

TARGETED BROWNFIELD ASSESSMENT

For

Oklahoma Army National Guard
Former Tahlequah Armory
Tahlequah, Oklahoma

ASTM E 1527-05
Phase I Environmental Site Assessment
All Appropriate Inquiry

Prepared by:



July 8, 2013

Prepared for:

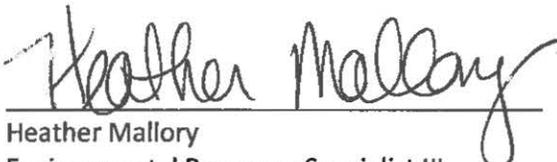
City of Tahlequah
111 S. Cherokee Ave.
Tahlequah, OK 74464

Prepared by:

Oklahoma Department of Environmental Quality
Land Protection Division
707 N. Robinson
P.O. Box 1677
Oklahoma City, Oklahoma 73101-1677

I declare that to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR 312. I have specific qualifications based on education training, and experience to assess a property of the nature, history and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Environmental Professionals in charge of the project:


Heather Mallory
Environmental Programs Specialist III

Other Environmental Scientist working on the project:


Rachel Francks
Environmental Programs Specialist II

Table of Contents

1.0	Executive Summary	5
2.0	Introduction	7
	2.1 Purpose	7
	2.2 Detailed Scope-of-services	7
	2.3 Significant Assumptions	7
	2.4 Limitations and Exceptions	8
	2.5 Special Terms and Conditions	8
3.0	Site Characterization and History	9
	3.1 Location and Legal Description	9
	3.2 Site and Vicinity Characterization	9
	3.3 Descriptions of Structures, Roads and Other Improvements	10
	3.4 Owner, Property Manager, and Occupant Information	10
	3.5 Information Reported by User Regarding Environmental Lien or Specialized Knowledge or Experience	10
	3.6 Commonly Known or Reasonable Ascertainable Information	10
	3.7 Valuation Reduction for Environmental Issues	10
	3.8 Current Use of Property	11
	3.9 Past Use of Property	11
	3.9.1 Review of Aerial Photos	11
	3.9.2 Fire Insurance Maps	13
	3.9.3 Historical Topographic Maps	13
	3.10 Current and Past Use of Adjoining Properties	14
	3.11 Environmental (Physical) Setting	14
	3.11.1 Surface Water Characteristics	14
	3.11.2 Subsurface Geological Characteristics	15
	3.11.3 Ground Water Characteristics	15
	3.11.4 Air Characteristics	16
4.0	Records Review	17
	4.1 Federal National Priorities List (NPL)	17
	4.2 Federal CERCLIS List	17
	4.3 Federal RCRA CORRACTs List	17
	4.4 Federal RCRA non-CORRACTS TSD List	17
	4.5 Federal RCRA Generators List	18
	4.6 Federal ERNS List	18
	4.7 Federal Institutional Control/Engineering Control Registries	18
	4.8 State-Equivalent NPL	18
	4.9 State-Equivalent CERCLIS	18
	4.10 State Landfill and/or Solid Waste Disposal Sites	18
	4.11 State Leaking UST List	18
	4.12 State Registered UST Sites	19
	4.13 State Institutional Control/Engineering Control Registries	19
	4.14 State Voluntary Cleanup Sites	19
	4.15 State Brownfield Sites	19
	4.16 Oil and Gas Records	19
	4.17 Dry Cleaners	20
5.0	Site Reconnaissance and Interviews	21
	5.1 Methodology and Limiting Conditions	21

5.2	General Site Conditions	21
5.2.1	Above Ground Storage Tanks (ASTs)	21
5.2.2	Landfills and/or Dumping	21
5.2.3	Impoundments	21
5.2.4	Monitoring Wells	22
5.2.5	Disturbed and Stained Soil	22
5.2.6	Seeps	22
5.2.7	Chemical Spills	22
5.2.8	Farm Waste	22
5.2.9	Known Pesticide Misapplication	22
5.2.10	Discharges and Runoff from Adjacent Property Affecting the Site	22
5.2.11	Petroleum Products and Oil and Natural Gas Exploration	23
5.2.12	Asbestos	23
5.2.13	Lead	23
5.2.14	Transformers/PCB Equipment	24
5.3	External Observations	24
5.4	Internal Observations	24
5.5	Interviews	24
6.0	Findings	25
7.0	Opinion and Recommendations	26
8.0	Data Gaps	26
9.0	Conclusions	26
10.0	Additional Services	26
11.0	Deviations	26
12.0	References	27
	Appendices	
	A. Qualifications of Environmental Professionals	
	B. Photographs from site visit/Site notes	
	C. Aerial Photographs	
	D. FEMA Flood Zone Map	
	E. Sanborn Map	
	F. USGS Topographical Map / Site Maps	
	G. Deeds	
	H. ERNS Records for Tahlequah, OK	
	I. Historical Topographic Maps	
	J. RCRA Records for Tahlequah, OK	
	K. Underground Storage Tank Removal Documents	
	L. Oklahoma Corporation Commission UST records	
	M. Oklahoma Water Resource Board Water Wells	
	N. Air Quality Permitted Facilities	
	O. Memorandum of Agreement between Oklahoma Department of Environmental Quality and the City of Tahlequah	
	P. Oklahoma Military Department Environmental Office Records for Tahlequah Armory, 100 S. Phoenix Ave., Tahlequah, OK.	
	Q. Sampling Documents	
	R. Asbestos and Lead Based Paint Reports	
	Background and Disclaimer	

1.0 Executive Summary

On June 21, 2012, Rachel Francks and Alisha Grayson of the Oklahoma Department of Environmental Quality (DEQ) performed site reconnaissance of the former Tahlequah National Guard Armory located at 100 Phoenix Ave., Tahlequah, Cherokee County, Oklahoma, as part of a Targeted Brownfield Assessment (TBA). The subject property is situated to the west of the City of Tahlequah and is in a light industrial and park area that includes baseball fields and light industrial businesses. The purpose of the TBA was to identify potential environmental concerns by reviewing historical data, regulatory information, and by performing a visual inspection of the site and surrounding area. The following is an executive summary of the environmental site assessment results:

- Lead dust, lead-based paint, and asbestos were cleaned up on April 9, 2013 in the former Tahlequah National Guard Armory by the Oklahoma Department of Environmental Quality's (DEQ) Site Cleanup Assistance Program (SCAP). Since lead dust, lead-based paint, and asbestos contamination have been removed from the building, they are considered historical recognized environmental conditions (HRECs).
- The former Tahlequah National Guard Armory was built in 1982. The property was managed and maintained by the Oklahoma Military Department (OMD) on behalf of the State of Oklahoma. Ownership of the subject property has been transferred to City of Tahlequah as of March 8, 2012. The City of Tahlequah is currently working on clean up and development of the site for use by the City of Tahlequah Police Department. Once cleanup activities have occurred, the City of Tahlequah Police Department will begin occupying the building.
- There is one building on the site. The building holds offices and class rooms which surround the firing range and the drill floor. At the time of the site visit by Francks and Grayson, all equipment has been removed, with the exception of heating and cooling units and the water heater and a number of items that were left in the firing range. There was a damaged thermostat in the drill floor area that contains mercury. The glass container of the mercury switch was damaged, though the mercury still seems to be contained in the tube.
- Historical recognized environmental conditions (HRECs) include containers of hazardous waste and mercury, which were addressed by DEQ and/or its contractors.
- Adjoining properties consist of; an automotive repair shop to the north; Homelite Outdoor Power Equipment, a small machine manufactory and Comb in the Chrome, a car detailing shop to the east; baseball fields to the south; storage units and a café to the west. Historical aerial photographs beginning in 1938 show the subject property as farm land and unoccupied land. Aerial photos from 1995 – 2010 show the area around the location to be occupied by the current buildings and the armory.
- The property is located to the west of Tahlequah outside of historical city boundaries, so Sanborn Fire Insurance maps do not show the subject property.

- No National Priority List (NPL), delisted NPL sites, Resource Conservation and Recovery Act (RCRA) non-corrective action sites (CORRACTS) treatment, storage, and disposal (TSD) listings, Emergency Response Notification System (ERNS) list, Institutional Controls/Engineering Controls, or State landfills and/or solid waste disposal sites were found on the subject property or within the ASTM recommended search radii. No RCRA generators, Voluntary Cleanup (VCP) sites, or Brownfield sites were found on the subject property. There were no archived Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) site listings within a ½ mile of the subject property.
- There was one underground storage tank (UST) on site. It had a 6,000 gallon capacity and was used to store gasoline. The tank was removed in 1993 and the case was closed with the Oklahoma Corporation Commission (OCC). At the time of removal the soil below the tank and to the side were tested for Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) and total petroleum hydrocarbons (TPH). The results showed all tested contaminants to be below detection limits except for Xylenes which was detected at 0.042 mg/L, which is below OCC action levels. When pulled, the tank was in good condition with no holes. The tank pit was filled with clean soil. There was no sign of the UST or soil staining and the pump island had been removed as well. The UST is considered an HREC.
- Oil and gas exploration was searched in the OCC oil and gas records on the adjoining properties. There was no record of oil and gas production on the subject property or any adjoining sites.
- Transformers were noted to the north east and south east of the armory, they are off the property and it is unknown if it contains polychlorinated biphenyls (PCBs), but the units appear new and in good condition. Fluorescent lighting ballasts are located throughout the offices in the building. The lighting ballasts are all in good condition in most rooms. The lights in the drill floor and the garage are halogen bulbs. All fluorescent bulbs contain mercury and should be handled as Universal Waste unless documentation and/or sampling demonstrate they are not hazardous.

2.0 Introduction

The State of Oklahoma Department of Environmental Quality (DEQ) under a Brownfield Assistance Agreement (No. RP96681001-0) (Ref. 1) with the U.S. Environmental Protection Agency (EPA) conducted a Targeted Brownfield Assessment of a property located at 100 Phoenix Ave., Tahlequah, Cherokee County, Oklahoma.

2.1 Purpose

The purpose of this assessment is to look at the environmental conditions within the target area and provide this information to the City of Tahlequah as well as meet the All Appropriate Inquiry requirement of the landowner liability protections under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, better known as Superfund – Ref. 2), as provided in the Small Business Relief and Brownfield’s Revitalization Act of 2002 (Public Law 107-118, Subtitle B – Ref. 3). The purpose of a Phase I Environmental Site Assessment is to identify, to the extent feasible, recognized environmental conditions in connection with the target property through a systematic review of readily available information sources and a site reconnaissance.

DEQ is providing technical assistance to the project by evaluating the environmental condition of the property prior to the City of Tahlequah converting the armory for use by the City of Tahlequah Police. Funding for this assessment has been provided by the U.S. Environmental Protection Agency (EPA).

2.2 Detailed Scope of Services

DEQ examined the current use of the property and identified the historical uses of the property to determine if recognized environmental conditions exist. DEQ examined historical documents, governmental databases, oil and gas records, aerial photographs, Sanborn Fire Insurance Maps, and conducted interviews and a site reconnaissance of the area. A good faith effort was made to identify possible environmental conditions that might affect the development of the property.

2.3 Significant Assumptions

History and knowledge of the subject property shows that the building was used as a National Guard Armory. Prior to armory construction in 1982, the property was farmland. There has been no oil and gas exploration on the property according to OCC records.

Since the building was constructed in 1982, the building is unlikely to contain ACM. The U.S. began banning the use of asbestos in most building materials in the 1970s due to studies confirming the harmful health effects caused by exposure to airborne asbestos.

Floor, ceiling, and wall tiles as well as window caulking and insulation observed in the building during the site reconnaissance conducted on June 21, 2011, are not similar to products suspected to contain asbestos. DEQ had a lead and asbestos survey conducted on the property.

2.4 Limitations and Exceptions

The purpose of an environmental site assessment is to identify actual or potential “recognized environmental conditions” that may result in liability, land use restrictions, or cause delays in revitalization. The ASTM Phase I Environmental Site Assessment E 1527 – 05 (Ref. 4) is the minimum standard for environmental due diligence in the real estate industry and meets the standard for All Appropriate Inquiry under the Small Business Liability Relief and Brownfields Revitalization Act of 2002. A diligent effort in accordance with generally accepted good commercial and customary standards and practices was undertaken to identify the “recognized environmental conditions” that might affect the revitalization project. However, the identification of old hazardous waste sites is an evolving process; therefore, DEQ cannot state with absolute certainty that no other potential hazardous waste sites are located in the area. This assessment was conducted under constraints of time, cost, and scope and reflects a limited investigation and evaluation. It reflects the normal degree of care and skill that is ordinarily exercised by environmental professionals conducting business in this or similar localities. In no event shall the DEQ or its employees be liable for any damages, injury, loss, cost or expense whatsoever arising in connection with the use or reliance on the information contained in this report, except as otherwise provided by law.

The information in this report is based on a review of governmental records, interviews with knowledgeable representatives of the property, information provided by the City of Tahlequah, and observations of the environmental professional. The result of this assessment, as written in this report, is valid as of the date of report. The assessment does not include sampling of rock, groundwater, surface water, or air. For qualifications of environmental professionals see Appendix A.

2.5 Special Terms and Conditions

This assessment report has been prepared for the City of Tahlequah by the DEQ using EPA funding. Information about this report will be provided to the EPA for its files. This report and the working file are public record and subject to the Oklahoma Open Records Act and the federal Freedom of Information Act.

3.0 Site Characterization and History

3.1 Location and Legal Description

The subject property is located at 100 Phoenix Ave. in Tahlequah, Oklahoma. This property consists of approximately eight acres of land and contains the former National Guard Armory building. A site map and topographical map depicting the property have been provided in Appendix F.

The subject property is bisected by the section line between Section 30, T17N, R22E, Cherokee County, Oklahoma. The armory building's legal description is:

All that part of the SW4 of NW4 of SE4 of Section 30, Township 17 North, Range 22 East, lying South of State Highway No. 51, more particularly described as: Beginning at the Southeast Corner of said SW4 NW4 SE4 of Section 30; thence West 660.1 feet; thence North 445.7 feet; thence easterly along the south border of State Highway no. 51, 674.4 feet; thence South 312.85 feet, along the West border of the county road to the Point of Beginning;

3.2 Site and Vicinity Characterization

The former Tahlequah Armory was built in 1982. According to Cherokee County land records, the land for the building was owned by the City of Tahlequah and was deeded to the State of Oklahoma for the construction of the Oklahoma National Guard on March 25, 1980 (see Appendix G). The subject property is a tract of land about 8 acres in size, and is located at 100 Phoenix Ave., Tahlequah, Oklahoma. It is bounded by W. Choctaw St./Hwy 51 on the north and S. Phoenix Ave. on the east. The areas where the subject property and adjacent properties are located are best characterized by light industrial and a park. A restaurant and storage units are to the west, small equipment manufacturer, automotive repair, and a chrome and detailing shop to the east, undeveloped land to the north, and baseball fields and a trailer park to the south.

Utilities that serve the subject property are Lake Region Electric Co-op (LREC) for electricity, North East Public Facilities Authority (NEPFA) for gas service, and the Tahlequah Public Works Authority provides water and sewer services to the armory according to Mark Manship (City of Tahlequah employee).

A review of the topographical map indicated that the surface elevation of the site is approximately 875 feet above mean sea level. The topographical gradient is to the north, toward Pecan Creek. Pecan Creek is located approximately 0.25 miles from the site to the north. The topographical map can be found in Appendix F.

3.3 Description of Structures, Roads, and Other Improvements

The structure of the armory has some wear. The floor has cracks between the foundation and the walls. Additionally, the roof was observed leaking inside the building. Yellow mastic was noted in areas where tiles have been removed and under some remaining damaged tiles. Windows were in good condition at the Armory and do not appear to have asbestos caulking. Roads surrounding the Armory and the front parking lot are paved with minimal wear. The rear parking area is surrounded by chain link fence and is asphalted. The yards surrounding the armory are well maintained and no distressed vegetation was noted. Adjacent property buildings consist of commercial and light industrial business. Throughout the facility, there are floor drains. Mark Manship, City of Tahlequah employee, indicated that to the best of local knowledge these drains should lead into the city sanitary sewage pipes, but it is known that the armory had sanitary lagoons as recently as 1995, so it is uncertain where the lines may lead.

3.4 Owner, Property Manager, and Occupant Information

The subject property is owned by the City of Tahlequah and is currently unoccupied. DEQ SCAP is in charge of identifying environmental hazards and conducted the cleanup of the Armory on April 9, 2013. The Military department transferred ownership of the armory to the City of Tahlequah prior to completion of remedial activities (Appendix O).

3.5 Information Reported by User Regarding Environmental Lien or Specialized Knowledge or Experience

The property owner and/or representatives reported no environmental liens on the subject property, and had no specialized knowledge or experience regarding recognized environmental conditions. The DEQ conducted a search for environmental liens at the Cherokee County Courthouse. No environmental liens or use limitations were reported for the subject property, and it does not appear in the Brownfield IC database.

3.6 Commonly Known or Reasonably Ascertainable Information

Mark Manship, City of Tahlequah employee, who was instructed to meet Francks at the Armory, had limited knowledge about the site. It is known within the community that the building functioned as a National Guard Armory.

3.7 Valuation Reduction for Environmental Issues

Valuation of the property is outside the scope of this assessment. A professional appraiser should be consulted to place a value on the property.

3.8 Current Use of the Property

The property is currently unoccupied.

3.9 Past Use of the Property

3.9.1 Review of Aerial Photographs

Historic aerial photographs were searched to view the changes to the property over time. The 1938 aerial photograph was found at the Oklahoma Department of Libraries. The aerial photographs from 1995, 2003, 2005, 2006, 2008, 2010, and 2012 were found on Google Earth. Aerial photographs from 1938, 1995, 2003, 2005 and 2006, 2008, 2010, and 2012 were obtained. All these photographs are located in Appendix C. The following represents a summary of what was found at the subject property from each photograph.

1938 aerial photograph

The 1938 aerial photograph shows the subject property and all adjacent properties to be in agricultural use.

1995 aerial photograph

The 1995 aerial photograph shows the subject property with the Armory. Two lagoons are visible on the western side of the property. Baseball fields are visible to the south. The storage units are visible to the west. The buildings to the east that currently house small machine manufacturing and a vehicle detailing shop and the building to the north that currently houses automotive repair are visible.

2003 aerial photograph

The 2003 aerial photograph shows the subject property with the Armory. The footprint of the two lagoons is visible on the western side of the property. Baseball fields are visible to the south. The storage units and the building that currently houses a restaurant are visible to the west. The buildings to the east that currently house small machine manufacturing and a vehicle detailing shop and the building to the north that currently houses automotive repair are visible.

2005 aerial photograph

The 2005 aerial photograph shows the subject property with the Armory. The footprint of the two lagoons is no longer visible on the western side of the property. Baseball fields are visible to the south. The storage units and the building that currently houses a restaurant are visible to the west. The buildings to the east that currently house small machine manufacturing and a vehicle detailing shop and the building to the north that currently houses automotive repair are visible.

2006 aerial photograph

The 2006 aerial photograph shows the subject property with the Armory. Baseball fields are visible to the south. The storage units and the building that currently houses a restaurant are visible to the west. The buildings to the east that currently house small machine manufacturing and a vehicle detailing shop and the building to the north that currently houses automotive repair are visible.

2008 aerial photograph

The 2008 aerial photograph shows the subject property with the Armory. Baseball fields are visible to the south. The storage units and the building that currently houses a restaurant are visible to the west. The buildings to the east that currently house small machine manufacturing and a vehicle detailing shop and the building to the north that currently houses automotive repair are visible.

2010 aerial photograph

The 2010 aerial photograph shows the subject property with the Armory. There are a line of what appears to be trailers along the western side of the parking lot. Baseball fields are visible to the south. The storage units and the building that currently houses a restaurant are visible to the west. The buildings to the east that currently house small machine manufacturing and a vehicle detailing shop and the building to the north that currently houses automotive repair are visible.

2012 aerial photograph

The 2012 aerial photograph shows the subject property with the Armory. There are areas of distressed vegetation from the line of what appeared to be trailers

along the western side of the parking lot. Baseball fields are visible to the south. The storage units and the building that currently houses a restaurant are visible to the west. The buildings to the east that currently house small machine manufacturing and a vehicle detailing shop and the building to the north that currently houses automotive repair are visible.

3.9.2 Fire Insurance Maps

Sanborn maps do not cover this area as it is too far outside of the city center.

3.9.3 Historic USGS Topographic Maps

Due to the limited number of aerial photographs found of the property, historic USGS topographic maps were also reviewed for property information. Historical maps from Hulbert 1948, Hulbert 1950, Hulbert 1972, Thompson Corner 1974, Muskogee 1978, and Thompson Corner 2010 were obtained from the USGS website. All these maps are located in Appendix I.

Hulbert 1948

The subject property is visible. No buildings, mines, or wells are noted on the property or the adjacent properties to the north, west and south. The property adjacent to the east is not visible on the map.

Hulbert 1950

The subject property is visible. No buildings, mines, or wells are noted on the property or the adjacent properties to the north, west and south. The property adjacent to the east is not visible on the map.

Hulbert 1972

This map overlays an aerial photograph from December 1972. The subject property is visible. No buildings are visible on the property. The property and adjacent properties to the west, south and east appear to be in agricultural use. The adjacent property to the west has a pond present. The airport is visible to the northwest of the property.

Thompson Corner 1974

The subject property is visible. No buildings, mines, or wells are noted on the property or adjacent properties to the north, west, and south. The property to the east is not on the map. The property to the west has a pond present on it. The Tahlequah Municipal Airport is visible to the northwest.

Muskogee 1978

The subject property is not visible. No buildings, mines, or wells are visible to the north, west or south. The subject property and the adjacent properties to the east are not visible. The Tahlequah Airfield is visible to the northwest of the subject property.

Thompson Corner 2010

The subject property is visible. The map overlays an aerial photograph from May 2008. The armory building is visible, and the sanitary pond footprints are highlighted. Baseball fields are visible to the south. The storage unit buildings and the building for the restaurant are visible to the west. The property to the east is not visible. Tahlequah Municipal Airport is visible to the northwest.

3.10 Current and Past Uses of Adjoining Properties

Currently the areas surrounding the site are light industrial, park and undeveloped land. The areas to the north have always been undeveloped and are still undeveloped. The area to the east and northeast are light industrial currently housing small equipment manufacturing, automotive detailing, and automotive repair. The area to the west is currently occupied by storage units, and a restaurant. The area to the south is occupied by a baseball park and trailer park.

3.11 Environmental (Physical) Setting

DEQ reviewed several sources to obtain information on the physical setting of the subject property and its surrounding areas. These sources include: The United States Department of Agriculture Cherokee County Soil Survey, Oklahoma Water Resource Board data viewer, and the Federal Emergency Management Association. Review of the physical setting of the area is to evaluate the sensitivity of the hydrogeology to potential contamination from sources either on or near the site.

3.11.1 Surface Water Characteristics

The topography of the area is relatively flat. The former Tahlequah Armory is located at a surface elevation of approximately 875 feet above mean sea level. The topographical gradient is to the north, toward Pecan Creek. Pecan Creek is 0.2 miles north of the site.

According to the Federal Emergency Management Association (FEMA), the subject property is in an area outside the 500 year flood plain. According to FEMA (Ref. 12), the property is located in Zone C which means it is outside the

500 year flood plain. The armory lies outside of the flood boundary line. A map of this information is located in Appendix D.

3.11.2 Subsurface Geological Characterization

Cherokee County is mainly comprised of the Ozark Plateau within the Ozark Uplift regions. This area is characterized by a deeply dissected plateau formed by limestones and cherts. Caves and sinkholes may occur in this area (Ref. 19)

According to the Soil Survey of Cherokee County, Oklahoma, the subject property consists of Okemah Silty Clay Loam. The Okemah unit comprises 100% of the subject property area of interest and is characterized by a slope of 0 to 1 percent, a water table depth of 12 to 30 inches, and moderately low to high water capacity (Ref. 14).

3.11.3 Ground Water Characteristics

The hydrogeology as reported by the Oklahoma Water Resources Board (OWRB) indicates the site is on top of the Boone, and the Northeastern Oklahoma Pennsylvanian, which are minor groundwater basins, and the Rubidoux which is a major groundwater basin. The Boone basin is unfavorable for production of groundwater due to its low yield of 10 gpm. The Rubidoux basin is a bedrock basin with a strongly varying saturated thickness. The Rubidoux is generally unfavorable for groundwater production due to high chloride levels in the water. The aquifer vulnerability for the area around the site is high for the Boone Basin and low for the Rubidoux.

The OWRB Reported Well Log Viewer was utilized to make a map of groundwater and monitoring wells within a half mile radius of the subject property. There are two wells within 0.50 miles of the property, both are groundwater wells; one is domestic and the other is for irrigation. The closest groundwater well is 0.4 miles southeast of the subject property, and is used for domestic water purposes. For a list and map of wells that are within 0.50 miles of the subject property, see Appendix M.

The subject property obtains its drinking water from the Tahlequah Public Works Authority, which uses surface water as its water source. The Tahlequah Public Works Authority is currently using the Illinois River, to the east of the city, as its water source.

3.11.4 Air Characteristics

No air emissions were noticed at the subject property or the adjoining properties. The DEQ dataviewer database was searched for Air Quality Permitted Facilities (AQPF). No AQPF were found within a 1 mile radius from the subject property.

4.0 Records Review

A regulatory database search was conducted by DEQ. This search included, at a minimum, those records and distances from the site dictated as appropriate in the ASTM standard. DEQ performed a review of available federal and state databases to assess whether the subject property or proximate properties were listed as having environmental concerns, which could have an adverse impact on the subject property. The following provides a summary of the databases reviewed.

4.1 Federal National Priorities List (NPL)

A search of the Environmental Protection Agency's NPL database shows no current NPL sites within a mile radius of the subject property (Ref. 5). The subject property is not an NPL site.

The database also shows no delisted NPL sites within a half mile radius of the subject property.

4.2 Federal CERCLIS List

The EPA database for Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Information Systems (CERCLIS) was searched for active and archived CERCLIS sites on and near the subject property (Ref. 7). The ASTM's recommended search radius for the subject property for both active and archived CERCLIS sites is ½ mile. No CERCLIS sites were found within a ½ mile radius of the site. The property is not listed as an active CERCLIS site.

The subject property is also not listed in the archived CERCLIS site list. There are no archived sites within a ½ mile of the subject property.

4.3 Federal RCRA CORRACTs List

The EPA database for Resource Conservation and Recovery Act (RCRA) facilities subject to corrective action was searched within the ASTM's required minimum distance of one mile of the subject property (Ref. 8). No RCRA CORRACT facility was found within the one-mile radius of the subject property.

4.4 Federal RCRA non-CORRACTS TSD List

The EPA database for RCRA facilities not subject to corrective action was searched within the ASTM's required minimum distance of ½ mile of the subject property (Ref. 8). No RCRA non-CORRACT Treatment, Storage and Disposal (TSD) sites are within the ½ mile radius of the subject property.

4.5 Federal RCRA Generators List

The EPA RCRA Notifiers database was searched for RCRA generators within the ASTM's required minimum search distance of the subject property and adjoining properties (Ref. 8). The subject property did not have any RCRA notifiers or generators. There were also no facilities found near the subject property. No large quantity generators were reported within the subject property and its adjoining properties. For a list of local generators outside of the search radius see Appendix J.

4.6 Federal ERNS List

The Emergency Response Notification system (ERNS) maintained by the National Response Center was searched for any hazardous substance releases or spills within the subject property (Ref. 9). ASTM requires a minimum search distance of property only when identifying ERNS cases. No ERNS sites were reported within the property or the adjoining properties. For a list of local incidents outside of the search radius see Appendix H.

4.7 Federal Institutional Control/Engineering Control Registries

There are no known Institutional Control/Engineering Controls in effect for this property.

4.8 State-Equivalent NPL

DEQ does not have a State-equivalent NPL database. Oklahoma does not have a State Superfund law to establish a State-equivalent NPL database.

4.9 State-Equivalent CERCLIS

DEQ does not have a State-equivalent CERCLIS database.

4.10 State Landfill and / or Solid Waste Disposal Sites

DEQ regulates landfills and solid waste disposal sites across the State of Oklahoma (Ref. 10). State landfills and solid waste disposal facilities were searched in the DEQ database within the ASTM required minimum distance of ½ mile from the subject property. No permitted landfills or solid waste disposal facilities are located within the search distance of the subject property.

4.11 State Leaking UST List

The OCC UST Notification Database and OWRB's Online Data viewer were searched to locate any known leaking underground storage tank (LUST) sites located within the ASTM's

minimum search distance of a ½ mile of the subject property. Four LUST sites were found within the ½ mile radius. The following sites are listed and described below.

- Tahlequah Airport, located at 2100 Airport Parkway, is north of the subject property. The two tanks are listed as permanently out of service, two are listed as temporarily out of service and two are listed as currently in service. The cases are all closed, but there are no other records regarding these LUSTs. The LUST case Facility ID number is BF-0503.

4.12 State Registered UST Sites

The OCC UST Notification Database was searched to locate registered underground storage tanks (UST) located within the ASTM's minimum search distance of the subject property and its adjoining properties. The subject property formerly contained a 6,000 gallon gasoline UST on the property. The UST was removed December 9, 1993 from the subject property (Appendix K). No leaks were reported to the OCC for the UST. Following the tank removal the soil was sampled from the wall and the backfill of the tank pit. Soil samples collected were below detection limits for every analysis except for Xylenes which was detected at 0.0424 mg/L which is below GW MCLs. No registered USTs were found on the adjoining properties. For a list of registered UST sites, see Appendix L.

4.13 State Institutional Control/Engineering Control Registries

According to the DEQ Brownfield's Institutional Control Database there are no known Institutional Control/Engineering Controls in effect for this property (Ref. 16).

4.14 State Voluntary Cleanup Sites

The DEQ Online Data Viewer was searched for Voluntary Cleanup Program (VCP) sites within the required ASTM search distance of ½ mile of the Tahlequah Armory (Ref. 11). No VCP sites are located on or within ½ mile of the subject property.

4.15 State Brownfield Sites

The DEQ Brownfield database was searched for Brownfield sites within the required ASTM search distance of ½ mile of the Tahlequah Armory (Ref. 17). No Brownfield sites were found within ½ mile of the Tahlequah Armory.

4.16 Oil and Gas Records

The subject property is within SW NE corner of Section 30, T17N, R22E, Cherokee County, Oklahoma. The DEQ performed a search of oil and gas records from the Oklahoma

Corporation Commission's (OCC) oil and gas records database. There were no records of wells on the subject property or in adjacent areas.

4.17 Dry Cleaners

A search of DEQ's historic dry cleaner databases was performed (Ref. XX) and a search on google maps was performed (Ref. XX) to search for present day dry cleaners within one mile of the subject property. No dry cleaners were found within the search radius.

5.0 Site Reconnaissance and Interviews

5.1 Methodology and Limiting Conditions

A site reconnaissance of the subject property located at 100 S. Phoenix Ave., Tahlequah, OK was performed on June 21, 2011. Rachel Francks and Alisha Grayson of the DEQ met the caretaker of the subject property, Mark Manship (City of Tahlequah) at the subject property. Manship introduced Francks and Grayson to the site and answered questions to the best of his knowledge on the site. Manship provided keys to the building and provided background information about the property to the best of his knowledge. All areas of the building were observed noting any environmental conditions that might need additional investigation. The entire outside area of the subject property was walked through for observations that might need additional investigation as well.

5.2 General Site conditions

The former Tahlequah Armory Property is composed of a brick building of approximately 17250 square feet that was built in 1982 and contains an indoor firing range (IFR). The building is currently unoccupied. The property surrounding the building consists of light industrial and undeveloped land to the west, north, and east, asphalt parking lots to the west and south; and baseball fields to the south. The subject property is outside of town and paved streets are located to the north and east of the subject property. The following are general site conditions that were evaluated on the property and adjacent properties.

5.2.1 Aboveground Storage Tanks (ASTs)

There were no ASTs at the site, nor was there any indication that there had been at any point.

5.2.2 Landfills and/or Dumping

There was no indication that any part of the property had been used as a landfill at any point.

5.2.3 Impoundments

There was no standing water on the property. There is a ditch between the road and the property to the north of the armory. There was no water in it at the time of the site visit. Historically there were two sanitary lagoons to the west of the armory building. There was no water present in the lagoons at the time of the visit, but the depressions were still visible. It seems likely the water will flow with the topographical gradient to the west and then north.

5.2.4 Monitoring Wells

There were no wells noted during the site visit. The OWRB data viewer has no record of wells being located on the property.

5.2.5 Disturbed and Stained Soils

The gravel lot where vehicles were kept was too overgrown to determine if stained soils were present. The vegetation around the armory appeared to be in good condition and did not appear distressed. There were small bare patches to the west of the armory building, though it is assumed these were related to the presence of storage units or moving containers that were present on the property in aerial photos from 2010. An area of gravel was present to the west of the vehicle washing pad. OMD documents noted the area contained a “chat pile” though it is uncertain whether this was mining chat or gravel. Francks collected a soil sample and returned it to the State Environmental Lab for analysis for metals. The results of the metal screening have detectable levels of lead, but the levels are below standards for Residential Soil of 400 ppm. Sample results can be found in Appendix Q.

5.2.6 Seeps

No seeps of any kind were observed at the subject property.

5.2.7 Chemical Spills

No evidence of possible chemical spills was observed on the subject property.

5.2.8 Farm Waste

No farm waste was observed at the subject property.

5.2.9 Known Pesticide Misapplication

No known pesticide misapplications were detected during the site visit or during the supportive research.

5.2.10 Discharges and Runoff from Adjacent Property Affecting the Site

Rainwater runs off to the west side of the subject property. No potential pollutants were observed on the neighboring properties that may affect the armory.

5.2.11 Petroleum Products and Oil and Natural Gas Exploration

No petroleum products or oil and natural gas exploration was observed during the site visit.

5.2.12 Asbestos

Since many of the State armories were built before the 1970s, there is a high potential of finding asbestos containing material (ACM) in the armory buildings. The U.S. began banning the use of asbestos in most building products in the 1970s due to studies confirming the harmful health effects caused by exposure to airborne asbestos. ACM may be found in the insulation wrapping of the heating pipes and/or heaters, roofing materials, ceiling tiles, window putty, mastic, and floor tiles. Floor tiles that are 9"x9" have been found to regularly contain asbestos.

DEQ's consultant, Marshall Environmental Management, conducted an asbestos inspection at the subject property on July 6, 2012 and found asbestos in the yellow mastic in rooms 5, 9, and 10. DEQ SCAP's contractors completed the cleanup of asbestos, lead-based paint, and lead dust in the armory on April 9, 2013. See Appendix R for a copy of the asbestos inspection.

5.2.13 Lead

There is an IFR in the armory building, so any lead dust is most likely due to activities from the range or gun cleaning activities. The armory has a roof mounted hood. Previous sampling by DEQ at armories with a similar vent system along downspouts from the gutters attached to the roof near the IFR vent have shown lead levels are below screening of 400 mg/kg levels. Sampling at downspouts was not performed at this armory.

According to the lead-based paint inspection and surface dust sampling conducted by Marshall Environmental Management on July 6, 2012 (Appendix R). Lead-based paint was found in Room 23 (white paint on concrete wall) and lead dust was found in every room in the building. However, not every room was above the 40 µg/ ft² standard. For more detail, see the lead-based paint inspection and surface dust sampling report in Appendix R. DEQ SCAP's contractors completed the cleanup of asbestos, lead-based paint, and lead dust in the armory on April 9, 2013.

5.2.14 Transformers/PCB Equipment

There were two transformers observed to the east of the site on adjacent properties. It is unknown if the transformer contains PCBs, but the transformers appeared to be in good conditions.

5.3 External Observations

There were no recognized issues with the exterior of the building.

5.4 Internal Observations

The building is currently unoccupied and was last used by the Oklahoma Army National Guard to support the military mission. The one story building was constructed from cinderblocks and brick in 1982. Before construction of the armory building, the land was owned by the City of Tahlequah and was unoccupied land. During the site visit on June 21, 2012, the building had some visible issues, most notably the roof is leaking in several places and the foundation is separating from the walls in some of the rooms. Additionally, the IFR was used to store junk by the previous occupants of the building. Manship assisted Francks and Grayson in removing locks placed by OMD on the door to the IFR and the observation room. The room is full of boxes and various items. A drum labeled Hazardous Waste was noted in the IFR. It was noted in a photograph taken of the firing range and was not noted during the inspection. DEQ has contacted OMD to remove the personnel files from the IFR. DEQ will do a follow up inspection of the IFR once some of the items have been removed. A thermometer without a cover plate was noted in the Drill Floor. Upon closer inspection it was noted that the vial that contains the mercury was cracked, though most of the mercury seemed to be present in the base of the vial. DEQ has addressed this issue. Photographs of the internal view of the site can be found in Appendix B.

5.5 Interviews

Jason Nichols was listed as the point of contact for the armory, he was not available the day of the site visit and so deferred introduction of the site to Mark Manship. Manship has limited knowledge of the site and was made available as the point of contact, because of his position with the City of Tahlequah. He provided access to the building for DEQ personnel, but had no extraordinary information regarding the history of the site. Therefore interviews were not utilized in determining the operational history of the site.

6.0 Findings

Summarized below are the major findings from this Targeted Brownfield Assessment and DEQ's recommendations. The major findings of the highest environmental concern are presented first.

- The former Tahlequah Armory was built in 1982. The land for the building was deeded by the City of Tahlequah to the Oklahoma Military Department for the State of Oklahoma, for benefit of the Oklahoma National Guard. The armory is currently owned by the City of Tahlequah and will be used by Tahlequah City Police once cleanup activities are complete. A Memorandum of Agreement (MOA) will be set in place between the OMD and the DEQ. Once cleanup activities have occurred, a notice of remediation and easement will be filed in the Cherokee County Courthouse.
- The building is potentially contaminated with lead-based paint, lead dust, mercury, and other contaminants. The Oklahoma Department of Environmental Quality Site Cleanup Assistance Program completed the remediation of lead-based paint, lead dust, and asbestos contamination on the subject property and proper disposal of the damaged mercury thermostats, other contained hazardous wastes, and all associated waste on April 9, 2013. The lead-based paint, lead dust, asbestos, and potential mercury contamination in the building are HRECs.
- OCC records show the property formerly contained a 6,000 gallon UST that was removed December 9, 1993. Soil and water samples collected below the tank were below action levels. The former UST is considered a HREC.
- No National Priority List (NPL), delisted NPL sites, Resource Conservation and Recovery Act (RCRA) non-corrective action sites (CORRACTS) treatment, storage, and disposal (TSD) listings, Emergency Response Notification System (ERNS) list, Institutional Controls/Engineering Controls, or State landfills and/or solid waste disposal sites were found on the subject property or within the ASTM recommended search radii. No RCRA generators, Voluntary Cleanup (VCP) sites, or Brownfield sites were found on the subject property. There were no RCRA generators listed on the subject property or adjacent properties. There were no archived Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) site listings. The subject property is on the DEQ Site Cleanup Assistance Program (SCAP) list for cleanup of lead and asbestos contamination.
- One facility with leaking underground storage tanks was found within a ½ mile radius of the subject property. They are potentially upgradient of the site, but due to the relatively flat area the site is located in it is difficult to determine whether they are likely to impact the site.
- No transformers were noted on the site, though three are present on adjoining properties. Fluorescent lighting ballasts are located throughout the building. The lighting ballasts are all in good condition. The lighting ballasts may be a source of mercury.

7.0 Opinion and Recommendations

Due to the past use of the property and potential contamination found on the subject property, the environmental professionals working on this site believe that cleanup of lead, mercury and disposal of contained wastes will be necessary. DEQ SCAP completed cleanup of lead-based paint, lead dust, and asbestos contamination on April 9, 2013. DEQ and/or its contractors removed the hazardous waste and damaged mercury thermostats from the building.

8.0 Data Gaps

No tribal information was obtained for this assessment. No tax records, city directories, or zoning records were reviewed for this report. No interviews of the operational history of the building were conducted. However, this did not affect the ability of the DEQ to make a recommendation on the subject property.

9.0 Conclusions

DEQ has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-05 of the former Tahlequah armory located at 100 Phoenix Ave., Tahlequah, Oklahoma. Any exceptions to, or deletions from, this standard are described in Sections 8.0, 10.0, and 11.0 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with this property.

The information provided in this assessment is to assist the City of Tahlequah in its revitalization planning as well as meet the All Appropriate Inquiry requirement of the landowner liability protections under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, better known as Superfund – Ref. 2), as provided in the Small Business Relief and Brownfields Revitalization Act of 2002 (Public Law 107-118, Subtitle B – Ref. 3).

10.0 Additional Services

In addition to this Phase I Targeted Brownfield Assessment, DEQ has provided sampling analysis of potential asbestos, lead-based paint, and lead sources, inside and outside, as well as providing the remediation of the building.

11.0 Deviations

The following deviations from ASTM Practice E 1527-05 occur in this Phase I Targeted Brownfield Assessment. No tax records, city directories, or zoning records were reviewed for this report.

References

1. U.S. Environmental Protection Agency. (2008). *Oklahoma Brownfields Assistance Agreement (No #RP96681001-0)*. Unpublished Document. State of Oklahoma: Oklahoma City, Oklahoma.
2. U.S. Environmental Protection Agency. (1980). *Comprehensive Environmental Response, Compensation, and Liability Act. (Public Law 96-510)*. Washington, DC: U.S. Government Printing Office.
3. U.S. Environmental Protection Agency. (2002). *Small Business Liability Relief and Brownfields Revitalization Act. (Public Law 107-118, Subtitle B)*. Washington, DC: U.S. Government Printing Office
4. ASTM International. (2005). *Water and Environmental Technology: Phase I Environmental Site Assessment E 1527 – 05*. Baltimore, Maryland.
5. Environmental Protection Agency. *EPA National Priority List*. Last accessed June 25, 2013. <http://www.epa.gov/superfund/sites/npl/status.htm>.
6. Environmental Protection Agency. *EPA Deleted National Priority List*. Last accessed June 25, 2013. <http://www.epa.gov/superfund/sites/query/queryhtm/npldel.htm>
7. Environmental Protection Agency. *CERCLIS current and archived sites*. Last accessed June 25, 2013. <http://cfpub.epa.gov/supercpad/cursites/srchsites.cfm>.
8. Environmental Protection Agency. *RCRA database*. Last accessed June 25, 2013. RCRA database. http://www.epa.gov/enviro/html/rcris/rcris_query_java.html.
9. National Response Center. *Emergency Response Notification System*. Last accessed June 25, 2013. <http://www.nrc.uscg.mil/foia.html>.
10. Oklahoma Department of Environmental Quality. *State Landfill site list*. Last accessed June 25, 2013. <http://www.deq.state.ok.us/LpDnew/swindex.html>.
11. Oklahoma Department of Environmental Quality. *ODEQ Online Data Viewer*. Last accessed June 25, 2013. http://maps.scigis.com/deq_wq/
12. Federal Emergency Management Association (FEMA). *FEMA Issued Flood Maps*. Last accessed April 10, 2012. <http://www.msc.fema.gov/webapp/wcs/stores/servlet/CategoryDisplay?catalogId=10001&storeId=10001&categoryId=12001&langId=-1&userType=G&type=1&future=false>
13. Oklahoma Department of Environmental Quality. *RCRA NOTIFIERS sorted by county and then city*. Last accessed June 25, 2013. <http://www.deq.state.ok.us/LPDnew/HW/Notifiers/notifiersbycountycity.pdf>.
14. United States Department of Agriculture, Natural Resources Conservation Service. (n.d.). *Web soil survey*. Last accessed April 10, 2012. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>
15. Oklahoma Water Resources Board. *OWRB Custom Map Viewer-Data Driven Map Viewers*. Last accessed June 25, 2013. <http://www.owrb.ok.gov/maps/server/wims.php>.
16. Oklahoma Department of Environmental Quality. *Oklahoma Brownfield's Institutional Control Database*. Last accessed June 25, 2013. <http://www.deq.state.ok.us/lpdnew/Brownfields/IC%20Documents/IC%20Database%20edit.html>
17. Oklahoma Department of Environmental Quality. *Oklahoma Brownfield's Public Record*. Last accessed June 25, 2013. <http://www.deq.state.ok.us/lpdnew/Brownfields/PublicRecordBrownfields.pdf>

18. Digital Sanborn Maps 1867-1970. *Tahlequah, Cherokee County, OK. (1946)*. Last Accessed April 12, 2011.
<http://sanborn.umi.com/>
19. Rachel Francks, Oklahoma Department of Environmental Quality, interview notes with Marshall County Chamber of Commerce Treasurer, Kate Brennan April 11, 2011, Tahlequah Armory.