental Services found that all borings met refusal at bedrock before a depth of 30 feet below ground surface. No groundwater was encountered in the soil borings performed during the investigation (Es² and Leaaf, 2024). Given the surficial nature of contamination, previously collected data, and the local geology, no groundwater contamination is expected at this Site.

4.4 HYDROLOGY

The Site consists of three wetland ponds that receive surface runoff from approximately 135 acres. The ponds are manmade structures, where embankments were constructed to dam water to be used as a fish hatchery. However, review of available aerial imagery suggests the ponds have not been used as fish hatcheries for multiple decades. These ponds flow east into Talawanda Lake No. 1. The ponds are within the likely radius of the fall zone of shotgun shot and previous reports have shown that total lead concentrations in the ponds exceeded Oklahoma Water Resources Board (OWRB) beneficial use criteria (Es² and Leaaf, 2024). Similarly, the tissue of game fish collected in ponds on the Site and downstream had detectable concentrations of lead (Es² and Leaaf, 2024).

5.0 PATHWAY/POTENTIAL RECEPTOR ASSESSMENT

The property and the majority of the surrounding properties within the Talawanda Lakes Watershed are owned by the CNO. The Site is currently not open to the public, but the CNO has indicated that future land uses could include opening the land to the public for hiking and other

outdoor recreational activities such as fishing and hunting or leasing the land for cattle grazing or agriculture. Due to the nature of the contamination, the primary concern is the protection of public health. The ABCA prepared by CEC in 2024 found that exposure to lead in surface soil and sediment as well as exposure to lead in surface water and fish tissue were the primary potential exposure pathways for future recreational users at the Site (CEC, 2024).

CNO has indicated that future land use could include harvesting culturally significant flora species such as wild indigo, rattlesnake master, and persimmons for human use. Some of these culturally significant flora species, such as persimmons are for consumption, while others, such as wild indigo are used for dyes or textiles. The potential for lead in soil to accumulate into wild indigo, persimmons, and other flora through uptake from the plant's root system is not known. It is anticipated that remediation of lead concentrations in soil at the Site to below the United States Environmental Protection Agency (USEPA's) current risk reduction goal of 200 mg/kg [risk reduction goal for both adult and child residential receptors (USEPA, 2024)] would greatly decrease the potential for significant lead uptake to plants. However, future sampling and laboratory analysis of plant tissue post-remediation (soil reclaimed/remediated) to reduce lead concentrations to less than 200 mg/kg) would have to be conducted to accurately evaluate potential risk. It is also noted that the lead impacts identified at the Site have been concentrated mostly within the top twelve- (12-) inches of soil. It is likely that most plants, including wild indigo and persimmons, will have established root systems that are deeper than the top 12-inches, meaning that the plants are drawing water and nutrients primarily from unimpacted subsurface soil.

6.0 SAMPLING ACTIVITIES

6.1 FIELD SAMPLING AND ANALYSES

Sampling activities were performed by CEC personnel in November 2025 and followed the approved QAPP. Sampling occurred within a 350-yard radius from the firing line of the shooting range that represents the down-range direction that shot would fall. The area was divided into 150 ft by 150 ft rectangular grids (approximately 0.5 acres). Within each grid occurring on dry land, five (5) aliquot sampling locations were recorded using a handheld GPS as shown in **Figure 3**. Soil samples were collected in six- (6-) inch intervals from each location within a grid, composited and then analyzed for lead ([Pb]) concentrations using an x-ray fluorescence (XRF) field analyzer. The remainder of the composite sample volume was stored in a labeled soil sample bag and put into a cooler for potential laboratory analysis. If the composite sample from 0-6 inches or 6-12 inches exceeded 175 mg/kg Pb when analyzed in the field with the XRF, another 6-inch interval (12-18 inch) sample was collected from each of the five (5) locations, mixed and homogenized and analyzed with an XRF field analyzer. If the 12-18 inch samples exceeded the 175 mg/kg Pb threshold, an additional 18-24 inch sample was collected and analyzed. The 175 mg/kg value was selected based upon the 200 mg/kg USEPA residential Regional Screening Level (RSL) for lead with an allowable error margin to account for potential inaccuracies of the field screening compared to laboratory analysis.

Sampling grids consisting of more than 50% open water were sampled at five (5) random sampling locations within the open water portion of the grid. A small boat was used to collect sediment samples from open water areas using a stainless-steel bottom grab dredge sampler from an estimated depth of zero (0) to six (6) inches. Sediment samples that were accessible on foot, but still in saturated conditions (e.g., shallow standing water or saturated hydric soils) were collected using stainless steel hand tools from a depth of zero (0) to six (6) inches and placed into a labeled soil sampling bag. Since the XRF loses accuracy when analyzing saturated soils, the samples were allowed to air dry in accordance with the QAPP over a period of few days before being analyzed using the XRF. Sediment cores were collected from each of the three ponds. The sediment was air-dried and then analyzed with the XRF.

6.2 LABORATORY ANALYSES

A subset of the collected soil and sediment samples were sent to Accurate Environmental Laboratory for analysis. Soil lead ([Pb]) analysis was conducted to determine the extent of lead contamination. Similarly, selected samples were sent for Toxicity Characteristic Leaching Procedure (TCLP) analyses to determine if the soils exceed the Resource Conservation and Recovery Act (RCRA) lead RCRA characteristic hazardous waste threshold [5 milligrams per liter (mg/L)]. Soils that exceed the RCRA lead characteristic hazardous waste threshold may require the addition of soil amendments to decrease lead leachability or be disposed of in a hazardous waste landfill. The TCLP samples were selected based on lead concentrations, soil composition, and location. **Table 1** shows the analytes, number of samples and analytical methods used for the samples collected.

Table 1: Number of samples sent for laboratory analysis and the analytical tests performed.

Matrix	Analyte	Number of Samples	Extraction Method	Analysis Method
Soil/Sediment	Lead	112	USEPA SW-846 Method 3050	USEPA SW-846 Method 6010B
	TCLP	6	USEPA SW-846 Method 1311	USEPA SW-846 Method 6010B

7.0 ANALYTICAL FINDINGS

Lead results from the in-field screening with an XRF and from samples submitted for laboratory analysis are shown in Tables A1, A2 and A3 in **Appendix A**. The laboratory reports are found in **Appendix B**. The results of the soil analyses were evaluated with respect to the USEPA residential RSL for lead of 200 mg/kg. The supplemental site investigation found that most of the contamination occurs in the top 12 inches of soil and top six (6) inches of sediment (**Figure 4**).

TCLP analyses were conducted on five soil samples and one sediment sample (**Table 2**). Three samples exceeded the RCRA TCLP limit of 5.0 mg/L. The three samples that exceeded the TCLP limit also had the greatest soil lead concentrations.

Table 2: TCLP results and corresponding field screening XRF and total lead concentrations.

Description	Depth	XRF Pb [mg/kg]	Laboratory Pb [mg/kg]	TCLP Pb [mg/L]
Soil				
TWSR-G22	0" - 6"	367	284	1.15
TWSR-G24	0" - 6"	245	263	3.39
TWSR-G34	6"- 12"	751	624	1.98
TWSR-G51	0" - 6"	2,503	1,840	12.4
TWSR-G59	0" - 6"	1,517	920	5.95
Sediment				
TWSR-G43	0" - 6"	1,263	2,710	9.8

Based on a correlation from the data shown in **Table 2**, soil or sediment with lead concentrations greater than 900 mg/kg will likely exceed the TCLP threshold of 5.0 mg/L. Therefore, areas where soils and sediments exceed 900 mg/kg will either need to be amended to decrease lead leachability and/or mixed with lower concentration material to decrease the total soil concentrations prior to disposal.

8.0 RISK EVALUATION

Human health risk evaluation of lead is unique because a reference dose (RfD) value for lead is not available. An RfD is typically derived from a concentration below which no adverse health effects have been observed for a given chemical; however, for lead, existing evidence indicates that adverse health effects occur even at very low exposures (e.g., subtle neurological effects in children have been observed at low doses). Therefore, since the toxicokinetics (the absorption, distribution, metabolism, and excretion of toxins in the body) of lead are well understood, lead is regulated based on blood lead concentration. The Centers for Disease Control and Prevention (CDC) publishes a Blood Lead Reference Value (BLRV) representing the actual blood lead concentrations of 97.5% of the population. The CDC updated the BLRV to 5 ug/L in 2012 and again to 3.5 ug/L in 2021. USEPA's risk reduction goal for contaminated sites is to limit the probability of a child's blood lead concentration exceeding 3.5 µg/dL to 5 percent or less of the population after cleanup. The USEPA calculated concentration for lead meeting this risk reduction goal is currently 200 mg/kg for both adult and child residential receptors (USEPA, 2024). Accordingly, a cleanup goal of 200 mg/kg has been established for the Site. This goal is consistent with the risk evaluation performed as part of the ABCA which was prepared in accordance with

USEPA methodologies, applicable federal guidance, such as the USEPA Risk Assessment Guidance for Superfund (RAGS) Part A (USEPA, 1989), Part E (USEPA, 2004), and Part F (USEPA, 2009), and other resources (CEC, 2024). It is noted that this cleanup goal is conservative, in that it is protective of residential receptors, which would have a higher exposure than recreational receptors. Meeting a cleanup goal of 200 mg/kg would allow for future unrestricted use of the Site.

When evaluating lead against the benchmark of 200 mg/kg, it is appropriate to use the Site-wide average lead concentration. Accordingly, this risk evaluation includes calculating the Site-wide average lead concentration using the supplemental site investigation data collected in November 2025. For this evaluation, only analytical results from samples submitted for laboratory analysis were used. Parent and duplicate samples were not evaluated as discrete samples; the sample with the greater concentration of lead was conservatively used as the representative sample for each grid. Similarly, each grid was represented by the sample with the greatest concentration, irrespective of depth. The greatest concentration in each grid was in the 0” to 6” sample for 45 of the 49 grids with laboratory data. The remaining four (4) grids had the greatest concentration in the 6” to 12” sample. Non-detected results were conservatively evaluated as a detected result at the detection limit.

Use of bootstrapping has been a technique widely applied by the U.S. EPA to represent confidence intervals (Arcadis, 2013). Bootstrap procedures are robust nonparametric statistical methods that can be used to construct approximate confidence limits for a population mean. While performing bootstrap procedures, repeated samples from a data set are drawn with replacement from a given set of observations. The process is repeated a large number of times (e.g., thousands), and each time an estimate of the desired unknown parameter (e.g., the sample mean) is computed (U.S. EPA, 2002). Non-parametric bootstrapping simulations (5,000 simulations) were performed using Microsoft Excel and IBM SPSS software to assess the 95% confidence level for the site-wide average lead concentration. The Site-wide average lead concentration (including both soil and sediment analytical results) is 547 mg/kg with the 95% upper confidence level of the calculated average of 750 mg/kg.

These results exceed USEPA's risk reduction goal of 200 mg/kg for both adult and child residential receptors, indicating the potential for unacceptable risk to recreational receptors. Accordingly, in accordance with U.S. EPA guidance, an iterative truncation method was used to assess the average lead concentration (USEPA, 2024B) in order to determine which sample grids would have to be remediated in order for the Site-wide average lead concentration to be below the benchmark of 200 mg/kg. The iterative truncation method consists of ordering the sampler data from lowest to highest concentrations and replacing the highest concentration with a post-remediation concentration until the site average and the 95% upper confidence level is less than or equal to the benchmark of 200 mg/kg. These results are summarized below in **Table 3**.

In each table, the highest lead concentrations were systematically replaced with the Site-wide average lead concentration below the benchmark of 200 mg/kg until the average lead concentration was less than the benchmark of 200 mg/kg. The Site-wide average lead concentration was calculated to be 99 mg/kg and assumed to be representative of the background concentration at the Site. The table lists the Sample IDs representing respective grids that will need to be remediated to reach this benchmark. As shown below in **Table 3**, when considering the Site as a whole, fifteen (15) sampling grids will require remediation to bring the site-wide average lead concentration to 153 mg/kg with the 95% upper confidence level of the calculated average of 190 mg/kg. The statistical analysis output can be found in **Appendix C**.

Table 3: Calculated Site-wide average lead concentrations (soil and sediment results) based on remediation of grids with the greatest lead concentration. The average and 95% upper confidence level (UCL) are shown.

Site-ID	Depth	Lead Concentration ¹ (mg/kg)	Post-Remediation Lead Concentration ² (mg/kg)
TWSR-G43	0" - 6"	3090	99
TWSR-G35	0" - 6"	2230	99
TWSR-G51	0" - 6"	1840	99
TWSR-G42	0" - 6"	1800	99
TWSR-G44	0" - 6"	1640	99
TWSR-G36	0" - 6"	1390	99
TWSR-G33	0" - 6"	1220	99
TWSR-G45	0" - 6"	1210	99
TWSR-G72	0" - 6"	1190	99
TWSR-G60	0" - 6"	1150	99
TWSR-G34	0" - 6"	1060	99
TWSR-G59	0" - 6"	920	99
TWSR-G37	0" - 6"	867	99
TWSR-G52	0" - 6"	600	99
TWSR-G38	0" - 6"	570	99
Site-Wide Average		547 (95% UCL: 750)	153 (95% UCL: 190)

¹ The lead concentrations included were the maximum lead concentrations based on laboratory samples of soils and sediments from zero (0) to twelve (12) inches.

² The average lead concentration based on laboratory samples of soils below the 200 mg/kg RSL was calculated to be 99 mg/kg.

9.0 REMEDIAL OPTION EVALUATION

9.1 REMEDIAL ACTION OBJECTIVES

The primary project objective is to decrease the lead contamination in soil and sediment at the Site to acceptable levels for unrestricted use. Five (5) different alternatives were considered to address the lead contamination at the Site caused by the previous property use as a shooting range, including:

- Alternative #1: No Action;
- Alternative #2: Site Access Restriction (Fencing)
- Alternative #3: Phytoremediation
- Alternative #4: Excavation and Onsite Disposal
- Alternative #5: Excavation and Offsite Disposal

A summary of the analysis of brownfield cleanup alternatives is discussed in the following section. The detailed evaluation of these cleanup alternatives is discussed in the ABCA (CEC, 2024). The purpose of this evaluation is to update the unit quantities and subsequent cost estimate for the alternatives based on the data collected as part of this supplemental site investigation.

9.2 REMEDIAL ACTION ALTERNATIVES

The following remedial action alternatives were discussed in greater detail in the ABCA prepared by CEC (2024) and were updated based on the results of this supplemental site investigation. The opinion of probable cost for each alternative is considered to be representative of a conceptual screening (0% to 2% design development phase). These estimates are classified as a Class V Estimate according to Association for the Advancement of Cost Engineering International (AACE, 2020). The Class V Estimate has an expected accuracy range of -50% to 100%. Therefore, the values presented in this section for each alternative have a range of -50% to 100%, as shown in the respective cost tables for each alternative.

Alternative #1: No Action – This alternative would involve no further action, leaving the Site in its current condition. The no action alternative is not a viable solution for controlling or preventing

exposure to contamination at the Site. The no action alternative will not control or prevent potential erosion and relocation of lead from the contaminated area to the downstream Talawanda Lakes.

Estimated Opinion of Probable Cost: **\$0**

Alternative #2: Site Access Restriction (Fencing) – This alternative includes constructing a chain link fence and placing signage to control entry into the contaminated area (considered to be any grid with concentrations exceeding 200 mg/kg). The fence and posted signs warning visitors of the human health hazards from exposure to lead, including the consumption of native plants and wildlife, would create an easily identifiable boundary to detour visitors from attempting to enter the contaminated area. This alternative will not address the contamination and will not prevent lead from mobilizing beyond the current extent of contamination. Thus, site access restriction will not decrease the concentrations of the contaminants. The cost items for this alternative are shown in **Table D1** in **Appendix D**.

Estimated Opinion of Probable Cost: **\$250,300**

Class V Range (-50% to +100%): \$125,200 to \$500,600

Alternative #3: Phytoremediation – This alternative would consist of planting selected species to uptake lead from the contaminated area. The contaminated area is based on grids that exceeded 200 mg/kg lead, which totaled 11.5 acres of upland areas and 2.5 acres of wetlands/pond areas. Phytoremediation has been shown to decrease lead concentrations in soils (Yao et al., 2023; Zhang et al., 2024). However, incidental ingestion and disposal of plants that have accumulated lead are two major challenges with phytoremediation (Yao et al., 2023). Similarly, phytoremediation could take decades to decrease current concentrations on the Site to meet the RSL assuming an annual effectiveness of 30 to 50 mg/kg per growing season in the grids with the greatest concentrations (CEC, 2024). Grids with lesser concentrations, closer to the 200 mg/kg threshold, will have less annual uptake. Therefore, the opinion of probable cost assumed 20 years of planting and harvesting vegetation used for phytoremediation. While this alternative is moderately easy to implement because little to no earthwork is required, it does require biannual mobilization of people and equipment to harvest and plant the selected phytoremediation crop. Without crop harvesting and

disposal, any lead taken up by the vegetation will be returned to the soil once the vegetation dies. The cost items for this alternative are shown in **Table D2** in **Appendix D**.

Estimated Opinion of Probable Cost¹: **\$3,394,000**

Class V Range (-50% to +100%): \$1,944,900 to \$7,779,500

¹Assumes 20 years at 3% inflation per year

Alternative #4: Excavation with Onsite Disposal – This alternative would consist of the following remediation steps:

- Excavating contaminated soils and sediments;
- Processing excavated material to remove lead shot and amend with lime;
- Construct an onsite repository consisting of a clay liner and place processed material into repository;
- Install clay cover and vegetation cover to encapsulate processed material.

Excavation with onsite disposal is an effective way to eliminate risk at the Site, as long as the cap is maintained. The soil processing to remove lead shot will decrease the total lead in the contaminated material, and the lime addition will increase soil pH to stabilize the lead in the capped soils. The pH stabilized soil, in addition to a constructed clay liner, will prevent lead from leaching into the groundwater. The soil processing is also expected to result in a more homogenous material with overall lower lead concentrations. The cap thickness will be sufficient to allow for wear from recreational use and will be an effective way to prevent recreational receptors from coming into direct contact with contaminated soils. In addition to the engineered control (i.e., cap), institutional controls, such as land use restrictions, would need to be recorded on the deed to prevent future activities that could potentially damage the cap. It was assumed that construction quality assurance will be required throughout the entire project to oversee the liner installation and periodically test the liner and final cover materials.

The volume of contaminated material to be excavated was calculated using two methods, identified as Alternatives 4A and B. Alternative 4A is based upon the Site-wide average discussed in Section 8.0. Alternative 4B is a more conservative not-to-exceed approach where all grids that exceed 200

mg/kg of lead will be remediated. This second alternative is provided to allow CNO to make the determination if they would prefer to use a Site-wide average, which assumes individuals would utilize the entire Site equally as part of the risk evaluation, versus an assumption where any given location within the Site will meet the 200 mg/kg cleanup goal.

Alternative 4A: Site-Wide Average - This will consist of remediating 15 grids that measure 150 ft by 150 ft and remediated to a depth of six-inches. Therefore, a total of approximately 6,250 cubic yards (CY) will need to be excavated and capped on Site. The values from all grids that require remediation as discussed in Section 8.0 are from the 0” to 6” depth range. The 15 grids requiring remediation are the soils and sediments with the highest lead concentrations making them more likely to exceed RCRA characteristic hazardous waste thresholds based upon TCLP analysis. Therefore, the remediated soils in Alternative 4A will likely require substantial lime amendments and/or potentially to be mixed with cleaner on-site soil to pass the TCLP analysis

Alternative 4B: Full Site <200 mg/kg - This will consist of remediating 39 grids measure 150 ft by 150 ft by six-inches. Therefore, a total of approximately 16,250 cubic yards (CY) will need to be excavated and capped on Site.

The updated cost items for each of these sub-alternatives are shown in **Tables D3 and D4 in Appendix D.**

Alternative	Estimated Opinion of Probable Cost	Class V Range (-50% to +100%):
Alternative 4A: Site-Wide Average	\$885,200	\$442,600 to \$1,770,400
Alternative 4B: Full Site <200 mg/kg	\$1,397,500	\$698,800 to \$2,795,000

Alternative #5: Excavation with Offsite Disposal – This alternative will consist of excavating contaminated material as described in Alternative 4, but the material will be hauled to the nearest landfill for disposal, rather than onsite disposal. As with Alternative 4, this alternative is divided into two sub-alternatives based on excavation volumes for a Site-wide average of less than 200 mg/kg (Alternative 5A) and remediating the entire Site to less than 200 mg/kg (Alternative 5B; not to exceed approach).

Excavation with offsite disposal is an effective way to eliminate risk at the Site, since contamination will be removed, and the exposure pathways will no longer exist. It was assumed the excavated material will not be classified as hazardous waste and can be hauled to the nearest landfill, located near Alderson, OK. It was assumed that construction quality assurance will be required throughout the entire project to collect confirmation samples showing the remaining soils meet the 200 mg/kg lead goal following excavation.

The updated cost items for each of these sub-alternatives are shown in **Tables D5** and **D6** in **Appendix D**.

Alternative	Estimated Opinion of Probable Cost	Class V Range (-50% to +100%):
Alternative 5A: Site-Wide Average	\$1,400,800	\$700,400 to \$2,801,700
Alternative 5B: Full Site <200 mg/kg	\$2,979,500	\$1,489,700 to \$5,959,000

10.0 REFERENCES

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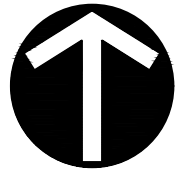
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Yao, X., E. Saikawa, S. Warner, P.E. D'Souza, P.B. Ryan, and D.B. Barr (2023) Phytoremediation of Lead-Contaminated Soil in the Westside of Atlanta, GA. *GeoHealth* 7:8. DOI: 10.1029/2022GH000752.

Zhang, L., Y. Zhu, H. Gu, S. Shiung Lam, X. Chen, C. Sonne, W. and Peng (2024) A review of phytoremediation of environmental lead (pb) contamination. *Chemosphere* 362. DOI: <https://doi.org/10.1016/j.chemosphere.2024.142691>.

FIGURES



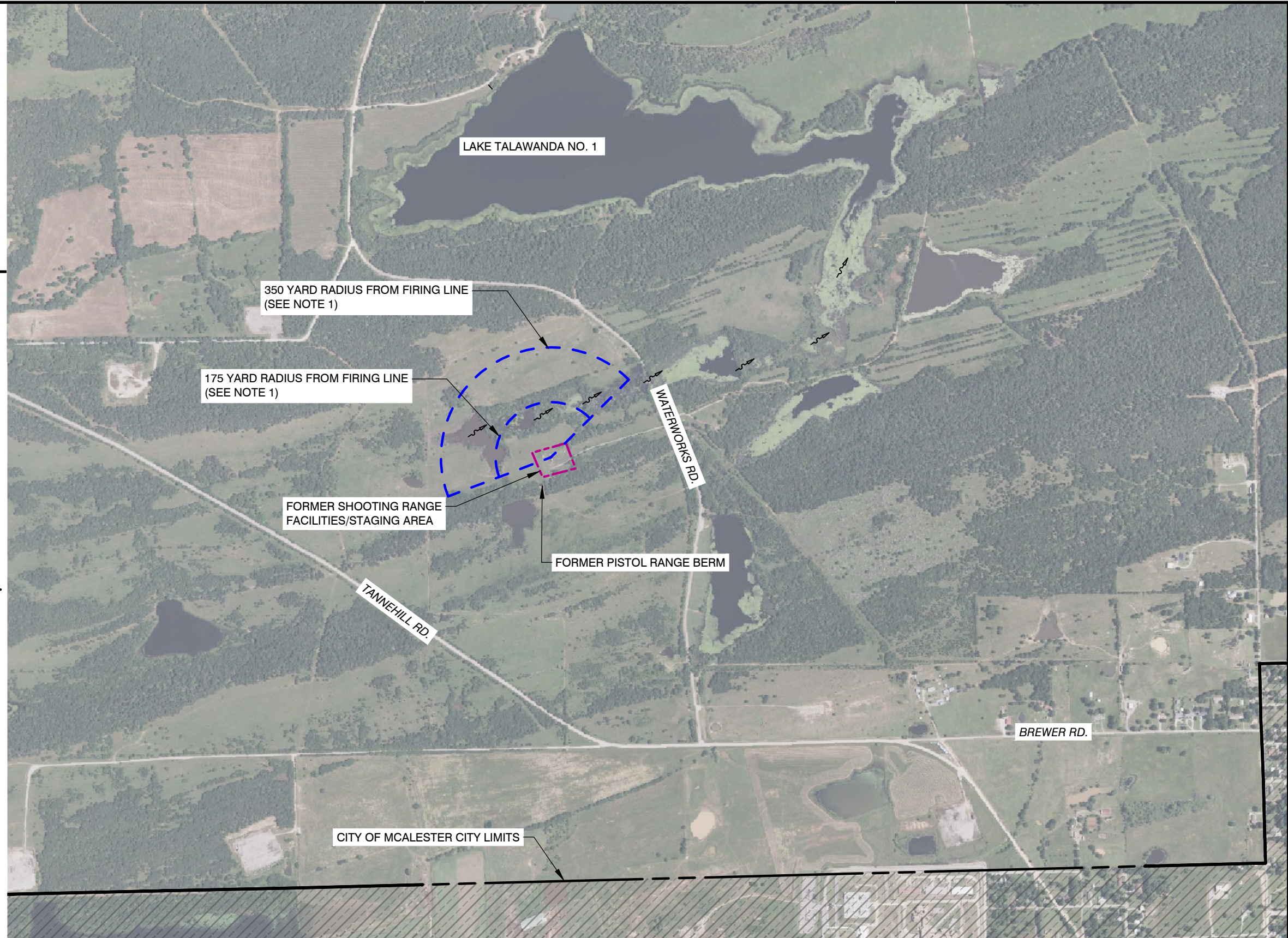
NORTH

LEGEND

- FORMER SHOOTING RANGE FACILITIES
- ESTIMATED RADIUS OF SHOT FALL ZONES
- MCALESTER CITY LIMITS
- DRAINAGE FLOW DIRECTION

NOTES

1. 350 YARD RADIUS REPRESENTS THE SHOT FALL ZONE MAXIMUM FOR #1 SHOT AND THE SMALLER 175 YARD RADIUS REPRESENTS FALL ZONE FOR MOST COMMONLY USED SHOT FOR SKEET SHOOTING, #9 SHOT.



REFERENCE

1. AERIAL IMAGERY COURTESY OF MICROSOFT INC. ACCESS OCTOBER 2024.
2. EXISTING CONTOURS DERIVED FROM OKMAPS.ORG, BASED ON LIDAR COLLECTED JULY 24, 2019. ACCESSED OCTOBER 2024.



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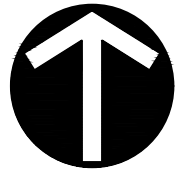
CHOCTAW NATION OF OKLAHOMA
LAKE TALAWANDA SUPPLEMENTAL PHASE II
FORMER TALAWANDA SHOOTING RANGE
PITTSBURG COUNTY, OKLAHOMA

SITE VICINITY MAP

DRAWN BY:	NLS	CHECKED BY:	EAS	APPROVED BY:	EAS
DATE:	FEB. 2026	DWG SCALE:	AS SHOWN	PROJECT NO:	352-224

FIGURE 1

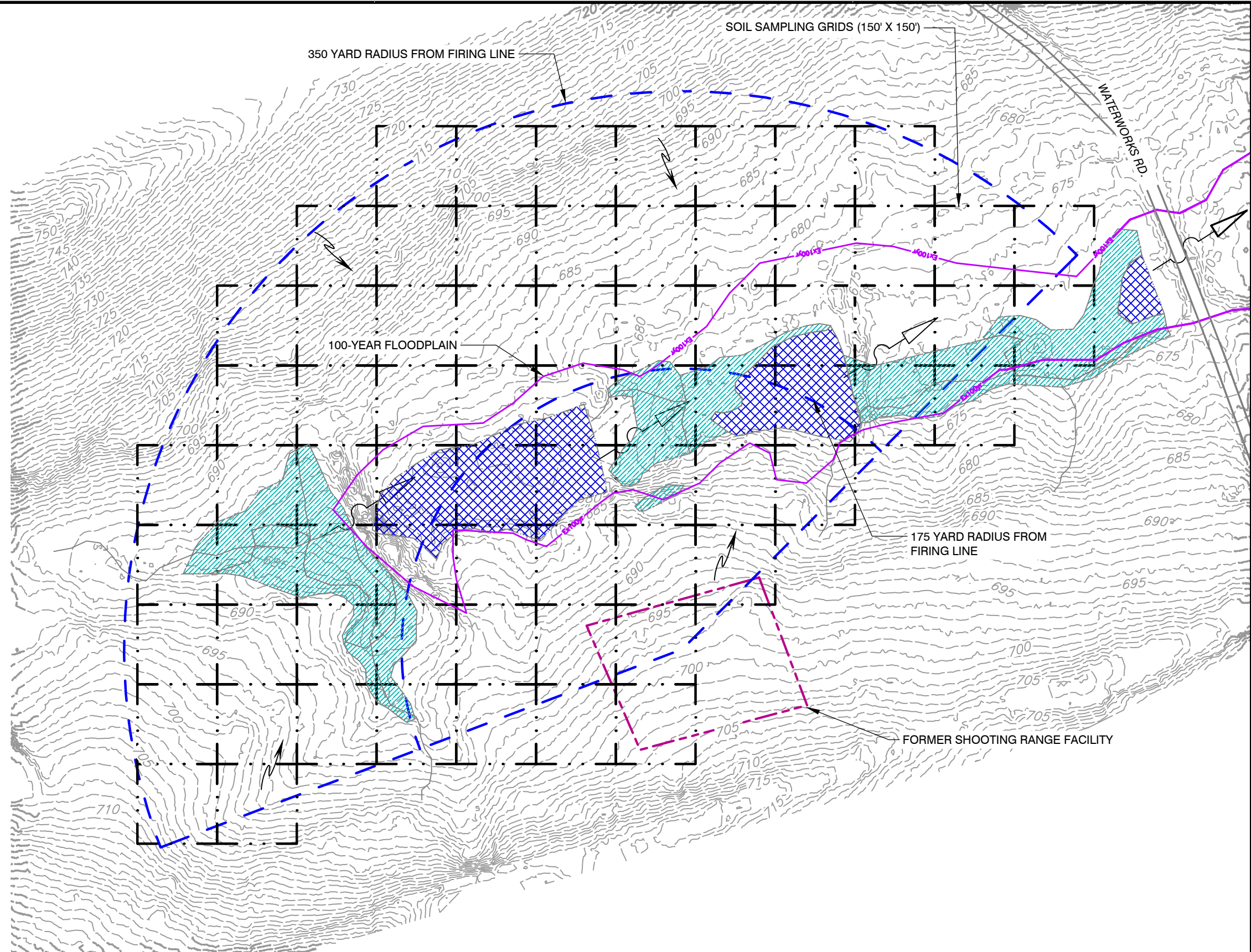
F:\350-000\352-224\CADD\Dwg\352224-EV01-Figure 1 Site Vicinity Map.dwg\FIGURE 1 LS(1/4/2026 - nshepherd) - LP: 2/8/2026 12:50 PM



NORTH

LEGEND

- FORMER SHOOTING RANGE FACILITIES
- ESTIMATED RADIUS OF SHOT FALL ZONES
- SURFACE SOIL SCREENING GRID
- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- OVERLAND FLOW DRAINAGE PATH
- CHANNEL FLOW DRAINAGE PATH
- EXISTING OPEN WATER FEATURE
- EXISTING WETLANDS
- EXISTING STREAM CENTERLINE
- EXISTING 100 YEAR FLOODPLAIN
- EXISTING PAVED ROAD



REFERENCE

1. AERIAL IMAGERY COURTESY OF MICROSOFT INC. ACCESS OCTOBER 2024.
2. EXISTING CONTOURS DERIVED FROM OKMAPS.ORG, BASED ON LIDAR COLLECTED JULY 24, 2019. ACCESSED OCTOBER 2024.
3. WATER FEATURE DELINEATIONS BASED UPON PRELIMINARY MAPPING PERFORMED BY CEC INC. IN NOVEMBER 2024.
4. FLOODPLAIN REPRESENTS FEMA 100-YEAR FLOOD HAZARD BASED ON FEMA'S NATIONAL FLOOD HAZARD LAYER. ACCESSED DECEMBER 2025.



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CHOCTAW NATION OF OKLAHOMA
 LAKE TALAWANDA SUPPLEMENTAL PHASE II
 FORMER TALAWANDA SHOOTING RANGE
 PITTSBURG COUNTY, OKLAHOMA

TOPOGRAPHIC MAP










DRAWN BY:	NLS	CHECKED BY:	EAS	APPROVED BY:	EAS
DATE:	FEB. 2026	DWG SCALE:	AS SHOWN	PROJECT NO:	352-224

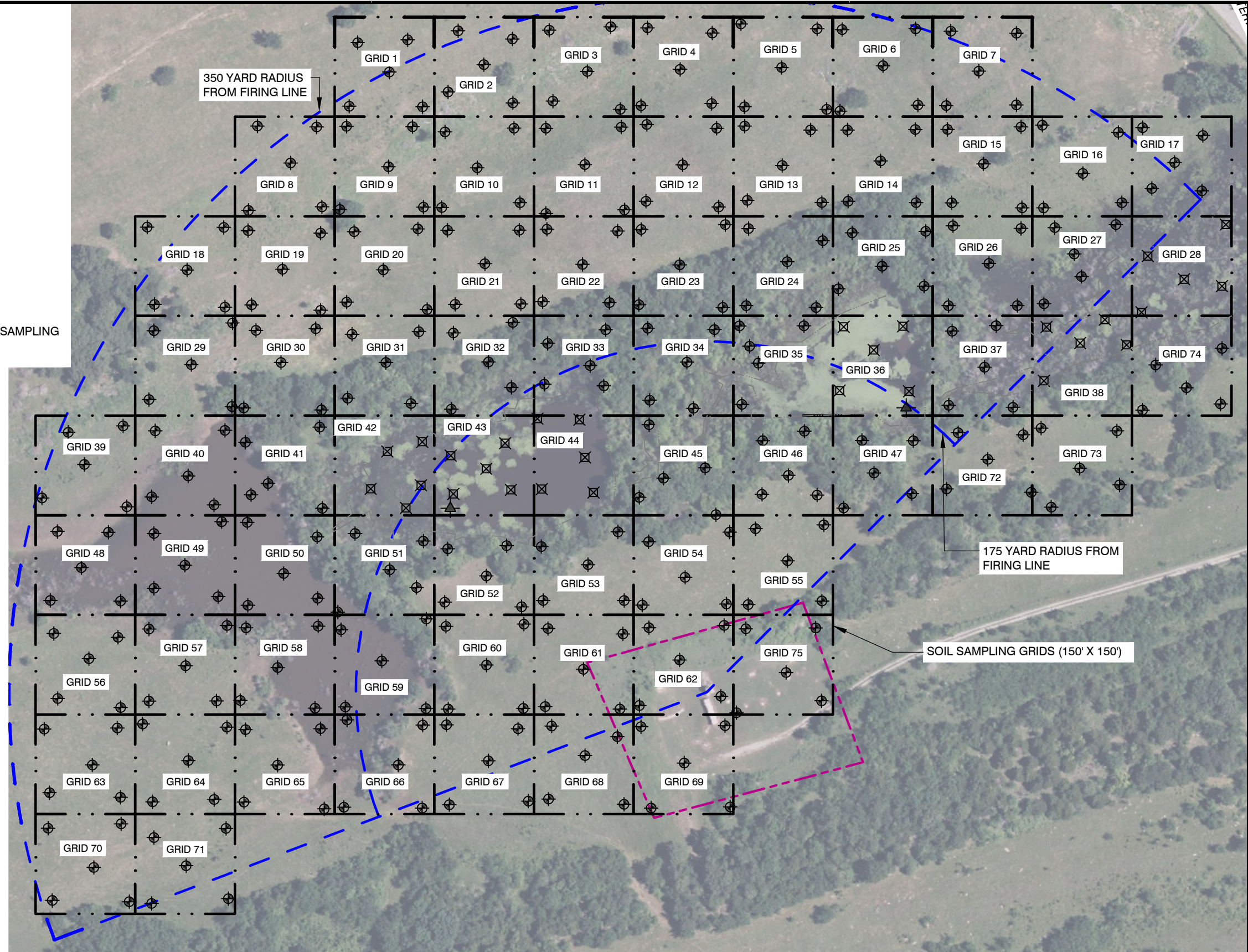
FIGURE 2

F:\350-000\352-224\CADD\Dwg\352224-EV01-Figure 2 Topographic Map.dwg\FIGURE 2.LS:(1/4/2026 - nshepherd) - LP: 2/8/2026 12:51 PM



LEGEND

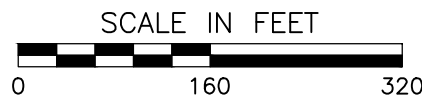
-  FORMER SHOOTING RANGE FACILITIES
-  ESTIMATED RADIUS OF SHOT FALL ZONES
-  SURFACE SOIL SCREENING GRID
-  EXISTING INDEX CONTOUR
-  EXISTING INTERMEDIATE CONTOUR
-  APPROXIMATE EXTENT OF WATERBODIES ON DAY OF SAMPLING
-  SOIL SAMPLING LOCATIONS
-  SEDIMENT DREDGING LOCATIONS
-  SEDIMENT CORING LOCATIONS



F:\350-000\352-224\CADD\Draw\352224-EV01-Figure 3 Sampling Locations.dwg\FIGURE 3 LS:(1/4/2026 - nshepherd) - LP: 2/8/2026 12:52 PM

REFERENCE

1. AERIAL IMAGERY COURTESY OF MICROSOFT INC. ACCESS OCTOBER 2024.
2. EXISTING CONTOURS DERIVED FROM OKMAPS.ORG, BASED ON LIDAR COLLECTED JULY 24, 2019. ACCESSED OCTOBER 2024.



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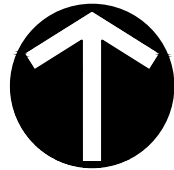
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CHOCTAW NATION OF OKLAHOMA
LAKE TALAWANDA SUPPLEMENTAL PHASE II
FORMER TALAWANDA SHOOTING RANGE
PITTSBURG COUNTY, OKLAHOMA

SITE SAMPLING LOCATIONS

DRAWN BY:	NLS	CHECKED BY:	EAS	APPROVED BY:	EAS
DATE:	FEB. 2026	DWG SCALE:	AS SHOWN	PROJECT NO:	352-224

FIGURE 3



NORTH

LEGEND

- FORMER SHOOTING RANGE FACILITIES
- ESTIMATED RADIUS OF SHOT FALL ZONES
- SURFACE SOIL SCREENING GRID

REPORTING LAYOUT

[DEPTH]: [FIELD SCREENING VALUE] / [LABORATORY VALUE]

EXAMPLE:
 GRID 24 - 0 TO 6 INCH DEPTH:
 FIELD SCREENING: 245 PPM; LABORATORY RESULT: 263 PPM

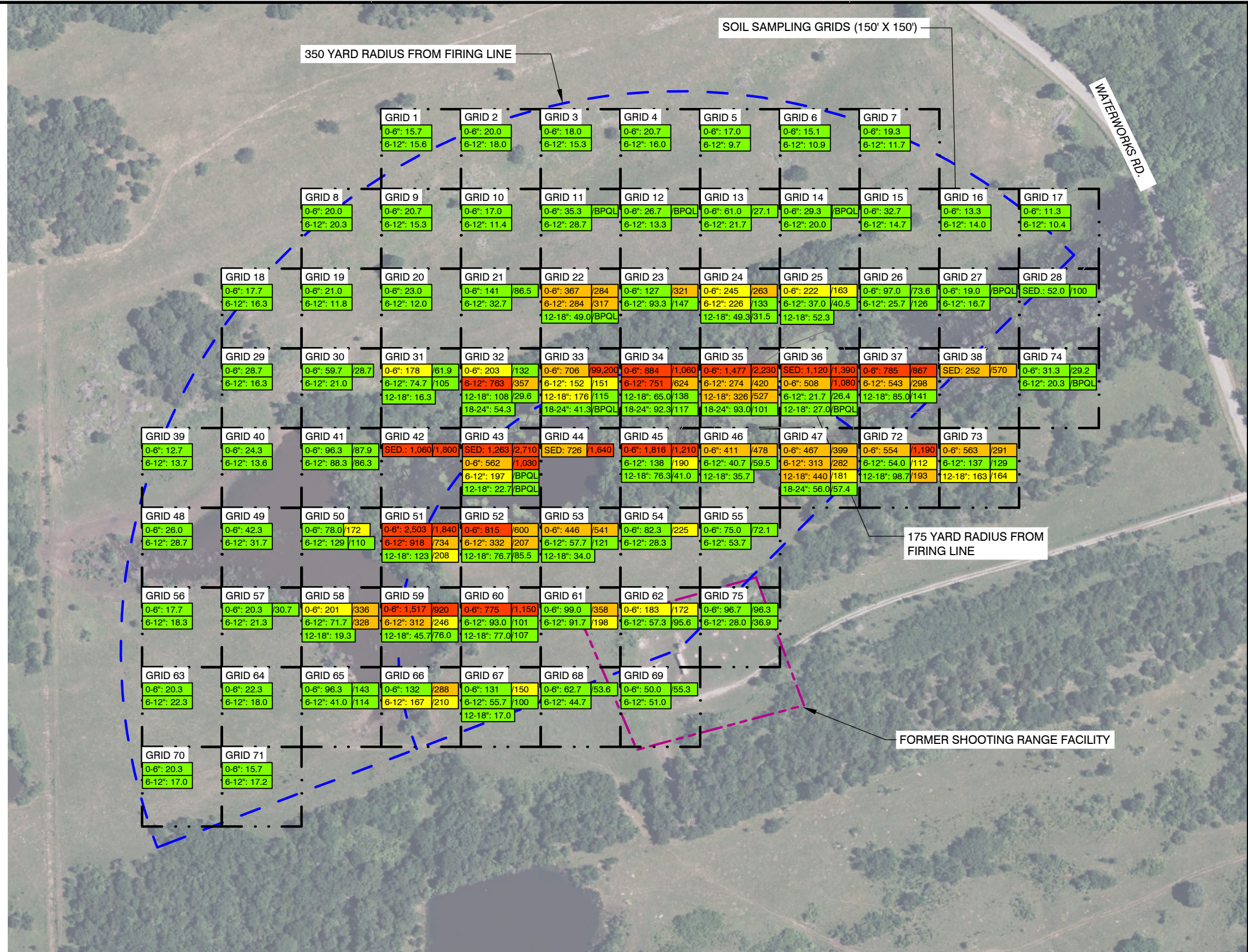
0-6": 245 / 263

COLOR KEY

- VALUES 0-150 PPM [Pb]
- VALUES 150-250 PPM [Pb]
- VALUES 250-750 PPM [Pb]
- VALUES >750 PPM [Pb]

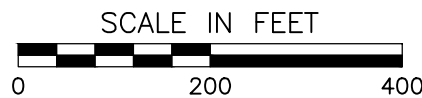
NOTES

- FIELD SCREENING VALUES BASED ON AN AVERAGE OF 3 REPLICATES. GRIDS 28, 36, 38, 42, 43, AND 44 WERE MORE THAN 50% WATER AT THE TIME OF SAMPLING. SEDIMENT SAMPLES FROM THESE GRIDS WERE COLLECTED USING A DREDGE SAMPLER, REPRESENTATIVE OF THE TOP 6-INCHES OF SEDIMENT.
- ADDITIONAL SEDIMENT CORES WERE DRIVEN TO A DEPTH OF 12 TO 18 INCHES IN GRIDS 36 AND 43. THE DEPTH VALUES SHOWN IN THESE GRIDS REPRESENTS THE VALUES FROM THE SEDIMENT CORES.



REFERENCE

- AERIAL IMAGERY COURTESY OF MICROSOFT INC. ACCESS OCTOBER 2024.
- EXISTING CONTOURS DERIVED FROM OKMAPS.ORG, BASED ON LIDAR COLLECTED JULY 24, 2019. ACCESSED OCTOBER 2024.



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CHOCTAW NATION OF OKLAHOMA
 LAKE TALAWANDA SUPPLEMENTAL PHASE II
 FORMER TALAWANDA SHOOTING RANGE
 PITTSBURG COUNTY, OKLAHOMA
**FIELD AND LABORATORY LEAD RESULTS
 FOR SOILS AND SEDIMENTS**

DRAWN BY:	NLS	CHECKED BY:	EAS	APPROVED BY:	EAS
DATE:	FEB. 2026	DWG SCALE:	AS SHOWN	PROJECT NO:	352-224

F:\350-000\352-224\CADD\Dwg\352224-EV01-Figure 4 Sampling Grid Results.dwg\Figure 4 LS(2/1/2026 - nshepherd) - LP: 2/18/2026 12:54 PM

APPENDIX A
FIELD AND LABORATORY LEAD RESULTS FOR SOILS AND SEDIMENTS

Table A1: Field screening and laboratory results for lead concentrations in soils at the former Talawanda Lakes Shooting Range, collected November 2025. Red values indicate lead concentrations greater than 200 mg/kg, the USEPA residential regional screening level.

Grid	Description	Depth	XRF Field Results	Lab Results
			Pb [mg/kg]	Pb [mg/kg]
1	TWSR-G1	0" - 6"	15.7	
		6" - 12"	15.6	
2	TWSR-G2	0" - 6"	20.0	
		6" - 12"	18.0	
3	TWSR-G3	0" - 6"	18.0	
		6" - 12"	15.3	
4	TWSR-G4	0" - 6"	20.7	
		6" - 12"	16.0	
5	TWSR-G5	0" - 6"	17.0	
		6" - 12"	9.7	
6	TWSR-G6	0" - 6"	15.1	
		6" - 12"	10.9	
7	TWSR-G7	0" - 6"	19.3	
		6" - 12"	11.7	
8	TWSR-G8	0" - 6"	20.0	
		6" - 12"	20.3	
9	TWSR-G9	0" - 6"	20.7	
		6" - 12"	15.3	
10	TWSR-G10	0" - 6"	17.0	
		6" - 12"	11.4	
11	TWSR-G11	0" - 6"	35.3	<25.0
		6" - 12"	28.7	
12	TWSR-G12	0" - 6"	26.7	<25.0
		6" - 12"	13.3	
13	TWSR-G13	0" - 6"	61.0	27.1
		6" - 12"	27.7	
14	TWSR-G14	0" - 6"	29.3	<25.0
		6" - 12"	20.0	
15	TWSR-G15	0" - 6"	32.7	
		6" - 12"	14.7	
16	TWSR-G16	0" - 6"	13.3	
		6" - 12"	14.0	
17	TWSR-G17	0" - 6"	11.3	
		6" - 12"	10.4	
18	TWSR-G18	0" - 6"	17.7	
		6" - 12"	16.3	

Table A1 Continued: Field screening and laboratory results for lead concentrations in soils at the former Talawanda Lakes Shooting Range, collected November 2025. Red values indicate lead concentrations greater than 200 mg/kg, the USEPA residential regional screening level.

Grid	Description	Depth	XRF Field Results	Lab Results
			Pb [mg/kg]	Pb [mg/kg]
19	TWSR-G19	0" - 6"	21.0	
		6" - 12"	11.8	
20	TWSR-G20	0" - 6"	23.0	
		6" - 12"	12.0	
21	TWSR-G21	0" - 6"	141	86.5
		6" - 12"	32.7	
22	TWSR-G22	0" - 6"	367	284
		6" - 12"	284	317
		12" - 18"	49.0	<25.0
23	TWSR-G23	0" - 6"	127	321
		6" - 12"	93.3	147
24	TWSR-G24	0" - 6"	245	263
		6" - 12"	226	133
		12" - 18"	49.3	31.5
25	TWSR-G25	0" - 6"	222	163
		6" - 12"	37.0	40.5
		12" - 18"	52.3	
26	TWSR-G26	0" - 6"	97.0	73.6
		6" - 12"	25.7	126
27	TWSR-G27	0" - 6"	19.0	<25.0
		6" - 12"	16.7	
29	TWSR-G29	0" - 6"	28.7	
		6" - 12"	16.3	
30	TWSR-G30	0" - 6"	59.7	28.7
		6" - 12"	21.0	
31	TWSR-G31	0" - 6"	178	61.9
		6" - 12"	74.7	105
		12" - 18"	16.3	
32	TWSR-G32	0" - 6"	203	132
		6" - 12"	763	229
		12" - 18"	108	29.6
		18" - 24"	54.3	
33	TWSR-G33	0" - 6"	706	1220
		6" - 12"	152	151
		12" - 18"	176	115
		18" - 24"	41.3	<25.0

Table A1 Continued: Field screening and laboratory results for lead concentrations in soils at the former Talawanda Lakes Shooting Range, collected November 2025. Red values indicate lead concentrations greater than 200 mg/kg, the USEPA residential regional screening level.

Grid	Description	Depth	XRF Field Results	Lab Results
			Pb [mg/kg]	Pb [mg/kg]
34	TWSR-G34	0" - 6"	884	1060
		6" - 12"	751	624
		12" - 18"	65.0	138
		18" - 24"	92.3	117
35	TWSR-G35	0" - 6"	1477	2230
		6" - 12"	274	420
		12" - 18"	326	527
		18" - 24"	93.0	101
37	TWSR-G37	0" - 6"	785	867
		6" - 12"	543	298
		12" - 18"	85.0	141
		18" - 24"	60.0	
39	TWSR-G39	0" - 6"	12.7	
		6" - 12"	13.7	
40	TWSR-G40	0" - 6"	24.3	
		6" - 12"	13.6	
41	TWSR-G41	0" - 6"	96.3	87.9
		6" - 12"	88.3	86.3
45	TWSR-G45	0" - 6"	1816	1210
		6" - 12"	138	190
		12" - 18"	76.3	41
46	TWSR-G46	0" - 6"	411	478
		6" - 12"	40.7	59.5
		12" - 18"	35.7	
47	TWSR-G47	0" - 6"	467	399
		6" - 12"	313	282
		12" - 18"	440	181
		18" - 24"	56.0	57.4
48	TWSR-G48	0" - 6"	26.0	
		6" - 12"	28.7	
49	TWSR-G49	0" - 6"	42.3	
		6" - 12"	31.7	
50	TWSR-G50	0" - 6"	78.0	172
		6" - 12"	129	110
51	TWSR-G51	0" - 6"	2502	1840
		6" - 12"	918	734
		12" - 18"	123	208
		18" - 24"		206

Table A1 Continued: Field screening and laboratory results for lead concentrations in soils at the former Talawanda Lakes Shooting Range, collected November 2025. Red values indicate lead concentrations greater than 200 mg/kg, the USEPA residential regional screening level.

Grid	Description	Depth	XRF Field Results	Lab Results
			Pb [mg/kg]	Pb [mg/kg]
52	TWSR-G52	0" - 6"	815	600
		6" - 12"	332	207
		12" - 18"	76.7	85.5
53	TWSR-G53	0" - 6"	446	541
		6" - 12"	57.7	121
		12" - 18"	34.0	
54	TWSR-G54	0" - 6"	82.3	205
		6" - 12"	28.3	57.3
55	TWSR-G55	0" - 6"	75.0	72.1
		6" - 12"	53.7	
56	TWSR-G56	0" - 6"	17.7	
		6" - 12"	18.3	
57	TWSR-G57	0" - 6"	20.3	30.7
		6" - 12"	14.7	
58	TWSR-G58	0" - 6"	201	336
		6" - 12"	71.7	81.5
		12" - 18"	19.3	31.3
59	TWSR-G59	0" - 6"	1517	920
		6" - 12"	312	246
		12" - 18"	45.7	76
60	TWSR-G60	0" - 6"	775	1150
		6" - 12"	93.0	101
		12" - 18"	77.0	107
61	TWSR-G61	0" - 6"	99.0	226
		6" - 12"	91.7	95.2
62	TWSR-G62	0" - 6"	183	172
		6" - 12"	57.3	95.6
63	TWSR-G63	0" - 6"	20.3	
		6" - 12"	22.3	
64	TWSR-G64	0" - 6"	22.3	
		6" - 12"	18.0	
65	TWSR-G65	0" - 6"	96.3	143
		6" - 12"	41.0	114
66	TWSR-G66	0" - 6"	132	288
		6" - 12"	167	210
67	TWSR-G67	0" - 6"	131	150
		6" - 12"	55.7	100
		12" - 18"	17.0	

Table A1 Continued: Field screening and laboratory results for lead concentrations in soils at the former Talawanda Lakes Shooting Range, collected November 2025. Red values indicate lead concentrations greater than 200 mg/kg, the USEPA residential regional screening level.

Grid	Description	Depth	XRF Field Results	Lab Results
			Pb [mg/kg]	Pb [mg/kg]
68	TWSR-G68	0" - 6"	62.7	53.6
		6" - 12"	44.7	
69	TWSR-G69	0" - 6"	50.0	55.3
		6" - 12"	51.0	
70	TWSR-G70	0" - 6"	20.3	
		6" - 12"	17.0	
71	TWSR-G71	0" - 6"	15.7	
		6" - 12"	17.2	
72	TWSR-G72	0" - 6"	554	1190
		6" - 12"	54.0	112
		12" - 18"	98.7	193
73	TWSR-G73	0" - 6"	563	291
		6" - 12"	137	129
		12" - 18"	163	164
74	TWSR-G74	0" - 6"	31.3	29.2
		6" - 12"	20.3	<25.0
75	TWSR-G75	0" - 6"	96.7	96.3
		6" - 12"	28.0	36.9

Table A2: Field screening and laboratory results for lead concentrations in sediments at the former Talawanda Lakes Shooting Range, collected November 2025. Red values indicate lead concentrations greater than 200 mg/kg, the USEPA residential regional screening level.

Grid	Description	XRF Field Results	Lab Results
		Pb [mg/kg]	Pb [mg/kg]
28	TWSR-Sed-G28	52	100
36	TWSR-Sed-G36	1120	1390
38	TWSR-Sed-G38	252	570
42	TWSR-Sed-G42	1060	1800
43	TWSR-Sed-G43	1263	2710
44	TWSR-Sed-G44	726	1640

Table A3: Field screening and laboratory results for lead concentrations in sediment cores at the former Talawanda Lakes Shooting Range, collected November 2025. Red values indicate lead concentrations greater than 200 mg/kg, the USEPA residential regional screening level.

Grid	Description	Depth	XRF Field Results	Lab Results
			Pb [mg/kg]	Pb [mg/kg]
43	TWSR-G43-0"-2"	0"-2"	635	
	TWSR-G43-0"-2"	0"-2"	523	
	TWSR-G43-3"-4"	3"-4"	780	1030
	TWSR-G43-5"-6"	5"-6"	309	
	TWSR-G43-6"-7"	6"-7"	315	
	TWSR-G43-8"-9"	8"-9"	255	<25.0
	TWSR-G43-10"-11"	10"-11"	20	
	TWSR-G43-12"-18"	12"-18"	10	
	TWSR-G43-12"-18"	12"-18"	23	<25.0
	TWSR-G43-12"-18"	12"-18"	35	
36	TWSR-G36-1"-2"	1"-2"	750	
	TWSR-G36-3"-4"	3"-4"	715	1080
	TWSR-G36-5"-6"	5"-6"	58	
	TWSR-G36-6"-7"	6"-7"	22	
	TWSR-G36-8"-9"	8"-9"	22	26
	TWSR-G36-10"-11"	10"-11"	21	
	TWSR-G36-12"-18"	12"-18"	26	
	TWSR-G36-12"-18"	12"-18"	39	<25.0
		TWSR-G36-12"-18"	12"-18"	16

Table A4: Laboratory results for lead concentrations in samples collected at the former Talawanda Lakes Shooting Range in November 2025 with their corresponding duplicate.

Sample ID	Pb [mg/kg]	Duplicate ID	Pb [mg/kg]
TWSR-G13: 0" to 6"	27.1	TWSR-G80: 0" to 6"	38.4
TWSR-G23: 6" to 12"	147	TWSR-G81: 6" to 12"	180
TWSR-G27: 0" to 6"	<25.0	TWSR-G82: 0" to 6"	<25.0
TWSR-G32: 6" to 12"	229	TWSR-G84: 6" to 12"	307
TWSR-G33: 12" to 18"	115	TWSR-G85: 12" to 18"	151
TWSR-G37: 6" to 12"	298	TWSR-G83: 6" to 12"	210
TWSR-G46: 6" to 12"	59.5	TWSR-G91: 6" to 12"	73.4
TWSR-G50: 0" to 6"	172	TWSR-G86: 0" to 6"	239
TWSR-G51: 12" to 18"	208	TWSR-G88: 12" to 18"	144
TWSR-G59: 12" to 18"	76	TWSR-G89: 12" to 18"	73.4
TWSR-G61: 0" to 6"	226	TWSR-G90: 0" to 6"	210
TWSR-G66: 6" to 12"	210	TWSR-G87: 6" to 12"	194
TWSR-G74: 6" to 12"	<25.0	TWSR-G92: 6" to 12"	27.2
TWSR-G43: Sed.	2,710	TWSR-G93: Sed.	3,090
TWSR-G43 SC: 0" to 6"	1,030	TWSR-G94 SC: 0" to 6"	848

APPENDIX B
LABORATORY REPORTS



January 05, 2026

Client: CEC Inc.

4700 Gaillardia Parkway, Suite 101

Oklahoma City, OK 73142

Requested By: Nick Shepherd



National
Environmental
Laboratory
Accreditation
Program
ODEQ TNI Certified

Sample Project Name: 352-224 Talawanda Shooting Range

Date Samples Received: December 29, 2025 Time: 9:30 sample temp upon arrival at lab = 8.60°C

Matrix: Soil

Lab Log Numbers: **HL29010-01** **HL29010-02** **HL29010-03**

Work Order: HL29010

Report # HL29010-0105260842

EPA Lab ID#'s: **Stillwater OK00092** **Tulsa OK00983** **OKC OK00129** **ICR OK 001**

Oklahoma Certification: Stillwater NELAP WasteWater, ODEQ 8316/ Drinking Water, DEQ D9602
NELAP Tulsa WasteWater, ODEQ 9905 / Drinking Water, DEQ D9901
Oklahoma City NELAP WasteWater ODEQ 7202 / Drinking Water, DEQ D9937

Kansas Certification: Stillwater NELAP CERT # E-10219

Method Reference: 40 CFR 136, 141, and 261 Methods for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1983. Test Methods for Evaluating Solid Wastes, SW-846, Final Update VI. Standard Methods 2005 (21st Edition), Standard Methods 2011 (22nd Edition), Standard Methods 2017 (23rd Edition) for the Examination of Water and Wastewater.

Analysis Reference: If qualifiers present in "Prep Info" or "Analysis Info", then analysis performed as follows: @= Tulsa Lab and * = OKC Lab. If no qualifiers present, then analysis performed at Stillwater Lab.

Accurate Environmental Laboratories certify that the test results performed meet all requirements of TNI. Any exceptions to this can be found in the report notes, Quality Control section, or Method/Parameter section of the report.

- No cert. = Laboratory does not carry certification for this method/analysis.
- Non-TNI = Laboratory has state certification but method does not fall under TNI certification.

This report is to only be replicated in its entirety.

Revised or Amended reports supersede all previous reports.

Accurate Environmental sampling protocol was followed for any sampling performed by Accurate Field Services.

Field accreditation certification only applies to wastewater analysis. Field analysis for drinking water methods are not offered as part of the ODEQ's field certification program.

Sample: TWSR-G51: 18" to 24"

Location Code:

PWSID#:

Collection Type: Composite Start Date: 11/15/25 10:50

End Date: 11/15/25 10:50

Lab Log# HL29010-01

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Lead (Pb) EPA 6010B	Lead	206 mg/kg dry		25.0	12/30/25 08:10 LF	12/30/25 14:16 LF

Sample: TWSR-G54: 6" to 12"

Location Code:

PWSID#:

Collection Type: Composite Start Date: 11/15/25 15:26

End Date: 11/15/25 15:26

Lab Log# HL29010-02

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Lead (Pb) EPA 6010B	Lead	57.3 mg/kg dry		25.0	12/30/25 08:10 LF	12/30/25 14:20 LF

Sample: TWSR-G58: 12" to 18"

Location Code:

PWSID#:

Collection Type: Composite Start Date: 11/14/25 9:38

End Date: 11/14/25 9:38

Lab Log# HL29010-03

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Lead (Pb) EPA 6010B	Lead	31.3 mg/kg dry		25.0	12/30/25 08:10 LF	12/30/25 14:24 LF

Notes and Definitions

MCL Analyte concentration may exceed Maximum Contaminant Limit (MCL) for EPA Primary or Secondary Drinking Water Regulations.

Analyte concentration may exceed regulatory limit.

PQL Practical Quantitation Limit - the method reporting limit (MRL) adjusted for any dilutions or other changes made to the sample to deal with interferences/matrix effects

BPQL Below Practical Quantitation Limit (if applicable).

The "Prep Date" of the QC analysis coincides with the characters of the appropriate QC Lab ID. (Example: 19 A 02 15 - BLK = 2019, Jan 2, Batch #15 - Blank)

Lab Manager



Quality Control Data**Test results performed meet all method and TNI requirements unless otherwise noted.****Blank Data**

QC Lab #	Test Group	Test	Result	PQL	Flags
25L3008-BLK1	Lead (Pb) EPA 6010B	Lead	BPQL mg/kg dry	25.0	

Laboratory Control Sample Data

Lab QC#	Test Group	Test Name	LCS Result	Spike Level	Units	% Rec.	Control Limits	Flags
25L3008-BS1	Lead (Pb) EPA 6010B	Lead	503	498.5	mg/kg dry	101	85 - 115	

* Complete Entire COC to be in Compliance*

RUSH ^{11/22-25} Due Date



Chain of Custody

Client Name- **CEC Inc.**

Project Name- **352-224 Talawanda Shooting Range**

Sample Preserv. & Container →	Analysis Requested →	Total Metals (Lead Only)							
8oz Amber Glass Jar	# of Container ↓								
	1	X							
	1	X							
	1	X							

Accurate Work Order #	Date Sample Taken	Time Sample Taken	Matrix or Source (Refer below)	Grab (G) or Comp (C)	Client I.D. / Sample Location or DEQ / EPA Location Code	Field Results (pH, Temp, Chlorine, ...) (note analysis & units)			# of Container ↓	Total Metals (Lead Only)
						Time	pH	Temp		
HL29010										
01	11/15/2025	1050	O	C	TWSR-G51: 18" to 24"				1	X
02	11/15/2025	1526	O	C	TWSR-G54: 6" to 12"				1	X
03	11/14/2025	0938	O	C	TWSR-G58: 12" to 18"				1	X

On-Site Info
 Raw Alkalinity (TOC Raw)= _____ mg/L Turbidity (E.Coli)= _____ ntu
 Matrix Codes DW = Drinking Water WW = Wastewater SL = Sludge O = Other Soil _____
 E.Coli Source- GWUDI-FS= Groundwater under direct influence of Flowing Stream GWUDI-RL= Groundwater under direct influence of Reservoir/Lake

Field Instrument Calibration -				
Meter Type	Standards	Final Read.	Date , Time	Initials

Comments -- All samples are scheduled to be disposed of in 4 weeks of receipt at Accurate.--

Certification by Company Official: I hereby certify that the above sampling occurred during a period such that the sample(s) is/are representative of a typical operating day discharge for the above facility. **Signature:** *li huan* **Date/Time:** 12/26/2025 1714

Sampled By: N. Shepherd; T. Montgomery; B. Kinley; D. Dorman **Company:** CEC Inc. **Sample Method:** Composite Soil Samples

Relinquished By: Nick Shepherd	Date/Time	Received By:	Date/Time
Relinquished to Lab By: <i>Nick Shepherd</i>	<i>12/29/2025 0930</i>	Received at Lab By: <i>Hansen Peitler</i>	<i>12-29-25 0930</i>
Relq'd to Log-In Fridge By:		Rec'd °C <i>8.6</i>	

Reporting Requirements (standard 10-15 working days) **Compliance Reporting?** Yes or No (DMR, PWS,) **Oklahoma PWS ID #** **RUSH Request** (if available) (Working Days)

Mail Report: Nick Shepherd **Mail Invoice:** Accounts Payable **Bid # -** _____
Address: 4700 Gaillardia Parkway, Suite 101, Oklahoma City, OK 73142 **Address:** 700 Cherrington Parkway, Moon Township, PA 15108 **PO # -** 352-224
Phone #: (918) 527-6599 **Email:** accountspayable@cecinc.com cc: nshepherd@cecinc.com
Email: nshepherd@cecinc.com

www.accuratelabs.com 505 South Lowry Street Phone: (405) 372-5300 3910 East 51st Street Phone: (918) 663-5400 12036 N. Pennsylvania Phone: (405) 751-3132
 (800) 516-5227 Stillwater, OK 74074 Fax: (405) 372-5396 Tulsa, OK 74135 Fax: (918) 663-6300 Oklahoma City, OK 73120 Fax: (405) 751-3108

Failure to complete this Chain of Custody form correctly may delay turnaround time of analytical reporting.



December 04, 2025

Client: CEC Inc.

4700 Gaillardia Parkway, Suite 101

Oklahoma City, OK 73142

Requested By: Nick Shepherd



National Environmental Laboratory Accreditation Program
ODEQ TNI Certified

Sample Project Name: 352-224 Talawanda Shooting Range

Date Samples Received: November 24, 2025 Time: 13:01 sample temp upon arrival at lab = 2.50°C - On Ice

Matrix: Soil

Lab Log Numbers: **HK24049-01** **HK24049-02** **HK24049-03** **HK24049-04**
 HK24049-05 **HK24049-06**

Work Order: HK24049

Report # HK24049-1204251030

EPA Lab ID#'s: **Stillwater OK00092** **Tulsa OK00983** **OKC OK00129** **ICR OK 001**

Oklahoma Certification: Stillwater NELAP WasteWater, ODEQ 8316/ Drinking Water, DEQ D9602
 NELAP Tulsa WasteWater, ODEQ 9905 / Drinking Water, DEQ D9901
 Oklahoma City NELAP WasteWater ODEQ 7202 / Drinking Water, DEQ D9937

Kansas Certification: Stillwater NELAP CERT # E-10219

Method Reference: 40 CFR 136, 141, and 261 Methods for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1983. Test Methods for Evaluating Solid Wastes, SW-846, Final Update VI. Standard Methods 2005 (21st Edition), Standard Methods 2011 (22nd Edition), Standard Methods 2017 (23rd Edition) for the Examination of Water and Wastewater.

Analysis Reference: If qualifiers present in "Prep Info" or "Analysis Info", then analysis performed as follows: @= Tulsa Lab and * = OKC Lab. If no qualifiers present, then analysis performed at Stillwater Lab.

Accurate Environmental Laboratories certify that the test results performed meet all requirements of TNI. Any exceptions to this can be found in the report notes, Quality Control section, or Method/Parameter section of the report.

- No cert. = Laboratory does not carry certification for this method/analysis.
- Non-TNI = Laboratory has state certification but method does not fall under TNI certification.

This report is to only be replicated in its entirety.

Revised or Amended reports supersede all previous reports.

Accurate Environmental sampling protocol was followed for any sampling performed by Accurate Field Services.

Field accreditation certification only applies to wastewater analysis. Field analysis for drinking water methods are not offered as part of the ODEQ's field certification program.

Sample: TWSR-G51: 0" to 6"

Location Code:

PWSID#:

Collection Type: Composite

Start Date: 11/15/25 10:35

End Date: 11/15/25 10:35

Lab Log# HK24049-01

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
TCLP Arsenic (As) EPA 6020A	Arsenic	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 19:55 RAF
TCLP Barium (Ba) EPA 6020A	Barium	BPQL mg/L		7.50	12/01/25 16:00 RAF	12/02/25 19:55 RAF
TCLP Cadmium (Cd) EPA 6020A	Cadmium	0.015 mg/L		0.010	12/01/25 16:00 RAF	12/02/25 19:55 RAF
TCLP Chromium (Cr) EPA 6020A	Chromium	BPQL mg/L		0.100	12/01/25 16:00 RAF	12/02/25 19:55 RAF
TCLP Lead (Pb) EPA 6020A	Lead	12.4 mg/L	###	0.250	12/01/25 16:00 RAF	12/03/25 16:23 RAF
TCLP Mercury (Hg) EPA 7470A	Mercury	BPQL ug/L		0.20	12/02/25 08:35 LF	12/02/25 14:36 LF
TCLP Selenium (Se) EPA 6020A	Selenium	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 19:55 RAF
TCLP Silver (Ag) EPA 6020A	Silver	BPQL mg/L		0.0200	12/01/25 16:00 RAF	12/02/25 19:55 RAF

Sample: TWSR-G22: 0" to 6"

Location Code:

PWSID#:

Collection Type: Composite

Start Date: 11/10/25 11:46

End Date: 11/10/25 11:46

Lab Log# HK24049-02

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
TCLP Arsenic (As) EPA 6020A	Arsenic	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:03 RAF
TCLP Barium (Ba) EPA 6020A	Barium	BPQL mg/L		7.50	12/01/25 16:00 RAF	12/02/25 20:03 RAF
TCLP Cadmium (Cd) EPA 6020A	Cadmium	BPQL mg/L		0.010	12/01/25 16:00 RAF	12/02/25 20:03 RAF
TCLP Chromium (Cr) EPA 6020A	Chromium	BPQL mg/L		0.100	12/01/25 16:00 RAF	12/02/25 20:03 RAF
TCLP Lead (Pb) EPA 6020A	Lead	1.15 mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:03 RAF
TCLP Mercury (Hg) EPA 7470A	Mercury	BPQL ug/L		0.20	12/02/25 08:35 LF	12/02/25 14:45 LF
TCLP Selenium (Se) EPA 6020A	Selenium	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:03 RAF
TCLP Silver (Ag) EPA 6020A	Silver	BPQL mg/L		0.0200	12/01/25 16:00 RAF	12/02/25 20:03 RAF

Sample: TWSR-G43 Sed.

Location Code:

PWSID#:

Collection Type: Composite

Start Date: 11/4/25 10:05

End Date: 11/4/25 10:05

Lab Log# HK24049-03

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
TCLP Arsenic (As) EPA 6020A	Arsenic	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:11 RAF
TCLP Barium (Ba) EPA 6020A	Barium	BPQL mg/L		7.50	12/01/25 16:00 RAF	12/02/25 20:11 RAF
TCLP Cadmium (Cd) EPA 6020A	Cadmium	BPQL mg/L		0.010	12/01/25 16:00 RAF	12/02/25 20:11 RAF
TCLP Chromium (Cr) EPA 6020A	Chromium	BPQL mg/L		0.100	12/01/25 16:00 RAF	12/02/25 20:11 RAF
TCLP Lead (Pb) EPA 6020A	Lead	9.80 mg/L	###	0.050	12/01/25 16:00 RAF	12/02/25 20:11 RAF
TCLP Mercury (Hg) EPA 7470A	Mercury	BPQL ug/L		0.20	12/02/25 08:35 LF	12/02/25 14:48 LF
TCLP Selenium (Se) EPA 6020A	Selenium	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:11 RAF
TCLP Silver (Ag) EPA 6020A	Silver	BPQL mg/L		0.0200	12/01/25 16:00 RAF	12/02/25 20:11 RAF

Sample: TWSR-G59: 0" to 6"

Location Code:

PWSID#:

Collection Type: Composite

Start Date: 11/15/25 12:55

End Date: 11/15/25 12:55

Lab Log# HK24049-04

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
TCLP Arsenic (As) EPA 6020A	Arsenic	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:19 RAF
TCLP Barium (Ba) EPA 6020A	Barium	BPQL mg/L		7.50	12/01/25 16:00 RAF	12/02/25 20:19 RAF
TCLP Cadmium (Cd) EPA 6020A	Cadmium	BPQL mg/L		0.010	12/01/25 16:00 RAF	12/02/25 20:19 RAF
TCLP Chromium (Cr) EPA 6020A	Chromium	BPQL mg/L		0.100	12/01/25 16:00 RAF	12/02/25 20:19 RAF
TCLP Lead (Pb) EPA 6020A	Lead	5.95 mg/L	###	0.050	12/01/25 16:00 RAF	12/02/25 20:19 RAF
TCLP Mercury (Hg) EPA 7470A	Mercury	BPQL ug/L		0.20	12/02/25 08:35 LF	12/02/25 14:51 LF
TCLP Selenium (Se) EPA 6020A	Selenium	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:19 RAF
TCLP Silver (Ag) EPA 6020A	Silver	BPQL mg/L		0.0200	12/01/25 16:00 RAF	12/02/25 20:19 RAF

Sample: TWSR-G24: 0" to 6"

Location Code:

PWSID#:

Collection Type: Composite

Start Date: 11/10/25 15:44

End Date: 11/10/25 15:44

Lab Log# HK24049-05

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
TCLP Arsenic (As) EPA 6020A	Arsenic	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:51 RAF
TCLP Barium (Ba) EPA 6020A	Barium	BPQL mg/L		7.50	12/01/25 16:00 RAF	12/02/25 20:51 RAF
TCLP Cadmium (Cd) EPA 6020A	Cadmium	BPQL mg/L		0.010	12/01/25 16:00 RAF	12/02/25 20:51 RAF
TCLP Chromium (Cr) EPA 6020A	Chromium	BPQL mg/L		0.100	12/01/25 16:00 RAF	12/02/25 20:51 RAF
TCLP Lead (Pb) EPA 6020A	Lead	3.39 mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:51 RAF
TCLP Mercury (Hg) EPA 7470A	Mercury	BPQL ug/L		0.20	12/02/25 08:35 LF	12/02/25 14:54 LF
TCLP Selenium (Se) EPA 6020A	Selenium	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:51 RAF
TCLP Silver (Ag) EPA 6020A	Silver	BPQL mg/L		0.0200	12/01/25 16:00 RAF	12/02/25 20:51 RAF

Sample: TWSR-G34: 6" to 12"

Location Code:

PWSID#:

Collection Type: Composite

Start Date: 11/12/25 12:26

End Date: 11/12/25 12:26

Lab Log# HK24049-06

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
TCLP Arsenic (As) EPA 6020A	Arsenic	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:59 RAF
TCLP Barium (Ba) EPA 6020A	Barium	BPQL mg/L		7.50	12/01/25 16:00 RAF	12/02/25 20:59 RAF
TCLP Cadmium (Cd) EPA 6020A	Cadmium	BPQL mg/L		0.010	12/01/25 16:00 RAF	12/02/25 20:59 RAF
TCLP Chromium (Cr) EPA 6020A	Chromium	BPQL mg/L		0.100	12/01/25 16:00 RAF	12/02/25 20:59 RAF
TCLP Lead (Pb) EPA 6020A	Lead	1.98 mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:59 RAF
TCLP Mercury (Hg) EPA 7470A	Mercury	BPQL ug/L		0.20	12/02/25 08:35 LF	12/02/25 14:58 LF
TCLP Selenium (Se) EPA 6020A	Selenium	BPQL mg/L		0.050	12/01/25 16:00 RAF	12/02/25 20:59 RAF
TCLP Silver (Ag) EPA 6020A	Silver	BPQL mg/L		0.0200	12/01/25 16:00 RAF	12/02/25 20:59 RAF

Notes and Definitions

MCL Analyte concentration may exceed Maximum Contaminant Limit (MCL) for EPA Primary or Secondary Drinking Water Regulations.

Analyte concentration may exceed regulatory limit.

PQL Practical Quantitation Limit - the method reporting limit (MRL) adjusted for any dilutions or other changes made to the sample to deal with interferences/matrix effects

BPQL Below Practical Quantitation Limit (if applicable).

The "Prep Date" of the QC analysis coincides with the characters of the appropriate QC Lab ID. (Example: 19 A 02 15 - BLK = 2019, Jan 2, Batch #15 - Blank)

Lab Manager

A handwritten signature in black ink on a light gray background. The signature consists of a stylized 'D' followed by 'g' and 'C' followed by a long horizontal flourish.

Blank Data

QC Lab #	Test Group	Test	Result	PQL	Flags
25L0149-BLK1	TCLP Arsenic (As) EPA 6020A	Arsenic	BPQL mg/L	0.005	
25L0149-BLK2	TCLP Arsenic (As) EPA 6020A	Arsenic	BPQL mg/L	0.050	
25L0149-BLK1	TCLP Barium (Ba) EPA 6020A	Barium	BPQL mg/L	0.750	
25L0149-BLK2	TCLP Barium (Ba) EPA 6020A	Barium	BPQL mg/L	7.50	
25L0149-BLK1	TCLP Cadmium (Cd) EPA 6020A	Cadmium	BPQL mg/L	0.001	
25L0149-BLK2	TCLP Cadmium (Cd) EPA 6020A	Cadmium	BPQL mg/L	0.010	
25L0149-BLK1	TCLP Chromium (Cr) EPA 6020A	Chromium	BPQL mg/L	0.010	
25L0149-BLK2	TCLP Chromium (Cr) EPA 6020A	Chromium	BPQL mg/L	0.100	
25L0149-BLK1	TCLP Lead (Pb) EPA 6020A	Lead	BPQL mg/L	0.005	
25L0149-BLK2	TCLP Lead (Pb) EPA 6020A	Lead	BPQL mg/L	0.050	
25L0222-BLK1	TCLP Mercury (Hg) EPA 7470A	Mercury	BPQL ug/L	0.20	
25L0222-BLK2	TCLP Mercury (Hg) EPA 7470A	Mercury	BPQL ug/L	0.20	
25L0149-BLK1	TCLP Selenium (Se) EPA 6020A	Selenium	BPQL mg/L	0.005	
25L0149-BLK2	TCLP Selenium (Se) EPA 6020A	Selenium	BPQL mg/L	0.050	
25L0149-BLK1	TCLP Silver (Ag) EPA 6020A	Silver	BPQL mg/L	0.0020	
25L0149-BLK2	TCLP Silver (Ag) EPA 6020A	Silver	BPQL mg/L	0.0200	

Laboratory Control Sample Data

Lab QC#	Test Group	Test Name	LCS Result	Spike Level	Units	% Rec.	Control Limits	Flags
25L0149-BS1	TCLP Arsenic (As) EPA 6020A	Arsenic	0.098	0.1000	mg/L	98	85 - 115	
25L0149-BS1	TCLP Barium (Ba) EPA 6020A	Barium	0.101	0.1000	mg/L	101	85 - 115	
25L0149-BS1	TCLP Cadmium (Cd) EPA 6020A	Cadmium	0.098	0.1000	mg/L	98	85 - 115	
25L0149-BS1	TCLP Chromium (Cr) EPA 6020A	Chromium	0.098	0.1000	mg/L	98	85 - 115	
25L0149-BS1	TCLP Lead (Pb) EPA 6020A	Lead	0.103	0.1000	mg/L	103	85 - 115	
25L0149-BS1	TCLP Selenium (Se) EPA 6020A	Selenium	0.099	0.1000	mg/L	99	85 - 115	
25L0149-BS1	TCLP Silver (Ag) EPA 6020A	Silver	0.0485	0.05000	mg/L	97	85 - 115	
25L0222-BS1	TCLP Mercury (Hg) EPA 7470A	Mercury	1.7	1.667	ug/L	100	85 - 115	

* Complete Entire COC to be in Compliance*



Chain of Custody

RUSH

Due Date _____

Client Name- **CEC Inc.**
 Project Name- **352-224 Talawanda Shooting Range**

Sample Preserv. & Container →	Analysis Requested →	# of Container ↓	EPA 1311 (TCCLP) (RCRA 8 Metals)						
Plastic Bag									

Accurate Work Order #	Date Sample Taken	Time Sample Taken	Matrix or Source (Refer below)	Grab (G) or Comp (C)	Client I.D. / Sample Location or DEQ / EPA Location Code	Field Results (pH, Temp, Chlorine, ...) (note analysis & units)			Analysis Requested → # of Container ↓	EPA 1311 (TCCLP) (RCRA 8 Metals)						
						Time	pH	Temp								
HK24049																
01	11/15/2025	1035	O	C	TWSR-G51: 0" to 6"				1	X						
02	11/10/2025	1146	O	C	TWSR-G22: 0" to 6"				1	X						
03	11/04/2025	1005	O	C	TWSR-G43 Sed.				1	X						
04	11/15/2025	1255	O	C	TWSR-G59: 0" to 6"				1	X						
05	11/10/2025	1544	O	C	TWSR-G24: 0" to 6"				1	X						
06	11/12/2025	1226	O	C	TWSR-G34: 6" to 12"				1	X						

On-Site Info Raw Alkalinity (TOC Raw)= _____ mg/L Turbidity (E.Coli)= _____ ntu

Matrix Codes DW = Drinking Water WW = Wastewater SL = Sludge O = Other Soil

E.Coli Source- GWUDI-FS= Groundwater under direct influence of Flowing Stream GWUDI-RL= Groundwater under direct influence of Reservoir/Lake

Field Instrument Calibration -

Meter Type	Standards	Final Read.	Date , Time	Initials

Comments -- All samples are scheduled to be disposed of in 4 weeks of receipt at Accurate.--

Include sample pH used to determine extraction fluid as part of report

Certification by Company Official: I hereby certify that the above sampling occurred during a period such that the sample(s) is/are representative of a typical operating day discharge for the above facility.

Signature: *[Signature]* **Date/Time:** 11/24/2025

Sampled By: N. Shepherd; T. Montgomery; B. Kinley; D. Dorman **Company:** CEC Inc. **Sample Method:** Composite Soil Samples

Relinquished By: Nick Shepherd *[Signature]* **Date/Time:** 11-24-2025 1301

Received By: *[Signature]* **Date/Time:** _____

Relinquished to Lab By: **Date/Time:** _____

Relq'd to Log-In Fridge By: **Date/Time:** _____

Received at Lab By: Haven Feltier **Rec'd °C:** 2.5 **Date/Time:** 11-24-25 1301

Reporting Requirements (standard 10-15 working days)	Compliance Reporting? Yes or No (DMR, PWS,)	Oklahoma PWS ID #	RUSH Request (if available) _____ (Working Days)
Mail Report: Nick Shepherd	Mail Invoice: Accounts Payable		Bid # - _____
Address: 4700 Gaillardia Parkway, Suite 101, Oklahoma City, OK 73142 Phone # (918) 527-6599	Address: 700 Cherrington Parkway, Moon Township, PA 15108		PO # - 352-224
Email: nshepherd@cecinc.com	Email: accountspayable@cecinc.com cc' nshepherd@cecinc.com		

www.accuratelabs.com (800) 516-5227	505 South Lowry Street Phone: (405) 372-5300 Stillwater, OK 74074 Fax: (405) 372-5396	3910 East 51 st Street Phone: (918) 663-5400 Tulsa, OK 74135 Fax: (918) 663-6300	12036 N. Pennsylvania Phone: (405) 751-3132 Oklahoma City, OK 73120 Fax: (405) 751-3108
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Failure to complete this Chain of Custody form correctly may delay turnaround time of analytical reporting.

APPENDIX C
STATISTICAL ANALYSIS OUT OF BOOTSTRAPPING SIMULATIONS

Table C.1 Descriptive statistics and results of the bootstrap analysis of the lead concentrations on site before remediation. Statistical analyses were performed in IBM SPSS Software.

			Descriptives					
			Statistic	Std. Error	Bias	Bootstrap ^a		
						Std. Error	95% Confidence Interval	
						Lower	Upper	
Avg_pre	Mean		547.0959	96.64033	2.3980	97.1206	372.4228	750.4930
	95% Confidence Interval for Mean	Lower Bound	352.7875					
		Upper Bound	741.4043					
	5% Trimmed Mean		467.0850		8.8216	94.9368	307.1820	675.4775
	Median		288.0000		-14.8628	70.7997	143.0000	399.0000
	Variance		457628.311		-6621.389	144610.467	200629.476	758862.153
	Std. Deviation		676.48231		-13.73700	108.52620	447.91682	871.12694
	Minimum		25.00					
	Maximum		3090.00					
	Range		3065.00					
	Interquartile Range		806.30		-45.41	259.11	306.40	1140.66
	Skewness		1.833	.340	-.125	.448	.923	2.660
	Kurtosis		3.449	.668	-.645	2.291	-.458	8.383

a. Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples

Table C.2 Descriptive statistics and results of the bootstrap analysis of the lead concentrations on site after remediating the 15 grids with the greatest lead concentrations. Statistical analyses were performed in IBM SPSS Software.

			Descriptives					
			Statistic	Std. Error	Bias	Bootstrap ^a		
						Std. Error	95% Confidence Interval	
						Lower	Upper	
Avg_post3	Mean		153.3816	17.98523	.0556	17.6819	120.1802	189.8895
	95% Confidence Interval for Mean	Lower Bound	117.2199					
		Upper Bound	189.5434					
	5% Trimmed Mean		141.8571		1.2707	18.0877	109.8481	180.6765
	Median		99.0000		1.0645	5.8361	99.0000	105.0000
	Variance		15849.955		-313.533	3827.757	8534.347	23385.707
	Std. Deviation		125.89661		-2.22762	15.57085	92.38153	152.92386
	Minimum		25.00					
	Maximum		541.00					
	Range		516.00					
	Interquartile Range		134.80		3.17	56.85	40.35	237.10
	Skewness		1.360	.340	-.035	.347	.709	2.065
	Kurtosis		1.191	.668	-.054	1.398	-.800	4.560

a. Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples

APPENDIX D
BROWNFIELDS CLEANUP ALTERNATIVES OPINION OF PROBABLE COST
TABLES

Table D1: Brownfields cleanup Alternative #2: Site Access Restriction (Fencing) - opinion of probable cost.

PROJECT: Former Talawanda Lakes Shooing Range Site Investigation
 ALTERNATIVE: Site Access Restriction (Fencing)
 CEC JOB #: 352-224
 CLIENT: Choctaw Nation of Oklahoma
 CREATED BY: NLS
 DATE: 1/19/2026
 CHECKED BY: EAS
 DATE: 2/5/2026



**Civil & Environmental
 Consultants, Inc.**

ITEM NO.	TASK/SERVICE	OPINION OF PROBABLE COST			
		UNITS	QUANTITY	UNIT PRICE	TOTAL
CONSTRUCTION UNIT PRICE ITEMS					
1	6' Chain Link Fence with 3-Strand Barbed Wire Top	LF	4,500	\$ 36.00	\$ 162,000.00
2	6'x18' Aluminum Chain Link Gate with Barbed Wire Top	EA	1	\$ 4,890.00	\$ 4,890.00
3	Warning/No-Trespassing Signs	EA	42	\$ 75.00	\$ 3,150.00
4	As-Built Field Survey	LS	1	\$ 2,590.00	\$ 2,590.00
Fix Cost Sub-Total					\$ 172,630.00
ITEMS BASED ON PERCENTAGE OF OVERALL CONSTRUCTION COST					
Construction Mobilization/Demobilization (15%)					\$ 25,894.50
Contingency (30%)					\$ 51,789.00
TOTAL CONSTRUCTION COST					\$ 250,313.50
Cost Variability for AACE Class V Estimates (-50%)					\$ 125,156.75
Cost Variability for AACE Class V Estimates (+100%)					\$ 500,627.00

NOTES: This estimate is based on quantity values reflective of a 0 to 2% design development stage. The costs are divided into unit costs and percent of overall construction costs. The unit costs are based on materials cost provided by fence manufacturer and a custom sign manufacturer and a 50% installation fee. This estimate is classified as a Class V Estimate according to Association for the Advancement of Cost Engineering International (AACE), with an expected accuracy range of -50% to +100%. However, the actual costs to be incurred will be dependent on the final scope of work required to construct the project as yet to be determined.

Table D2: Brownfields cleanup Alternative #3: Phytoremediation - opinion of probable cost.

PROJECT: Former Talawanda Lakes Shooing Range Site Investigation
 ALTERNATIVE: Phytoremediation
 CEC JOB #: 352-224
 CLIENT: Choctaw Nation of Oklahoma
 CREATED BY: NLS
 DATE: 1/19/2026
 CHECKED BY: EAS
 DATE: 2/5/2026



**Civil & Environmental
 Consultants, Inc.**

ITEM NO.	TASK/SERVICE	OPINION OF PROBABLE COST			
		UNITS	QUANTITY	UNIT PRICE	TOTAL
YEAR 1 COST					
CONSTRUCTION UNIT PRICE ITEMS					
1	6' Chain Link Fence with 3-Strand Barbed Wire Top	LF	4,500	\$ 36.00	\$ 162,000.00
2	6'x18' Aluminum Chain Link Gate with Barbed Wire Top	EA	1	\$ 4,890.00	\$ 4,890.00
3	Warning/No-Trespassing Signs	EA	42	\$ 75.00	\$ 3,150.00
4	As-Built Field Survey	LS	1	\$ 2,590.00	\$ 2,590.00
PHYTOREMEDIATION PLANTING COSTS					
5	Supply and Plant Wetland Plant Species	AC	2.5	\$ 1,259.20	\$ 3,148.00
6	Supply and Plant Upland Plant Species	AC	11.5	\$ 2,500.00	\$ 28,750.00
7	Harvesting of Wetland Plant Species	AC	2.5	\$ 1,259.20	\$ 3,148.00
8	Harvesting of Upland Plant Species	AC	11.5	\$ 2,109.50	\$ 24,259.20
9	Disposal of Harvested Species	TON	27.0	\$ 109.44	\$ 2,955.00
10	Planting of Temporary Cover Crop via Broadcast Seeding	AC	11.5	\$ 1,500.00	\$ 17,250.00
11	Annual Soil Sampling to Evaluate Progress	LS	1	\$ 8,800.00	\$ 8,800.00
Fix Cost Sub-Total					\$ 260,940.20
ITEMS BASED ON PERCENTAGE OF OVERALL CONSTRUCTION COST					
Construction Mobilization/Demobilization (15%)					\$ 39,141.03
Construction Oversight and Field/Laboratory Testing (20%)					\$ 52,188.04
Engineering and Design (25%)					\$ 65,235.05
Contingency (30%)					\$ 78,282.06
TOTAL YEAR 1 COST					\$ 495,786.38
ANNUAL RECURRING COSTS					
ANNUAL RECURRING COST ITEMS					
1	Supply and Plant Wetland Plant Species	AC	2.5	\$ 1,259.20	\$ 3,148.00
2	Supply and Plant Upland Plant Species	AC	11.5	\$ 2,500.00	\$ 28,750.00
3	Harvesting of Wetland Plant Species	AC	2.5	\$ 1,259.20	\$ 3,148.00
4	Harvesting of Upland Plant Species	AC	11.5	\$ 2,109.50	\$ 24,259.20
5	Disposal of Harvested Species	TON	27.0	\$ 109.44	\$ 2,955.00
6	Planting of Temporary Cover Crop via Broadcast Seeding	AC	11.5	\$ 1,500.00	\$ 17,250.00
7	Annual Soil Sampling to Evaluate Progress	LS	1	\$ 8,800.00	\$ 8,800.00
Annual Recurring Cost Sub-Total					\$ 79,510.20
ITEMS BASED ON PERCENTAGE OF OVERALL CONSTRUCTION COST					
Planting and Harvesting Equipment Mobilization/Demobilization (15%)					\$ 11,926.53
Construction Oversight and Field/Laboratory Testing (20%)					\$ 15,902.04
Contingency (30%)					\$ 23,853.06
TOTAL ANNUAL COST					\$ 131,191.83
TOTAL COST FOR REMAINING 19 YEARS AT 3% ANNUAL INFLATION					\$ 3,393,981.77
Cost Variability for AACE Class V Estimates (-50%)					\$ 1,944,884.08
Cost Variability for AACE Class V Estimates (+100%)					\$ 7,779,536.30

NOTES: This estimate is based on quantity values reflective of a 0 to 2% design development stage. The costs are divided into unit costs and percent of overall construction costs. The fence and sign unit costs are based on materials cost provided by fence manufacturer and a custom sign manufacturer and a 50% installation fee. The planting unit costs are based on materials costs from producers with labor and equipment costs based on previous federally funded projects located within the vicinity of this project, with similar revegetation pay items. This estimate is classified as a Class V Estimate according to Association for the Advancement of Cost Engineering International (AACE), with an expected accuracy range of -50% to +100%. However, the actual costs to be incurred will be dependent on the final scope of work required to construct the project as yet to be determined.

Table D3: Brownfields cleanup Alternative #4A: Excavation and Onsite Disposal (Site-Wide Average) - opinion of probable cost.

PROJECT: Former Talawanda Lakes Shooing Range Site Investigation
 ALTERNATIVE: Excavation and Onsite Disposal (Site-Wide Average Volume)
 CEC JOB #: 352-224
 CLIENT: Choctaw Nation of Oklahoma
 CREATED BY: NLS
 DATE: 1/19/2026
 CHECKED BY: EAS
 DATE: 2/5/2026



ITEM NO.	TASK/SERVICE	OPINION OF PROBABLE COST			
		UNITS	QUANTITY	UNIT PRICE	TOTAL
PERMITTING AND CONSTRUCTION PHASE					
1	Cultural Resources Phase I Field Work	AC	10	\$ 1,500.00	\$ 15,000.00
2	Wetland Delineation Field Work	AC	4	\$ 1,500.00	\$ 6,000.00
3	Ecological Reporting and Permitting	LS	1	\$ 65,000.00	\$ 65,000.00
4	Cultural Resources Phase I Reporting	LS	1	\$ 10,000.00	\$ 10,000.00
5	Floodplain Modeling and Permitting	LS	1	\$ 20,000.00	\$ 20,000.00
6	Stormwater Pollution Prevention Plan	LS	1	\$ 2,000.00	\$ 2,000.00
7	Construction Entrance	EA	1	\$ 3,650.00	\$ 3,650.00
8	Erosion Control	LS	1	\$ 25,000.00	\$ 25,000.00
9	Clearing And Grubbing	AC	5	\$ 5,000.00	\$ 25,000.00
10	Dewatering	LS	1	\$ 22,000.00	\$ 22,000.00
11	Excavation and Stockpiling of Material to Create Repository	CY	6,250	\$ 2.75	\$ 17,187.50
12	Excavate, Haul, Place, Compact 24" Clay Liner	CY	1,613	\$ 6.00	\$ 9,680.00
13	Excavate Contaminated Material for Processing	CY	6,250	\$ 2.75	\$ 17,187.50
14	Lead Recovery Processing (weekly Rental)	LS	1	\$ 30,500.00	\$ 30,500.00
15	Lime Amendment	TON	32	\$ 90.00	\$ 2,880.00
16	Placement of Material in Onsite Repository	CY	6,250	\$ 2.75	\$ 17,187.50
17	Excavation and Installation of 24" Clay Cover Layer	CY	1,613	\$ 6.00	\$ 9,680.00
18	Excavation and Installation of 18" Vegetative Topsoil Layer	CY	1,210	\$ 4.18	\$ 5,057.80
19	Final Grading of site to promote drainage	LS	1	\$ 9,000.00	\$ 9,000.00
20	Installation of Bollards to Delineate Capped Area	LS	1	\$ 5,000.00	\$ 5,000.00
21	Supply and Installation of Vegetation Using Hydromulching	AC	8.0	\$ 3,000.00	\$ 24,000.00
22	Supply and Installation of Wetland Seed Mix	AC	2.0	\$ 1,300.00	\$ 2,600.00
23	Live Stakes	AC	8.0	\$ 1,634.40	\$ 13,075.20
24	Field Surveying	LS	1	\$ 20,000.00	\$ 20,000.00
Fix Cost Sub-Total					\$ 376,685.50
ITEMS BASED ON PERCENTAGE OF OVERALL CONSTRUCTION COST					
Construction Mobilization/Demobilization (15%)					\$ 56,502.83
Construction Oversight and Field/Laboratory Testing (20%)					\$ 75,337.10
Bonding (5%)					\$ 18,834.28
Geotechnical Fieldwork and Design (20%)					\$ 75,337.10
Engineering and Design (25%)					\$ 94,171.38
Contingency (50%)					\$ 188,342.75
TOTAL DESIGN AND CONSTRUCTION COST					\$ 885,210.93
Cost Variability for AACE Class V Estimates (-50%)					\$ 442,605.46
Cost Variability for AACE Class V Estimates (+100%)					\$ 1,770,421.85

NOTES: This estimate is based on quantity values reflective of a 0 to 2% design development stage. The costs are divided into unit costs and percent of overall construction costs. The unit costs are based on previous federally funded projects located within the vicinity of this project, with similar pay items. This estimate is classified as a Class V Estimate according to Association for the Advancement of Cost Engineering International (AACE), with an expected accuracy range of -50% to +100%. However, the actual costs to be incurred will be dependent on the final scope of work required to construct the project as yet to be determined.

Table D4: Brownfields cleanup Alternative #4B: Excavation and Onsite Disposal (All Grids <200 mg/kg) - opinion of probable cost.

PROJECT: Former Talawanda Lakes Shooing Range Site Investigation
 ALTERNATIVE: Excavation and Onsite Disposal (All Grids <200 mg/kg)
 CEC JOB #: 352-224
 CLIENT: Choctaw Nation of Oklahoma
 CREATED BY: NLS
 DATE: 1/19/2026
 CHECKED BY: EAS
 DATE: 2/5/2026



ITEM NO.	TASK/SERVICE	OPINION OF PROBABLE COST			
		UNITS	QUANTITY	UNIT PRICE	TOTAL
PERMITTING AND CONSTRUCTION PHASE					
1	Cultural Resources Phase I Field Work	AC	20	\$ 1,500.00	\$ 30,000.00
2	Wetland Delineation Field Work	AC	13	\$ 1,500.00	\$ 19,500.00
3	Ecological Reporting and Permitting	LS	1	\$ 65,000.00	\$ 65,000.00
4	Cultural Resources Phase I Reporting	LS	1	\$ 10,000.00	\$ 10,000.00
5	Floodplain Modeling and Permitting	LS	1	\$ 20,000.00	\$ 20,000.00
6	Stormwater Pollution Prevention Plan	LS	1	\$ 2,000.00	\$ 2,000.00
7	Construction Entrance	EA	1	\$ 3,650.00	\$ 3,650.00
8	Erosion Control	LS	1	\$ 25,000.00	\$ 25,000.00
9	Clearing And Grubbing	AC	5	\$ 5,000.00	\$ 25,000.00
10	Dewatering	LS	1	\$ 22,000.00	\$ 22,000.00
11	Excavation and Stockpiling of Material to Create Repository	CY	16,250	\$ 2.75	\$ 44,687.50
12	Excavate, Haul, Place, Compact 24" Clay Liner	CY	4,840	\$ 6.00	\$ 29,040.00
13	Excavate Contaminated Material for Processing	CY	16,250	\$ 2.75	\$ 44,687.50
14	Lead Recovery Processing (weekly Rental)	LS	1	\$ 50,500.00	\$ 50,500.00
15	Lime Amendment	TON	52	\$ 90.00	\$ 4,680.00
16	Placement of Material in Onsite Repository	CY	16,250	\$ 2.75	\$ 44,687.50
17	Excavation and Installation of 24" Clay Cover Layer	CY	4,840	\$ 6.00	\$ 29,040.00
18	Excavation and Installation of 18" Vegetative Topsoil Layer	CY	3,630	\$ 4.18	\$ 15,173.40
19	Final Grading of site to promote drainage	LS	1	\$ 24,000.00	\$ 24,000.00
20	Installation of Bollards to Delineate Capped Area	LS	1	\$ 5,000.00	\$ 5,000.00
21	Supply and Installation of Vegetation Using Hydromulching	AC	13.0	\$ 3,000.00	\$ 39,000.00
22	Supply and Installation of Wetland Seed Mix	AC	2.5	\$ 1,300.00	\$ 3,250.00
23	Live Stakes	AC	11.5	\$ 1,634.40	\$ 18,795.60
24	Field Surveying	LS	1	\$ 20,000.00	\$ 20,000.00
Fix Cost Sub-Total					\$ 594,691.50
ITEMS BASED ON PERCENTAGE OF OVERALL CONSTRUCTION COST					
Construction Mobilization/Demobilization (15%)					\$ 89,203.73
Construction Oversight and Field/Laboratory Testing (20%)					\$ 118,938.30
Bonding (5%)					\$ 29,734.58
Geotechnical Fieldwork and Design (20%)					\$ 118,938.30
Engineering and Design (25%)					\$ 148,672.88
Contingency (50%)					\$ 297,345.75
TOTAL DESIGN AND CONSTRUCTION COST					\$ 1,397,525.03
Cost Variability for AACE Class V Estimates (-50%)					\$ 698,762.51
Cost Variability for AACE Class V Estimates (+100%)					\$ 2,795,050.05

NOTES: This estimate is based on quantity values reflective of a 0 to 2% design development stage. The costs are divided into unit costs and percent of overall construction costs. The unit costs are based on previous federally funded projects located within the vicinity of this project, with similar pay items. This estimate is classified as a Class V Estimate according to Association for the Advancement of Cost Engineering International (AACE), with an expected accuracy range of -50% to +100%. However, the actual costs to be incurred will be dependent on the final scope of work required to construct the project as yet to be determined.

Table D5: Brownfields cleanup Alternative #5: Excavation and Offsite Disposal (Site-Wide Average) - opinion of probable cost.

PROJECT: Former Talawanda Lakes Shooting Range Site Investigation
 ALTERNATIVE: Excavation and Offsite Disposal (Site-Wide Average Volume)
 CEC JOB #: 352-224
 CLIENT: Choctaw Nation of Oklahoma
 CREATED BY: NLS
 DATE: 1/19/2026
 CHECKED BY: EAS
 DATE: 2/5/2026



**Civil & Environmental
 Consultants, Inc.**

ITEM NO.	TASK/SERVICE	OPINION OF PROBABLE COST			
		UNITS	QUANTITY	UNIT PRICE	TOTAL
PERMITTING AND CONSTRUCTION PHASE					
1	Cultural Resources Phase I Field Work	AC	8.0	\$ 1,500.00	\$ 12,000.00
2	Wetland Delineation Field Work	AC	4.0	\$ 1,500.00	\$ 6,000.00
3	Ecological Reporting and Permitting	LS	1	\$ 65,000.00	\$ 65,000.00
4	Cultural Resources Phase I Reporting	LS	1	\$ 10,000.00	\$ 10,000.00
5	Floodplain Modeling and Permitting	LS	1	\$ 20,000.00	\$ 20,000.00
6	Stormwater Pollution Prevention Plan	LS	1	\$ 2,000.00	\$ 2,000.00
7	Construction Entrance	EA	1	\$ 3,650.00	\$ 3,650.00
8	Erosion Control	LS	1	\$ 25,000.00	\$ 25,000.00
9	Clearing And Grubbing	AC	5	\$ 5,000.00	\$ 25,000.00
10	Excavate and Load Contaminated Material	CY	6,250	\$ 2.75	\$ 17,187.50
11	Hauling Contaminated Material to Solid Waste Landfill	LOAD	651	\$ 195.00	\$ 126,953.13
12	Final Grading of site to promote drainage	LS	1	\$ 9,000.00	\$ 9,000.00
13	Supply and Installation of Vegetation Using Hydromulching	AC	8.0	\$ 3,000.00	\$ 24,000.00
14	Supply and Installation of Wetland Seed Mix	AC	2.0	\$ 1,300.00	\$ 2,600.00
15	Live Stakes	AC	8.0	\$ 560.00	\$ 4,480.00
16	Field Surveying	LS	1	\$ 20,000.00	\$ 20,000.00
17	Lime Amendment (optional pay item to stabilize soil)	TON	28	\$ 90.00	\$ 2,520.00
Fix Cost Sub-Total					\$ 375,390.63
ITEMS BASED ON PERCENTAGE OF OVERALL CONSTRUCTION COST					
Construction Mobilization/Demobilization (15%)					\$ 56,308.59
Construction Oversight (25%)					\$ 93,847.66
Bonding (5%)					\$ 18,769.53
Engineering and Design (20%)					\$ 75,078.13
Contingency (50%)					\$ 187,695.31
LANDFILL FEES					
18	Solid Waste Landfill Tipping Fees	TON	6,250	\$ 95.00	\$ 593,750.00
TOTAL DESIGN AND CONSTRUCTION COST					\$ 1,400,839.84
Cost Variability for AACE Class V Estimates (-50%)					\$ 700,419.92
Cost Variability for AACE Class V Estimates (+100%)					\$ 2,801,679.69

NOTES: This estimate is based on quantity values reflective of a 0 to 2% design development stage. The costs are divided into unit costs and percent of overall construction costs. The unit costs are based on previous federally funded projects located within the vicinity of this project, with similar pay items. The tipping fee cost was provided by Republic Services Landfill, located near Alderson, OK, via phone call on November 27, 2024. This estimate is classified as a Class V Estimate according to Association for the Advancement of Cost Engineering International (AACE), with an expected accuracy range of -50% to +100%. However, the actual costs to be incurred will be dependent on the final scope of work required to construct the project as yet to be determined.

Table D6: Brownfields cleanup Alternative #5: Excavation and Offsite Disposal (All Grids <200 mg/kg) - opinion of probable cost.

PROJECT: Former Talawanda Lakes Shooting Range Site Investigation
 ALTERNATIVE: Excavation and Offsite Disposal (All Grids <200 mg/kg)
 CEC JOB #: 352-224
 CLIENT: Choctaw Nation of Oklahoma
 CREATED BY: NLS
 DATE: 1/19/2026
 CHECKED BY: EAS
 DATE: 2/5/2026



**Civil & Environmental
 Consultants, Inc.**

ITEM NO.	TASK/SERVICE	OPINION OF PROBABLE COST			
		UNITS	QUANTITY	UNIT PRICE	TOTAL
PERMITTING AND CONSTRUCTION PHASE					
1	Cultural Resources Phase I Field Work	AC	20	\$ 1,500.00	\$ 30,000.00
2	Wetland Delineation Field Work	AC	13	\$ 1,500.00	\$ 19,500.00
3	Ecological Reporting and Permitting	LS	1	\$ 65,000.00	\$ 65,000.00
4	Cultural Resources Phase I Reporting	LS	1	\$ 10,000.00	\$ 10,000.00
5	Floodplain Modeling and Permitting	LS	1	\$ 20,000.00	\$ 20,000.00
6	Stormwater Pollution Prevention Plan	LS	1	\$ 2,000.00	\$ 2,000.00
7	Construction Entrance	EA	1	\$ 3,650.00	\$ 3,650.00
8	Erosion Control	LS	1	\$ 25,000.00	\$ 25,000.00
9	Clearing And Grubbing	AC	5	\$ 5,000.00	\$ 25,000.00
10	Excavate and Load Contaminated Material	CY	16,250	\$ 2.75	\$ 44,687.50
11	Hauling Contaminated Material to Solid Waste Landfill	LOAD	1,693	\$ 195.00	\$ 330,078.13
12	Final Grading of site to promote drainage	LS	1	\$ 24,000.00	\$ 24,000.00
13	Supply and Installation of Vegetation Using Hydromulching	AC	11.5	\$ 3,000.00	\$ 34,500.00
14	Supply and Installation of Wetland Seed Mix	AC	2.5	\$ 1,300.00	\$ 3,250.00
15	Live Stakes	AC	11.5	\$ 560.00	\$ 6,440.00
16	Field Surveying	LS	1	\$ 20,000.00	\$ 20,000.00
17	Lime Amendment (optional pay item to stabilize soil)	TON	52	\$ 90.00	\$ 4,680.00
Fix Cost Sub-Total					\$ 667,785.63
ITEMS BASED ON PERCENTAGE OF OVERALL CONSTRUCTION COST					
Construction Mobilization/Demobilization (15%)					\$ 100,167.84
Construction Oversight (25%)					\$ 166,946.41
Bonding (5%)					\$ 33,389.28
Engineering and Design (20%)					\$ 133,557.13
Contingency (50%)					\$ 333,892.81
LANDFILL FEES					
18	Solid Waste Landfill Tipping Fees	TON	16,250	\$ 95.00	\$ 1,543,750.00
TOTAL DESIGN AND CONSTRUCTION COST					\$ 2,979,489.09
Cost Variability for AACE Class V Estimates (-50%)					\$ 1,489,744.55
Cost Variability for AACE Class V Estimates (+100%)					\$ 5,958,978.19

NOTES: This estimate is based on quantity values reflective of a 0 to 2% design development stage. The costs are divided into unit costs and percent of overall construction costs. The unit costs are based on previous federally funded projects located within the vicinity of this project, with similar pay items. The tipping fee cost was provided by Republic Services Landfill, located near Alderson, OK, via phone call on November 27, 2024. This estimate is classified as a Class V Estimate according to Association for the Advancement of Cost Engineering International (AACE), with an expected accuracy range of -50% to +100%. However, the actual costs to be incurred will be dependent on the final scope of work required to construct the project as yet to be determined.