Targeted Brownfields Assessment
Oklahoma Army National Guard
Tishomingo Armory
Tishomingo, Oklahoma

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

December 27, 2006

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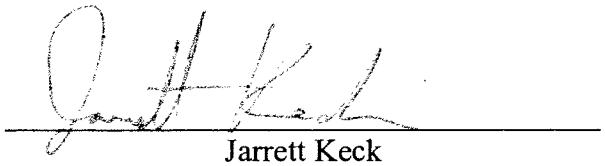
Environmental Professionals in charge of the project:

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 this part. 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.



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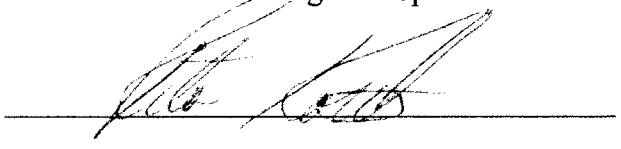

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Background and Disclaimer: The purpose of an environmental site assessment is to identify actual or potential "recognized environmental conditions" that may result in liability or land use restrictions. The ASTM Phase I Environmental Site Assessment E 1527 – 05 is the minimum standard for environmental due diligence in the commercial real estate industry and currently 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 redevelopment project. However, the identification of old hazardous waste sites is an evolving process; therefore, DEQ cannot state with absolute certainty that no other hazardous waste is located in the area. 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.

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1.0 Executive Summary

This Phase I Targeted Brownfield Assessment of the Tishomingo Armory was performed in accordance with the ASTM E 1527-05, a guide for conducting Environmental Site Assessments. Jarrett Keck performed the site reconnaissance on September 6, 2006.

The site is located on the grounds of Murray State College at 500 East 24th Street in Tishomingo, Oklahoma, Johnston County. The property consists of 0.69 acres of land.

A cursory summary of findings is provided below. However, details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein.

- A basement indoor firing range (IFR) sand trap and dust residue is assumed to have lead contamination based on past sampling of the drill floor adjacent to the IFR entry indicating elevated lead concentrations are present in the building. Lead dust may also have contaminated the shallow soils outside the IFR vent window.

- Water from a seep in the IFR roof may run into the floor drain located in the middle of the firing range (IFR). The drain may discharge lead contaminated water from the IFR into the sanitary sewer system.

- Water infiltration into the IFR has seeped through the concrete roof on the north side as well as various rooms throughout the armory. This has caused the room to become humid and may potentially cause the growth of mold.

- Mercury may be present in thermostats, lighting, and other equipment in the facility.

- The original paint on in the armory remains in most areas of the building and has began chipping in some areas. Due to the timeframe the building was constructed, lead based paint may have been used.

- Soils below the windows may have been contaminated with lead based paint chips.

- The original heating equipment, roofing materials, and flooring historically used in the armory may have been constructed with asbestos containing materials (ACM).

- Polychlorinated Biphenyls (PCBS) may be present in electric equipment such as ballasts, transformers, and capacitors installed prior to 1978.

- One 1,000-gallon underground storage tank (UST) was once located on the premises of the armory. The UST contained diesel fuel. The tank was removed from the property. After soil samples confirmed to no contamination resulted from the UST, the case was closed in 1997 under Oklahoma Corporation Commission (OCC) regulations.

Recommendations

Based on the findings of this assessment, The DEQ recommends that additional investigation be conducted to evaluate areas of the property that may need future clean up and remediation.

- The indoor firing range (IFR), IFR floor drain, adjacent interior areas, and soils outside the IFR vent window need additional evaluation and remediation of the lead contamination
- The standing water as well as the drain in the middle of the IFR should also be investigated for possible drainage of lead contamination into the city sewer.
- Due to the age of the building heating equipment, roofing, surfacing materials, and flooring should be evaluated for asbestos.
- The original paint used in the building as well as soils around exterior painted areas should to be tested for lead.

2.0 Introduction

The State of Oklahoma Department of Environmental Quality (DEQ) under a Brownfield Assistance Agreement (No. VC98677601) (Ref. 1) with the U.S. Environmental Protection Agency (EPA) conducted a Targeted Brownfield Assessment of the Tishomingo Armory.

2.1 Purpose

The purpose of this assessment is to look at the environmental conditions within the target area and provide this information to Murray State College in Tishomingo, Oklahoma to assist in its redevelopment 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). 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.

The DEQ is providing technical assistance to the project by evaluating the environmental condition of the property prior to Murray State College acquiring the property. Funding for this assessment has been provided by the U.S. Environmental Protection Agency (EPA).

2.2 Detailed Scope-of-Services

The DEQ examined the current use of the property and then identified the historical uses of the property to determine if recognized environmental conditions exist. The DEQ examined historical documents, government databases, deed records, aerial photographs,

governmental environmental files, Sanborn Fire Insurance Maps, conducted interviews with past unit members, and conducted 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

Significant assumptions and past studies of the Oklahoma Army National Guard Armories suggest there is a possibility of lead and asbestos contamination at the Tishomingo Armory. Most of the State armories, such as the Tishomingo Armory, have indoor firing ranges. These ranges usually contain concentrations of lead from past shooting activity. Since all of the armories were built before 1978, there is a high potential of finding Polychlorinated Biphenyl (PCB) and asbestos containing materials (ACMs) in the armory buildings. The U.S. began banning the use of asbestos and PCB's in most building products in 1978. ACM was commonly used in insulation wrapping of the heating pipes and/or heaters and flooring. PCBs are commonly found in electrical transformers, lighting and ballasts purchased prior to 1978. Mercury containing thermostats, sump pump switches, are commonly found in building process equipment and may be present in the armory.

The Oklahoma Military Department verbally informed the DEQ that a significant asbestos abatement of the pipe was conducted in the 1990s, but that asbestos remains on the elbow joints. Visual inspection by the DEQ of the Tishomingo Armory indicated that asbestos may still be present in the building.

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 redevelopment. The ASTM Phase I Environmental Site Assessment E 1527 – 05 (Ref. 4) is the minimum standard for environmental due diligence in the commercial 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 redevelopment 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 government records, interviews with knowledgeable residents in the community, information provided by, Johnston County, Murray State College, the Oklahoma Military Department 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 building materials, soil, rock, groundwater, surface water, or air.

2.5 Special Terms and Conditions

This assessment report has been prepared for the Murray State College 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 Description

3.1 Location and Legal Description

The site is located on the grounds of Murray State College at 500 East 24th Street in Tishomingo, Johnston County, Oklahoma,. The main entrance to the armory is located at latitude 34° 13' 23.23", longitude -96° 40' 33.87". The property consists of 0.69 acres of land. The legal description is as follows:
A tract of land located in the West half (W1/2) of the Southeast quarter (SE1/4) of section 9, Township four (4) South, range (6) East, of the Indian Base and Meridian, described as follows: The starting point being one hundred (100) feet West and seventy-five (75) feet South of the Northeast (NE) corner of the West half (W1/2) of the SE quarter (SE1/4), thence West two hundred (200) feet, thence South one hundred fifty (150) feet, thence East two hundred (2000 feet, thence North one hundred fifty (150) feet to the place of beginning, together with all improvements thereon and the appurtenances thereunto belonging, and warrant the title to same.

3.2 Site and Vicinity General Characteristics

Environmental Setting
The general topography of the area is shown in Figure 1 of Appendix C. The armory is located on the campus of Murray State College. The land is generally flat and surrounded by Murray State College, medical offices, and residential houses. Further south from the armory opens to farm and ranch land. Pennington Creek is approximately one-half mile west of the armory

Johnston County, in the south-central part of Oklahoma, has an area of 420,480 acres. Tishomingo, the county seat, is located in the central part of the county. The county lies within the Grand Prairie and Southern Coastal Plain land resource areas (Ref. 5).

In winter the average temperature is 44 degrees Fahrenheit, and the average daily minimum temperature is 31 degrees Fahrenheit. In summer the average temperature is 81 degrees Fahrenheit, and the average daily maximum temperature is 94 degrees Fahrenheit. Of the total annual 49 inches precipitation, 23 inches, or 59 percent, usually falls in April through September (Ref. 5).

The raising of beef cattle is the major enterprise in Johnston County. Industry is limited. Some limestone, granite and sand are quarried for commercial purposes. Recreational facilities in the vicinity of Lake Texoma are important to the economy of the area (Ref. 5).

Groundwater

The subject property is underlain by alluvium and terrace deposits along the Washita and Red Rivers described as the Antlers Sand formation. The Antlers Sand Formation is mainly sand, white to yellow, medium grained, weakly indurated, with varicolored clays. It contains arkosic conglomerates near the Arbuckle Mountains and Baum Limestone near the Mannsville anticline; the thickness ranges from about 200 to about 700 feet (ft.) and is a known recharge area for the Antlers Sandstone formation to the south (Ref. 6).

Groundwater underlying the subject property yields moderate to large amounts of water ranging from 10 to 50 gallons per minute (gpm). Properly constructed wells at favorable sites may yield as much as 400 gpm. One well, approximately 3.5 miles southeast of the Tishomingo, has a water level at 1 ft. below ground surface (bgs) to total well depth of 17 ft. bgs. The yield of this well is at 66 gallons per minute. Another well, approximately 2 miles south of the property, has a water level at 8 ft. bgs to a total well depth of 28 ft. bgs. The yield of this well is at 70 gallons per minute (Ref. 6).

Chemical quality of water is generally good underlying the subject property. Analysis of water samples show the dissolved-solids content of much of the water to range from 500 to 1000 milligrams per liter (mg/l). Water from the area adjacent to the Washita and Red Rivers is of the calcium magnesium bicarbonate type. The water is generally suitable for most municipal and irrigation uses (Ref. 6).
There is no evidence to suggest groundwater contamination resulted form historic or current activities at the site.

Soils

The Gasil-Stephenville soils are the general soils located at the subject property. These soils are deep to moderately deep, very gently sloping, well drained loamy soils that have loamy subsoil on uplands (Ref. 5).

The soil series that underlies the subject property is the Konawa fine sandy loam with 1 to 3 percent slopes. The Konawa series consists of deep, moderately permeable, nearly level through very gently sloping, well drained soils on uplands. These soils formed in materials weathered from loam and sandy sediments under a cover of hardwood forest and native grasses (Ref. 5).

In a representative profile the surface layer is brown, slightly acidic fine sandy loam that extends to a depth of 7 inches. The subsurface layer extends to a depth of 12 inches and is light brown, slightly acidic fine sandy loam. The subsoil is yellowish red, medium acidic sandy clay loam to a depth of 34 inches and yellowish red, slightly acidic fine sandy loam to a depth of 50 inches. The underlying material to a depth of 74 inches is yellowish red, medium acidic loamy fine sand (Ref. 5).

Available water capacity in the upper 40 inches ranges from 4.5 to 6 inches. The water intake rate is moderate (Ref. 5).

The main concerns of Konawa soil management are the hazard of erosion, soil structure, and fertility. Konawa soils properties are generally favorable to building site development. Any limitation can be easily overcome or minimized by special planning or design. However use of the soils as construction materials for road fill is fair due to low strength and may be overcome with design. Topsoil is limited due to thin layering. The potential for irrigation, diversions and grassed waterways are limited due to the possibility for soil erosion. Erosion can be managed by tilling, grading, seeding or other engineering controls. The soils are generally unsuitable for ponds, sewage lagoons areas and trenched sanitary landfills due to the likelihood for seepage. This usually requires major soil reclamation, special designs, or intensive maintenance to overcome limitations (Ref. 5).

Shallow soils may be affected by lead contamination from lead dust residue outside the IFR vent window, and exterior painted surfaces that contain lead. With the exeption of the IFR activities, there is no evidence to suggest historic or current activities at the armory contributed to subsurface soil contamination.

Air

The prevailing wind is from the south. Average wind speed is highest, at 12 miles per hour, in March (Ref. 5). Musty odors were observed in the room near the northeast corner of the drill hall and in the IFR. No other visible emissions or odors were observed during the site visit (Ref. 7). Based on a report provided by the military department (Appendix F) Lead dust residue assumed to be present in the IFR and may have affected adjacent rooms in the armory. The IFR and adjacent rooms should be evaluated for lead dust contamination. Due to the age of the building, friable ACM may be present. The heating unit and associated ducting/piping insulation, roofing, and flooring should be evaluated for asbestos.

Surface water

The majority of the streams of the county enters from the west and northwest and generally flows southwards to Lake Texoma and further into the Red River. The elevation of the county averages approximately 650 feet. The area where the Tishomingo Armory lies is in an area determined to be outside the 500-year floodplain (Ref. 8).
Drinking water for Murray State College is supplied by a surface water intake operated by the College located west of the armory in Pennington Creek. A backup surface water

intake supply from Pennington Creek up gradient from the armory is operated by the City of Tishomingo (Ref. 7). The intake operated by the College is down gradient from the Armory. However, based on historic activities at the Site, there are no surface water issues impacted by or affecting the Site.

Utilities

Utility information was obtained from the Oklahoma Corporation Commission Utility Directory. Natural gas is supplied by the Oklahoma Natural Gas Company and electricity is supplied by the Oklahoma Gas & Electricity Company. Water is supplied by Murray State College. Telephone service is supplied by AT&T. The sanitary sewer system is operated by Murray State Collage (Ref. 9).

Underground features

There was once a 1,000-gallon underground storage tank (UST), containing diesel fuel located on the premises of the Tishomingo Armory property. The tank was removed in September 17, 1997 under OCC regulations. Soil samples were collected and analyzed to confirm no release from the UST had occurred that would impact soil or groundwater. Floor drains located in the Armory drain to the sanitary sewer. A sewer manhole is located to the northwest of the Armory property. No cisterns, sumps or septic tanks were noticed during the site visit (Ref. 7).

Structures

The Tishomingo Armory building is constructed of stone and concrete. The main entrance is located on the north side of the building. Through the main door is a hallway where access to office space is located. The east side of the building is the main entrance used by Murray State College maintenance employees. A small garage/shop space is located to the northeast and the entrance to the drill floor is to the southeast. The IFR is located in the basement of the building on the west side of the building beneath the mess hall area. A floor drain in the IFR is gravity fed and drains into the sanitary sewer. There is a concrete and brick foundation located on the northeast side of the property grounds. The foundation is nearly ground level and there is no structure built on it. It appears it may have had plumbing and a sewer system installed at one time but all pipelines in the slab are plugged with clay. It is unknown what the foundation was used for (Ref.7).

Aboveground Storage Tanks (ASTs)

No AST's were observed during the site visit. No staining or evidence of the past presence of an AST was observed during the site visit (Ref. 7).

Landfills, Dumping, Disturbed Soil

There are no landfills, dumping, or disturbed soil at the subject property or adjoining properties. Southern Oklahoma Regional Disposal Landfill is the nearest landfill located in Ardmore, OK (Ref. 10). There is no disturbed soil or distressed vegetation on the property (Ref. 7).

Impoundments
No impoundments were observed on the subject property (Ref.7).

Air Emissions, Wastewater Discharge
There are no visible air emissions coming from the subject property. A musty odor was observed in the basement IFR and in a small room located to the northeast of the drill hall. A window located in the IFR was used to vent air to the west side of the building Lead dust from the IFR may have affected the soils outside the vent window. The armory's wastewater is discharged to the sewer system. Lead contamination from the IFR may be present in the IFR drain and migrate into the sewer system. No wastewater discharge from adjacent facilities affects the property (Ref. 7).

Industrial Activities
Murray State College utilizes the armory for light repair/maintenance and storage activities. According to the armory, waste from this type of activity (floor wax, cleaning supplies) is properly handled and disposed of. No industrial activities occur within a one-half mile radius of the armory (Ref. 7).

Monitoring Wells
No monitoring wells are observed on the property during the site visit. The Oklahoma Water Resources Board well record database showed no recorded groundwater well close to the armory (Ref. 11).

Stained Soils
No stained soils were observed at the subject property during the site visit (Ref. 7).

Seeps
There is a seep of water infiltrating through the roof of the IFR at the north end causing a musty odor and some water damage. Roof leaks were observed in several rooms in the armory the most sever of them being the small room located northeast of the drill hall area (Ref. 7).

Chemical Spills
No chemical spills were observed at the subject property. According to a Murray State college employee, there have been no historic chemical spills on the property. No spills were reported on the property from the Emergency Response Notification System (ERNS) database (Ref 12).

Oil and Gas Exploration
No oil pipeline was observed on the property during the site visit. A gas supply line and meter is located on the west side of the building (Ref.7).

Known Groundwater or Surface Water contamination
There is no known groundwater contamination in this area. There is no surface water on the property or the adjoining properties (Ref. 7).

Farm Waste

No farm waste was observed at the subject property. Murray State College operates a livestock facility ½ mile south of the Armory, down gradient from the Site. No additional agricultural waste sources within a ½ mile radius of the property observed during the site visit (Ref. 7).

Known Pesticide Misapplication

No known pesticide misapplications were observed at the site (Ref. 7).

Discharges and Runoff from Adjacent Property Affecting the Site

No discharges and/or runoff were observed from any of the adjacent properties that would affect the subject property (Ref.7).

Other known or Suspected Environmental Concerns On the Site

Based on a previous lead dust investigation (Appendix F), the indoor firing range sand trap and dust residue is assumed to be contaminated by lead. Past sampling has been conducted to characterize the lead concentration in the armory. A statewide sampling event for lead was conducted by C.H. Guernsey & Company for the Oklahoma Army National Guard on all armories containing indoor firing ranges. This report is called the "Indoor Firing Range Lead Issues Report" (Ref. 19). No samples were collected in the IFR. One wipe sample was collected on the drill floor with a concentration of 146.95 ug/ft^2 (Ref. 13). A copy of the Tishomingo Armory section of the Indoor Firing Range Lead Issues Report can be found in Appendix F.

The paint in the armory could have concentrations of lead. Soils around the exterior painted surfaces of the armory may have been contaminated by lead paint.

Historical Recognized Environmental Conditions on the Site

Due to the age of the facility, Lead based paint, mercury, PCBs, and asbestos may have been used in the construction of the facility. There is known lead contamination in the drill floor area and assumed to be in the IFR. A UST was used at the armory and was removed in 1997. The UST case was closed then by the Oklahoma Corporation Commission (Appendix C).

Pipelines

A natural gas meter and associated pipeline is located on the west side of the building which supplies gas to the building. The main water supply comes from the Murray State College water supply. A back up pipeline is supplied by the City of Tishomingo. Sewage and waste water drain to sewer line. A manhole on the northwest side of the property allows access to the sewer. Drainage of the site is towards the east. There are roof drains on the west and south sides of the building. A floor drain in the middle of the indoor firing range drains by gravity into the sewer pipeline on the west side of the armory property (Ref. 7).

Transformers/PCB Equipment

One pole-mounted transformer was observed across the street from the armory on the west side off armory property. It is unknown if the transformer contains PCBs. The pole-mounted transformer appears to be in good condition. No sign of staining or historic leaking was observed during the site visit (Ref. 7). Electrical equipment such as fluorescent light ballasts purchase prior to 1977 may contain PCBs.

3.3 Operational History

The Tishomingo Armory was built in 1936 as part of a national Works Progress Administration (WPA) armory-building program. The Armory was managed and maintained by the Oklahoma Military Department to support the military mission of the Oklahoma Army National Guard (OKARNG). It served as a training site and stored military training materials and equipment. The OKARNG is a component of the United States Army and fulfills the military mission of national security. The building is currently listed on the National Register of Historic Places (Ref. 7).

The drill floor area was used by State College in cooperation with the National Guard on occasion for large social functions. The building was occupied by the Oklahoma National Guard until approximately 2001. The Armory sat vacant until approximately 2003 when the building was occupied by the Murray State College maintenance department (Ref.7)

3.4 Current Use of the Property

Murray State College maintenance department currently occupies the armory. The drill floor is mainly used for storage equipment and classroom/office furniture. A garage bay on the east side of the building is used as a maintenance/repair shop. Most of the office space in the building is not used. The unused space in the building still contains furniture and equipment from the National Guard (Ref. 7).

The building has degraded from lack of upkeep and years of weathering. Small puddles of water collect on the floors of the IFR and various rooms throughout the armory from past roof damage and deterioration. The IFR and other significantly water damaged areas are locked and entry is restricted (Ref. 7).

Murray State College plans to use the building as a student/community recreational center (Ref. 7).

3.5 Adjacent Properties

The armory is surrounded to the north and west by the Murray State College campus. To the immediate south is open land with vegetative ground cover and trees. Further to the south are the Murray State College dormitories. To the east and northeast of the armory are medical offices and residential properties (Ref. 7).

3.6 Site Inspection

Site reconnaissance was performed on the following date: September 6, 2006. A site reconnaissance was performed by DEQ representative Jarrett Keck. The Murray State College Director of Plant and Technology, Gary Cook, provided access to the facility. The site visits are explained in detail in Section 6.0.

4.0 User Provided Information

4.1 Title and Judicial Records

Title and judicial records were researched and reviewed on September 6, 2006. The land was originally owned by the Chickasaw Tribe until 1906 when ownership was transferred to the Oklahoma State Board of Agriculture. The State Board of Agriculture then sold the 0.69 acres of land where the armory is currently located to Oklahoma National Guard, State of Oklahoma on September 5, 1935. Since then, the Oklahoma Military Department has owned the property (Ref. 7).

4.2 Environmental Liens or Activity and Use Limitations (AULs)

There are no environmental liens or activity and use limitations that are known on the subject property (Ref. 7).

4.3 Specialized Knowledge or Experience of User

The Tishomingo Armory supported the military mission of the Oklahoma Army National Guard (OKARNG). The OKARNG is a component of the United States Army and fulfills the military mission of national security (Ref. 14).

Murray State College offers associate and certificate programs in various degrees. The college was initially established as an agricultural school in 1908. Murray State College has used the drill floor area of the armory for large social functions in cooperation with the National Guard. Murray State College began using the facility exclusively since approximately 2003 for storage and maintenance. No environmental impacts from Murray State College were observed during the site visit (Ref. 7).

4.4 Actual Knowledge of User

The Murray State College maintenance department currently occupies the building. The college wants to acquire the title to the property as soon as possible. However, this Phase I Targeted Brownfield Assessment and any necessary remedial activities must occur before this can happen. As of now, the State of Oklahoma has ownership of the property. The property will be transferred to Murray State College for use as a student/community recreational center once any necessary environmental cleanup is completed.

4.5 Commonly Known or Reasonably Ascertainable Information

The subject property is owned by the State of Oklahoma. The property is occupied by Murray State College. Lack of upkeep and weathering is shown throughout the armory. Remedial activities at the armory will have to be performed before the title will be transferred of the property (Ref. 7)

4.6 Valuation Reduction for Environmental Issues

This section is out of scope of this assessment.

4.7 Owner, Property Manager, and Occupant Information

The property is occupied by Murray State College. The Oklahoma Military Department owns the property (Ref. 7).

4.8 Reason for Performing Phase I

Murray State College would like to use the Tishomingo Armory property for a student/community recreation center. A Phase I TBA will be conducted along with any remedial actions necessary for future occupancy of the property. The DEQ is performing the assessment of the property to guide the remediation of the property and provide the College with documentation that All Appropriate Inquiry was performed prior to the acquisition of the property.

5.0 ***Records Review***

5.1 Standard Environmental Record Sources

A regulatory database search was conducted by the DEQ. This search included, at a minimum, those records and distances from the site dictated as appropriate in the ASTM standard. The 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.

Federal National Priorities List (NPL) Sites within one mile
The property is not listed on the NPL. There are no NPL sites reported within a one-mile radius of the subject property (Ref. 15).

Federal Delisted NPL site list within one-half mile
There are no delisted NPL sites within one-half mile of the Site (Ref. 15).

Federal Active Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Sites within one-half mile

The property is not on CERCLIS. There are no CERCLIS sites reported within a 0.50-mile radius of the subject property (Ref. 16).

Federal Archived CERCLIS (NFRAP) Sites within one-half mile

The property is not an archived CERCLIS site. There are no archived CERCLIS sites reported within a 0.50-mile radius of the subject property. The Mill Creek Drums Site is the closest archived CERCLIS site to the Tishomingo Armory. It is over 17 miles northwest of the armory (Ref. 16).

Federal RCRA CORRACTS Facilities List within one mile

The property does not have any federal RCRA CORRACTS facilities within one mile of the site (Ref. 17).

RCRA non-CORRACTS Transportation Storage and Disposal (TSD) Facilities List within one-half mile

The property does not have any RCRA non-CORRACTS TSD facilities within one-half mile of the site (Ref. 17).

Federal RCRA Generators List (property and adjoining properties)

The property is not a RCRIS-Large Quantity Generator (LQG) or RCRIS-Small Quantity Generator (SQG) site. There are no RCRIS LQG or SQG sites reported on the adjoining properties (Ref. 18).

Federal Institutional Control/Engineering control registries (property only)

There are no Institutional Control/Engineering controls on the property (Ref. 7); therefore, it is not listed on a Federal registry.

Federal Emergency Response Notification System (ERNS)list (property only)

The subject property and adjoining properties are not listed as an ERNS site (Ref. 12).

State lists of hazardous waste sites identified for investigation or Remediation (property only)

The site is on the Oklahoma Department of Environmental Quality's Site Cleanup Assistance Program for remediation of hazardous substances (Ref. 19). The cleanup will be performed to assist the college in acquiring the property.

State Landfill and/or Solid Waste Disposal Sites within one-half mile

The property does not have any listed state landfills within one-half mile of the site (Ref. 16). Southern Oklahoma Regional Disposal Landfill is the nearest landfill located in Ardmore, OK (Ref. 20)

State Leaking Underground Storage Tank (LUST) List within one-half Mile
There are no LUST sites within one-half mile of the site. The UST Notification Database maintained by the Oklahoma Corporation Commission has no LUST sites listed within one-half mile of the Tishomingo Armory (Appendix C).

State Registered Storage Tank Lists (property and adjoining properties)
There the only UST located within a one-half mile radius of the site is the armory's 1000 gallon diesel UST which was closed in 1997. This information was obtained from the UST Notification Database maintained by the Oklahoma Corporation Commission (Appendix C).

State Institutional Control/Engineering Control Registries (property only)
The subject property is not listed in any institutional/Engineering control Registries (Ref. 7).

State Voluntary Cleanup Sites and Brownfield Sites within one-half mile
The property does not have any State Voluntary Cleanup Sites or Brownfield Sites listed in the DEQ database within a one-half mile radius (Ref. 7).

5.2 Additional Environmental Record Sources

No additional environmental record sources were checked for this Phase I Targeted Brownfield Assessment.

5.3 Physical Setting Sources

Physical Setting sources were obtained from the U.S. Geological Survey, Federal Emergency Management Association, United States Department of Agriculture Soil Conservation Service Soil Survey of Johnston County, Oklahoma, and site visits conducted September 6, 2006.

5.4 Historical Use Information on the Property

The Tishomingo Armory was built in 1936 as part of a national Works Progress Administration (WPA) armory-building program. The Armory was managed and maintained by the Oklahoma Military Department to support the military mission of the Oklahoma Army National Guard (OKARNG). It served as a training site for the component and stored those materials required by the component. The OKARNG is a component of the United States Army and fulfills the military mission of national security. The building is currently listed on the National Register of Historic Places (Ref. 7).

The drill floor area was used by Murray State College in cooperation with the National Guard on occasion for large social functions. The building was occupied by the Oklahoma National Guard until approximately 2001. The Armory sat vacant until

approximately 2003 when the building was occupied by the Murray State College maintenance department.

An aerial photograph from 1940 shows the subject property directly southeast of the Murray State College campus surrounded by farm and grazing land (Appendix C).

5.5 Historical Use Information on Adjoining Properties

Aerial Photo Review

Archive aerial photographs of the subject property were reviewed at the Oklahoma Department of Libraries. The only photograph available at the library of the area is dated March 3, 1940. The photo shows the armory a ¼ mile running track immediately north of the armory. The armory is surrounded by farm and ranch land. The parking lot, an old concrete pad on the east side of the armory, and fencing were not present at this time (Appendix C).

Photographs from the DEQ website dating from 1995 and 2003 were also reviewed. These photographs show the track seen in the 1940 photograph has been developed with office buildings and parking lots. Much of the farmland to the north has been developed with residential housing and commercial offices. The total area of cleared farmland to the west, south, and east has reduced and reverted to forested land. These aerial photographs containing the Tishomingo Armory can be found in Appendix C.

Zoning/Land Use Records Review

No zoning/land use records were reviewed while conducting this Phase I Targeted Brownfield Assessment of the Tishomingo Armory.

Fire Insurance Maps

The Tishomingo Armory is located in south Tishomingo. There were no fire insurance maps available for this area (Ref. 7).

Property Tax files

No property tax files were reviewed while conducting this Phase I Targeted Brownfield Assessment of the Tishomingo Armory.

City Directories

No city directories were reviewed while conducting this Phase I Targeted Brownfield Assessment of the Tishomingo Armory.

Building Department Records

No building department records were reviewed while conducting this Phase I Targeted Brownfield Assessment of the Tishomingo Armory.

Interviews

An interview with the Murray State College Director of Plant and Technology, Gary Cook, was conducted during the site visit. Information on the interview is located in Section 7.3, "Interviews with Operators and Occupants of the property."

6.0 Site Reconnaissance

6.1 Methodology and Limiting Conditions

A site meeting at the Tishomingo Armory was performed on September 13, 2006. DEQ representative, Jarrett Keck met at the armory with a representative of Murray State College. The site reconnaissance consisted of an inspection of the armory building and its surrounding property. The indoor firing range area, mess hall, drill room, offices, and other miscellaneous rooms were inspected.

6.2 General Site conditions

Access to the site is controlled by a chain-linked fence. A pole mounted transformer is located across the street on the west side the armory. A gas meter is located on the west side of the armory building. No wells were observed on the site. The main water supply comes directly from the Murray State College water treatment plant. Drainage at the site is towards the east. Roof drains on the armory are located on the west and south side of the building. A sewer manhole is located on the northwest side of the armory property. A concrete foundation and evidence of a former structure is found on the east side of the property on the northeast corner of the parking lot (Ref. 7).

6.3 External observations

The exterior is generally in good condition. The original windows were replaced by the National Guard before the building was occupied by Murray State College and are generally in good condition with a few exterior storm windows broken by vandals. The window vent to the IFR is located on the west side of the building and is secured with painted plywood. The original paint on the roof drains and doors shows signs of rust and paint chips. An F-11 fighter jet is mounted on two pedestals in a fenced enclosure immediately southeast of the armory. A concrete foundation and evidence of a former structure is found on the east side of the property on the northeast corner of the parking lot (Ref. 7).

6.4 Internal observations

Some rooms inside the building show signs of water damage from a leaking roof. A small room adjacent to the northeast corner of the drill floor shows significant leaking with deteriorated ceiling panels, water staining and mold. The room remains locked to prohibit entry. The drill floor is used to store classroom/office and maintenance

equipment. The IFR is located in the southwest corner basement and is kept locked with warning signs at the entrance. The IFR contains miscellaneous equipment and furniture left from the National Guard. The sand trap is located at the north end adjacent to a small room to the west. The roof above the sand trap is seeping water causing the IFR to become humid and musty. A paint-like surface on the stone in the IFR flakes off easily. A floor drain is located near the sand trap in the IFR and is clogged with sand and debris. At the west end of the drill floor area is the mess hall. Kitchen equipment appears to be in working order. There is acoustical ceiling, in the dining area and 12"x12" tiles flooring throughout. The area is lit with fluorescent lighting. Above the mess hall is a drill floor viewing area that appears to be in good condition. No insulation was observed. The drill floor is heated with a natural gas space heater mounted in brackets from the ceiling. A door near the northwest corner of the drill floor connects to several offices and a garage in the north half of the building. The office spaces largely contained furniture left from the National Guard. The rooms showed signs of water damage. The original paint is peeling in places throughout. Thermostats found in these rooms appeared to be several years old and may contain mercury switches. A central heating unit located in an office space in the west side appeared to be several years old and may contain asbestos. Tiles throughout the office spaces are 12"x 12" and have sighs of water damage. A garage space is located on the east end of the west half of the building. A gravity fed floor drain is located in this room. The area is used as a light maintenance/repair and storage facility (Ref. 7).

7.0 Interviews

7.1 Interviews with Past and Present Owners of the property

The property is currently occupied by Murray State College but is still owned by the State of Oklahoma. The DEQ has had several conversations regarding environmental and safety issues at the armories, with various employees of the military department. Major Joseph Merkle, Colonel James Peck, and Richard Brooks were among the individuals that the DEQ has spoken with. A meeting was held with DEQ, the Oklahoma Military Department (OMD), and Department of Central Services (DCS) on September 20, 2006, to discuss the environmental issues at the armories in the state. The OMD provided a Baseline Assessment of the property to the DEQ, and the DEQ was able to review the OMD files on the indoor firing range.

7.2 Interviews with Key Site Manager

The Director of Plant and Technology for Murray State College, Gary Cook, was interviewed during the site visit. Mr. Cook stated he worked for Murray State College for nearly 30 years. He stated the main parade room was used by Murray State College with permission from the National Guard for large social functions. He did not recall the armory ever having stored any chemicals or ever having any spills. He stated the large concrete slab on the west side of the building had been there as long as he had worked

there and did not know what the slab was used for. He stated the National Guard vacated the armory in approximately 2001, and it sat vacant until 2003 when the College began utilizing the facility for storage space. During the two year period that the armory was vacant, some vandalism occurred (breaking of windows). He stated Murray State College had not modified or performed any renovations on the building since they had occupied the building. He added that the college only utilizes the space to store furniture, maintenance, and office equipment (Ref. 7).

7.3 Interviews with Operators and Occupants of the property

See section 7.2

7.4 Interviews with State and/or Local Government Officials

No state or government officials were present during the site visit. Interviews with OMD representatives are discussed in section 7.1.

7.5 Interviews with Others

No additional interviews were conducted during the site visit.

8.0 Findings

This Phase I Targeted Brownfield Assessment of the Tishomingo Armory was performed in accordance with the ASTM E 1527-05, a guide for conducting Environmental Site Assessments. DEQ representative, Jarrett Keck performed the site reconnaissance on September 9, 2006.

The site is located on the grounds of Murray State College at 500 East 24th Street in Tishomingo, Oklahoma, Johnston County. The main entrance to the armory is located at latitude 34° 13' 23.23", longitude -96° 40' 33.87". The property consists of 0.69 acres of land. The legal description is as follows:

> *A tract of land located in the West half (W1/2) of the Southeast quarter (SE1/4) of section 9, Township four (4) South, range (6) East, of the Indian Base and Meridian, described as follows: The starting point being one hundred (100) feet West and seventy-five (75) feet South of the Northeast (NE) corner of the West half (W1/2) of the SE quarter (SE1/4), thence West two hundred (200) feet, thence South one hundred fifty (150) feet, thence East two hundred (2000 feet, thence North one hundred fifty (150) feet to the place of beginning, together with all improvements thereon and the appurtenances thereunto belonging, and warrant the title to same.*

A cursory summary of findings is provided below. However, details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein.

- The indoor firing range (IFR) sand trap and dust residue is assumed to have lead contamination. Past sampling of the drill floor adjacent to the IFR entry indicate elevated lead concentrations are present in the building. Lead dust may also have contaminated the shallow soils outside the IFR vent window.

- Water from a seep in the IFR roof may drain into the floor drain is located in the middle of the firing range (IFR). The drain may discharge lead contaminated water from the IFR into the sewer system.

- Water infiltration through the concrete roof into the IFR has seeped and various rooms throughout the armory has caused the rooms to become humid and may potentially cause the growth of mold.

- Mercury switches may be present in thermostats, lighting and other building process equipment.

- The original paint in the armory remains in most areas of the building and has began chipping in some areas. Due to the timeframe the building was constructed, lead based paint may have been used.

- Soils below the windows may have been contaminated with lead based paint chips.

- The original heating equipment, roofing materials, and flooring historically used in the armory may contain asbestos.

- Polychlorinated Biphenyls (PCBS) may be present in electric equipment such as lighting ballasts, transformers, and capacitors installed prior to 1977.

- One 1,000-gallon underground storage tank (UST) was once located on the premises of the armory. The UST contained diesel fuel. After soil samples confirmed that no contamination resulted from the UST, the case was closed in 1997 under Oklahoma Corporation Commission (OCC) regulations.

9.0 Opinion

Based on the findings of this assessment, the DEQ recommends that additional investigation be conducted to evaluate areas of the property that may need future clean up and remediation.

Areas of additional evaluation and potential remediation consist of the following:

- The indoor firing range (IFR), IFR floor drain, adjacent interior areas, and soils outside the IFR vent window
- Due to the age of the building heating equipment, roofing, surfacing materials, insulation, and flooring should be evaluated for asbestos.

- The original paint used in the building as well as soils around exterior painted areas should to be tested for lead.

10.0 Data Gaps

No samples were collected during this investigation. Due to the age of the building, some equipment and building materials are assumed to contain hazardous materials until sampled and analyzed.

11.0 Conclusions

A Phase I Targeted Brownfield Assessment in conformance with the scope of work and ASTM Practice E 1527-2005 was performed on the subject property. This assessment revealed recognized environmental conditions that may need additional investigation and remediation of the subject property before future transfer of ownership can take place. The information provided in this assessment is to assist Murray State College in its redevelopment 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).

12.0 Additional Services

No additional services were provided in this Phase I Targeted Brownfield Assessment other than the lead results of the IFR given in Section 3.2, "Other Known or Suspected Environmental Concerns on the Site." In addition to the Phase I Targeted Brownfield Assessment, the DEQ will assist the city with removal of the environmental contaminants and ensure that the property is ready for redevelopment.

13.0 Deviations

Tax files, City Directories, Tribal Records, and Building Department Records were not examined for this investigation. No other deviations and deletions from E 1527-05 were made for this Phase I site investigation.

14.0 References

1. U.S. Environmental Protection Agency. (2001). Oklahoma *Brownfields Assistance Agreement (No* #VC98677601*)*. July 19, 2001. 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. United States Department of Agriculture, Soil Conservation Service (1979). *Soil Survey of Johnston County, Oklahoma. April 1979.* U.S. Government Printing Office: Washington, D.C.

6. U.S. Geological Survey. *Reconnaissance of the Water Resources of the Ardmore and Sherman Quadrangle, Central Oklahoma*, Hydrological Atlas 3. The University of Oklahoma, Norman, OK. (1974).

7. Jarrett Keck (2006). Field Notes for Site Reconnaissance of the Tishomingo Armory, September 6, 2006.

8. Federal Emergency Management Association (FEMA). https://msc.fema.gov.

9. Oklahoma Corporation Commission (OCC) list of Regulated Utilities. http://www.occ.state.ok.us/Divisions/PUD/RegUtilities/REGCOMPS.HTM

10. State Landfill site list: http://www.deq.state.ok.us/LpDnew/swindex.html.

11. Oklahoma Water Resources Board. http://www.owrb.state.ok.us/wd/search/search.php.

12. Emergency Response Notification System: http://www.nrc.uscg.mil/foia.html.

13. Oklahoma Army National Guard. *Indoor Firing Range Lead Issues Report.* C.H. Guernsey & Company. (2004).

14. Oklahoma Military Department Environmental Office (OKDE-ENV). Limited Environmental Baseline Assessment, Tishomingo Armory. March 13, 2006.

15. EPA NPL list: http://www.epa.gov/superfund/sites/npl/ok.htm.

16. CERCLIS current and archived sites: http://cfpub.epa.gov/supercpad/cursites/srchsites.cfm.

17. RCRA database: http://www.epa.gov/enviro/html/rcris/rcris_query_java.html.

18. RCRA NOTIFIERS sorted by county and then city: http://www.deq.state.ok.us/LPDnew/HW/Notifiers/notifiersbycountycity.pdf.

19. State Hazardous Waste Sites: http://www.deq.state.ok.us/LPDnew/hwindex.html.

20. DEQ Dataviewer: http://maps.scigis.com/deq%5Fwq/.

15.0 Environmental Professional(s) Statement

See Page 2.

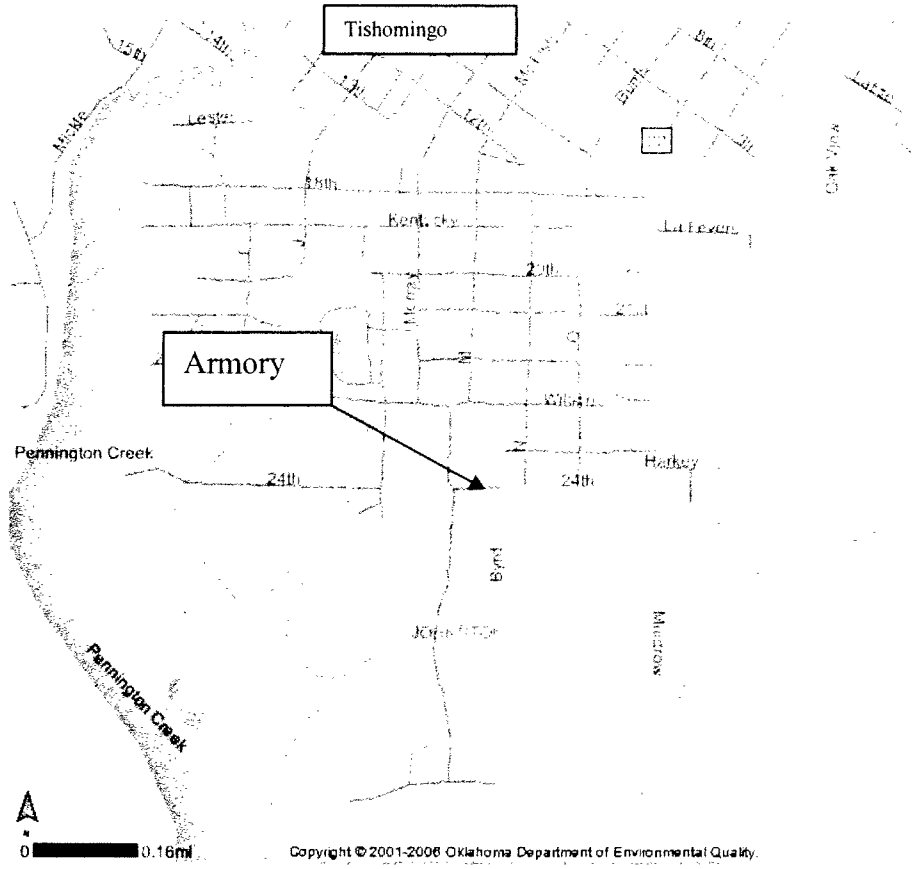
16.0 Signature(s) of Environmental Professional(s)

See Page 2

17.0 Appendices

Appendix A - Site (Vicinity) Map
Appendix B - Site Photographs
Appendix C - Historical Research Documentations
Aerial Photographs
Topographical Map
Appendix D - Interview Documentation
Appendix E - Qualification(s) of Environmental Professionals
Appendix F - Analytical Results of Indoor Firing Range and Tile

Appendix A - Site (Vicinity) Map



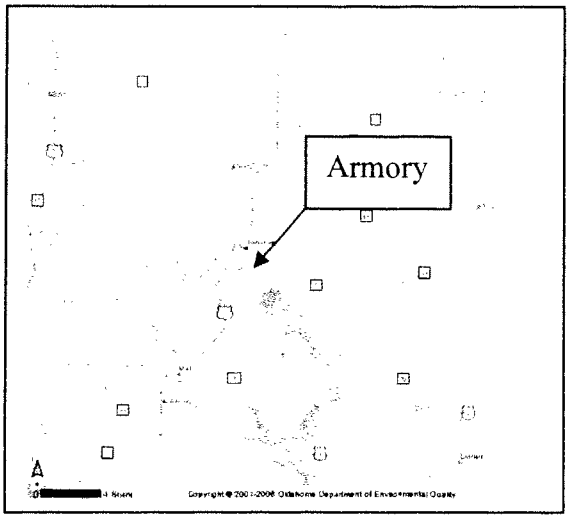


Figure 1. Site Vicinity Map

Figure 1. Site Vicinity Map

Appendix B - Site Photographs

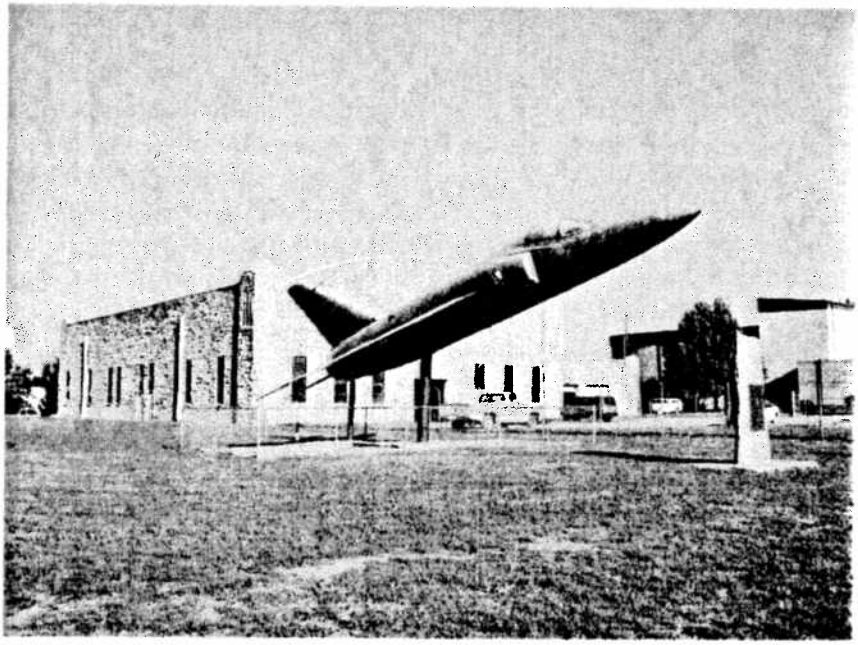


Figure 1: East side of armory facing northwest.

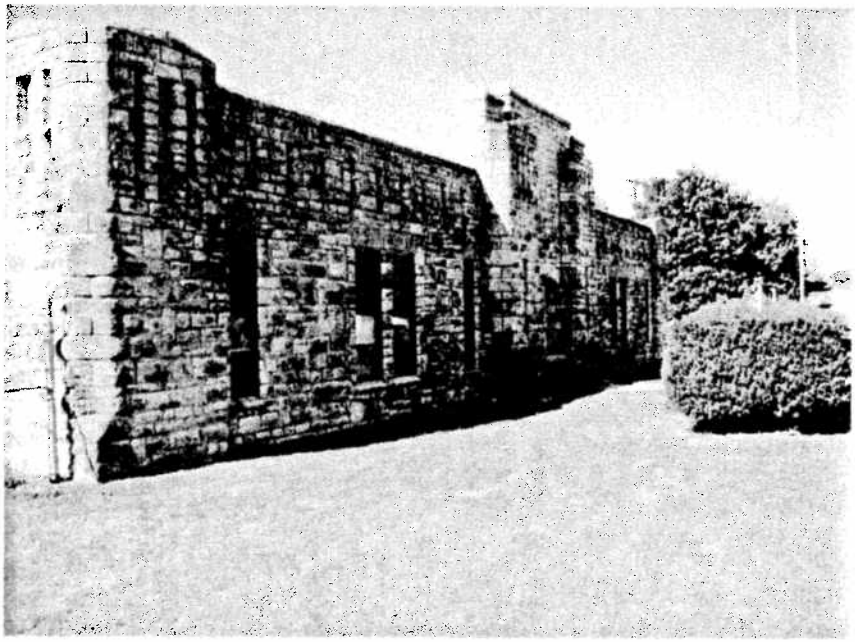


Figure 2: North side of armory (main entrance) facing west-southwest.

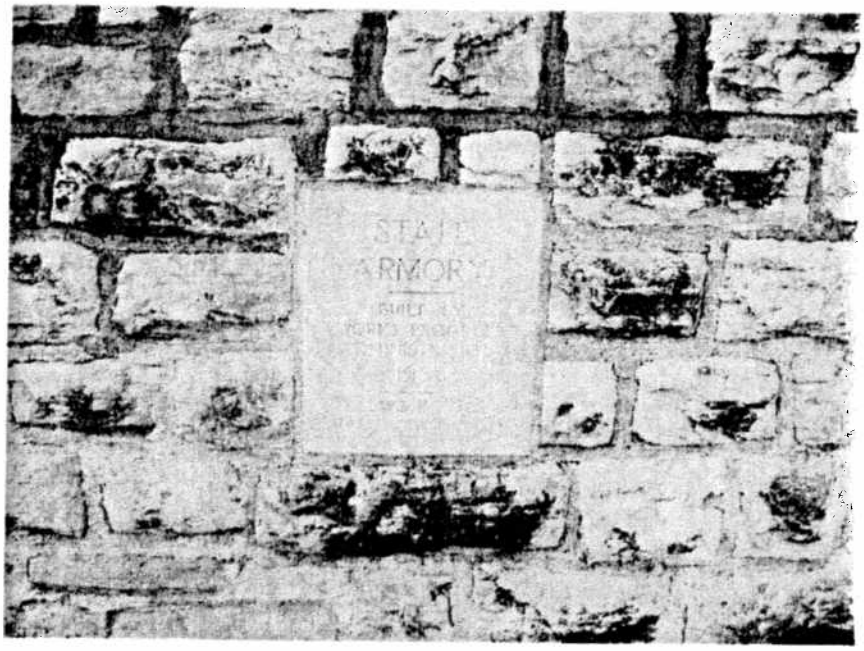


Figure 3: Placard on northwest side of building.

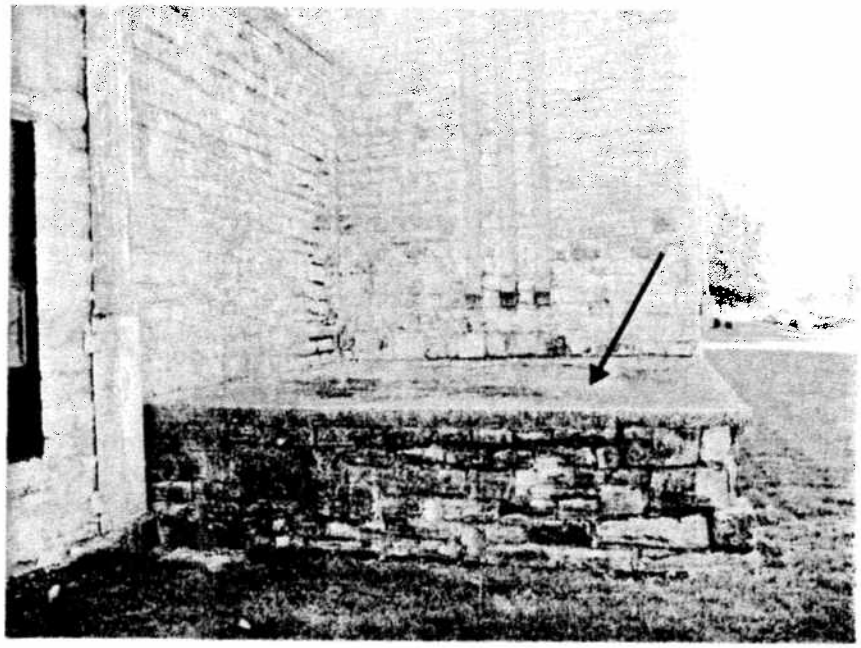


Figure 4: West side of armory showing roof of the IFR.

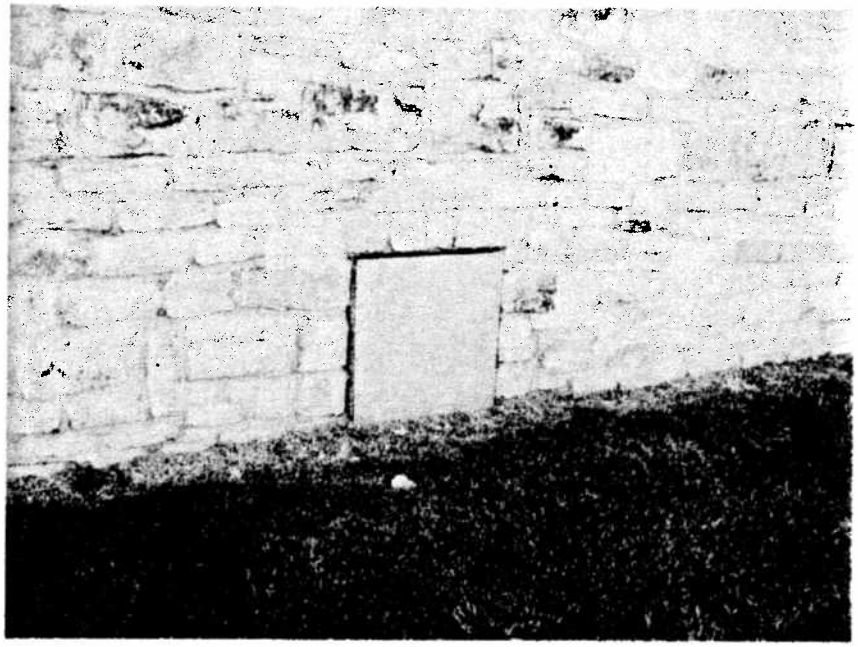


Figure 5: West side of armory showing IFR vent window boarded up.

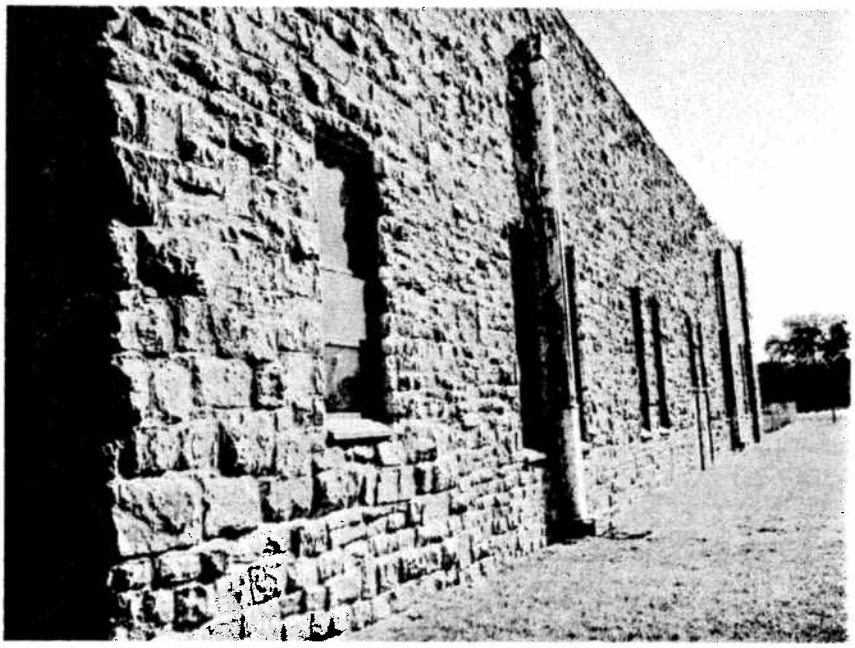


Figure 6: South side of armory facing east.

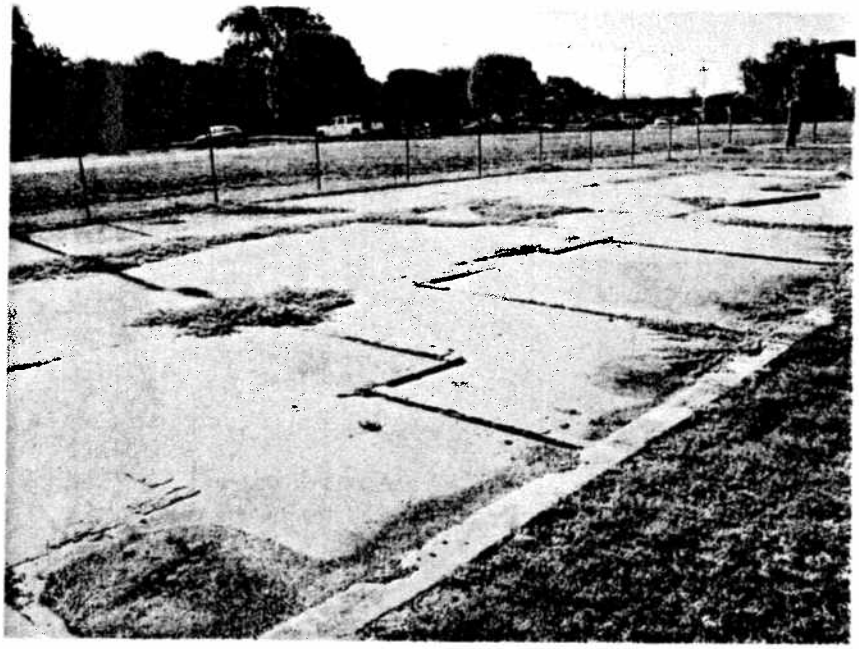


Figure 7: Concrete foundation pad on northeast side of property.

Figure 8: Drill floor facing west showing typical storage use.

Figure 9: Room off northeast side of the drill floor showing water damage.

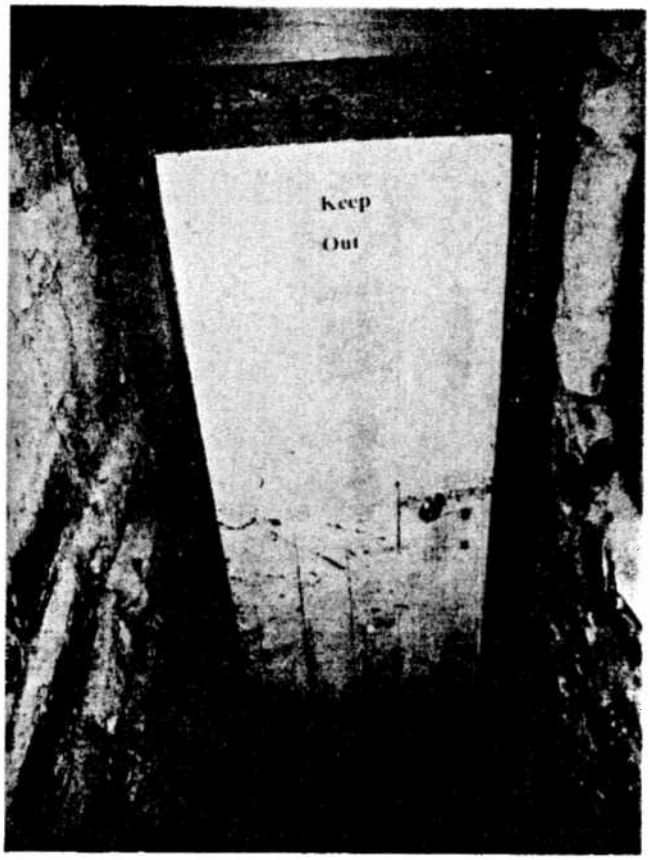


Figure 10: Entrance to IFR showing keep out sign.

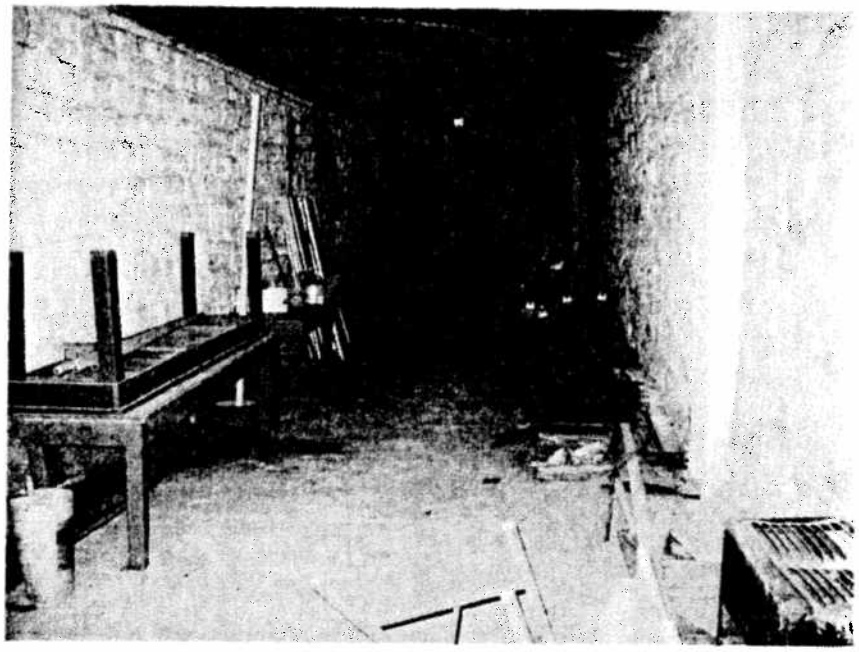


Figure 11: IFR facing north.

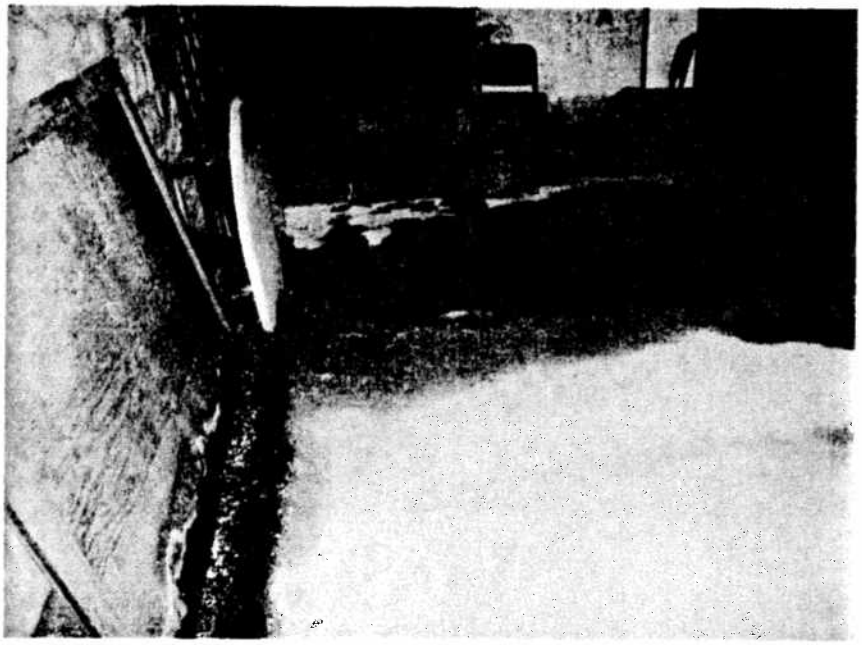


Figure 12: North end of IFR showing water seep (sand trap in background).

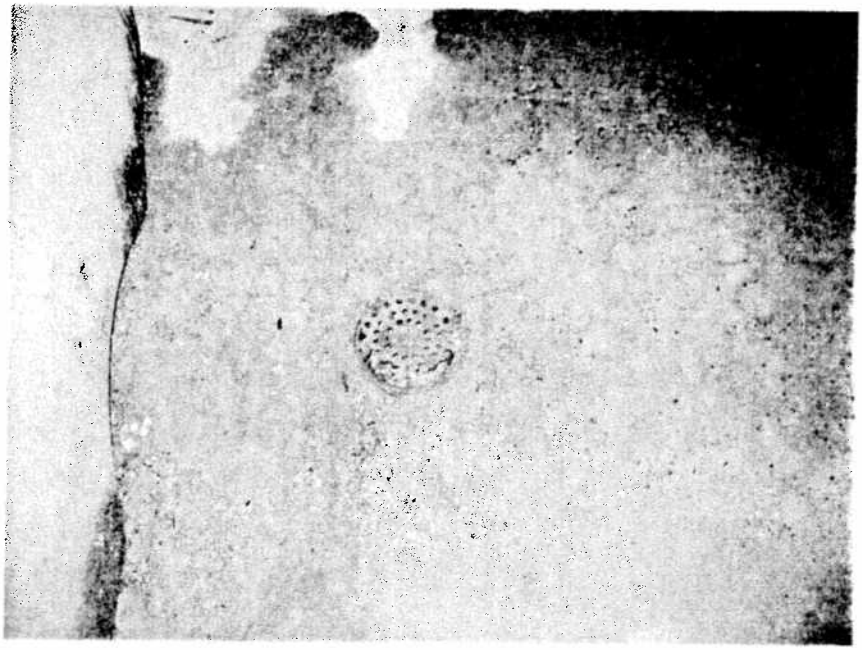


Figure 13: Floor drain at north end of IFR clogged with sand.

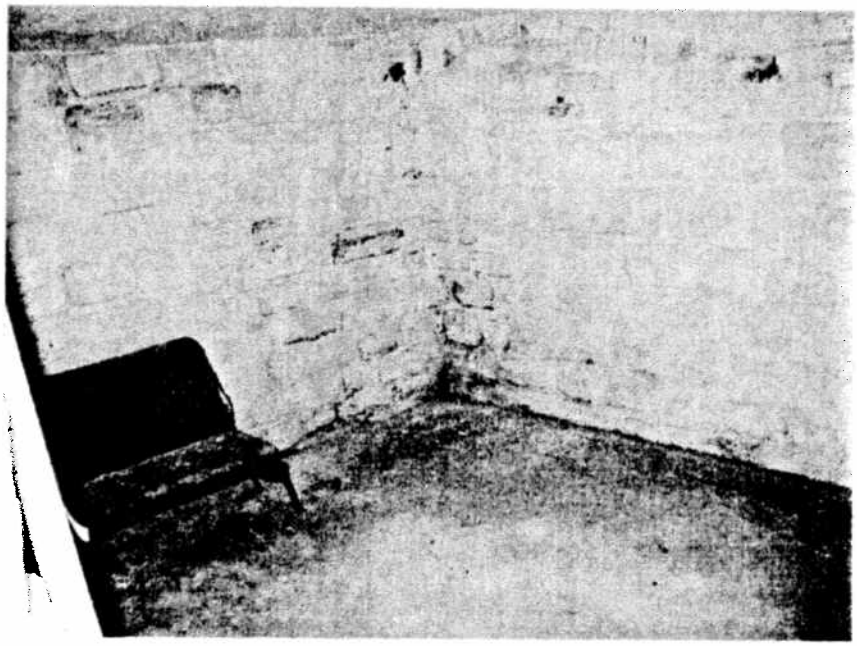


Figure 14: Room at northeast end of IFR.

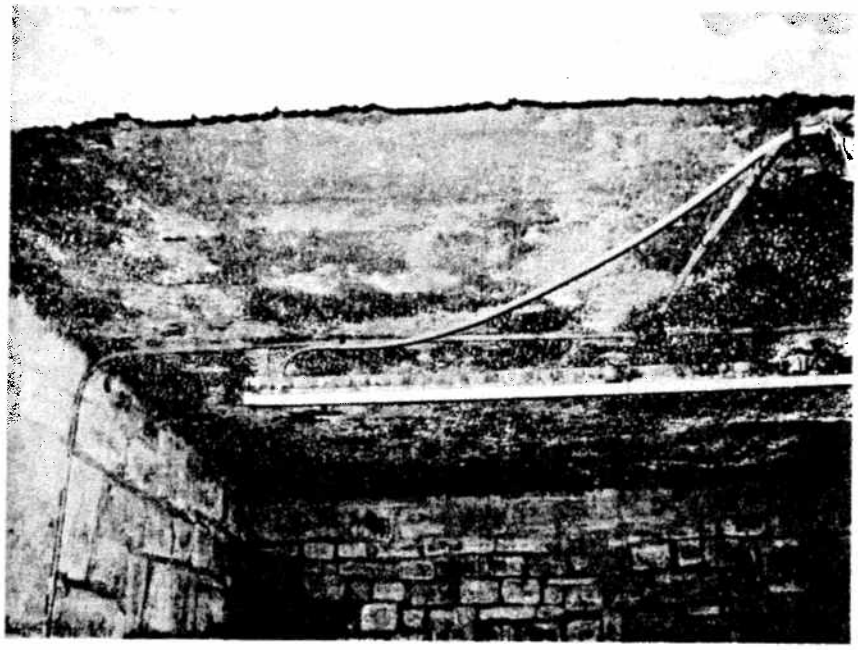


Figure 15: Water seep from roof of IFR at north end.

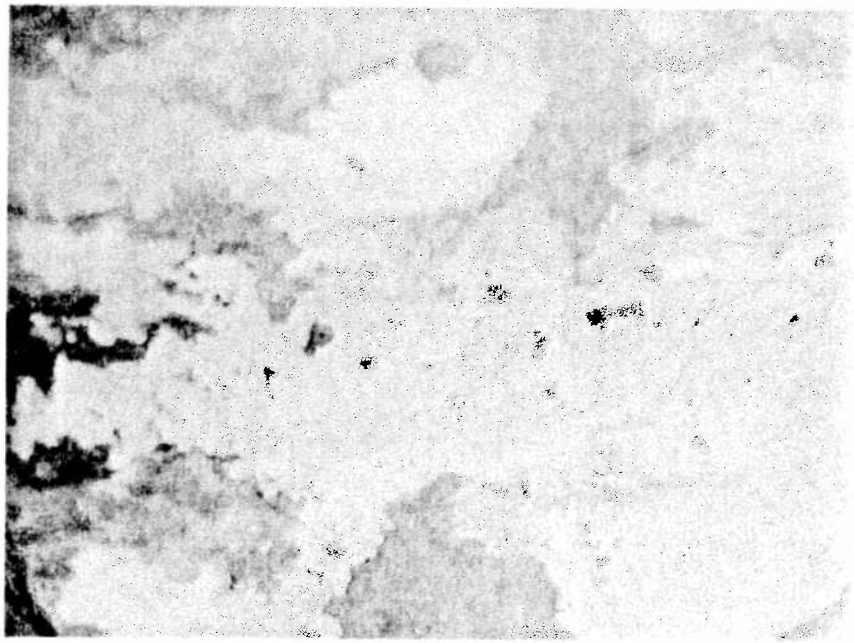


Figure 16: Flaked paint-like surface at north end of IFR.

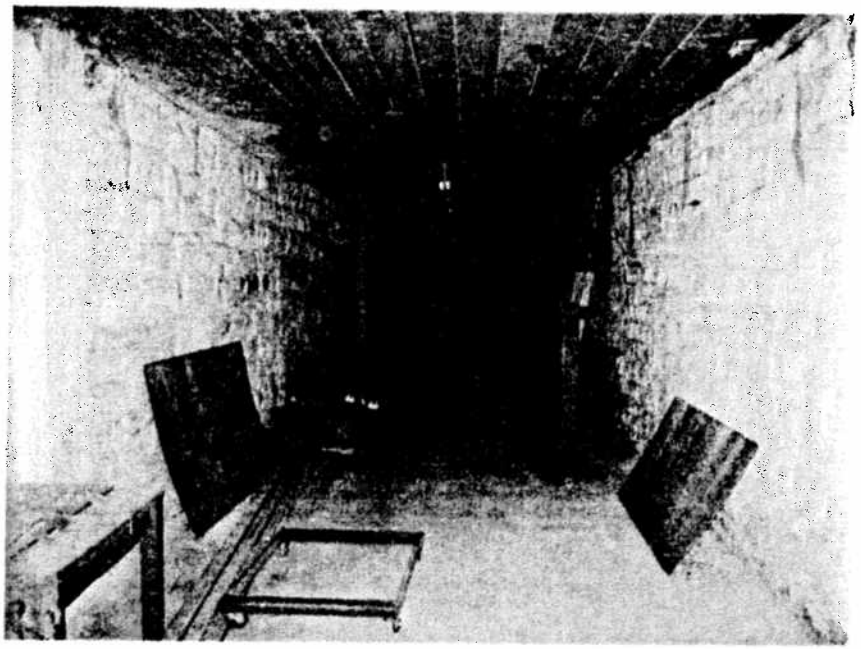


Figure 17: North end of IFR looking south.

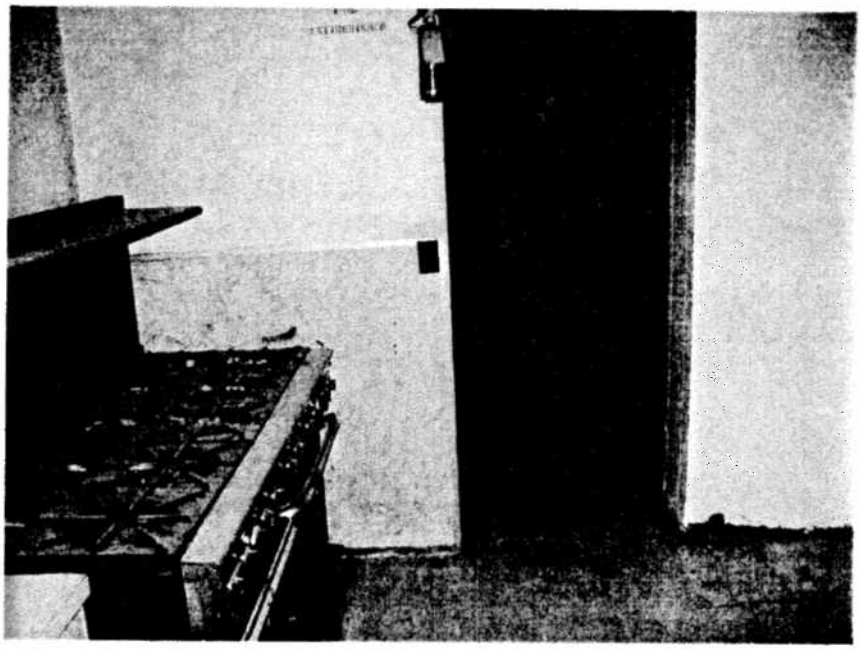


Figure 18: Kitchen area of mess hall showing 12" x 12" floor tile.

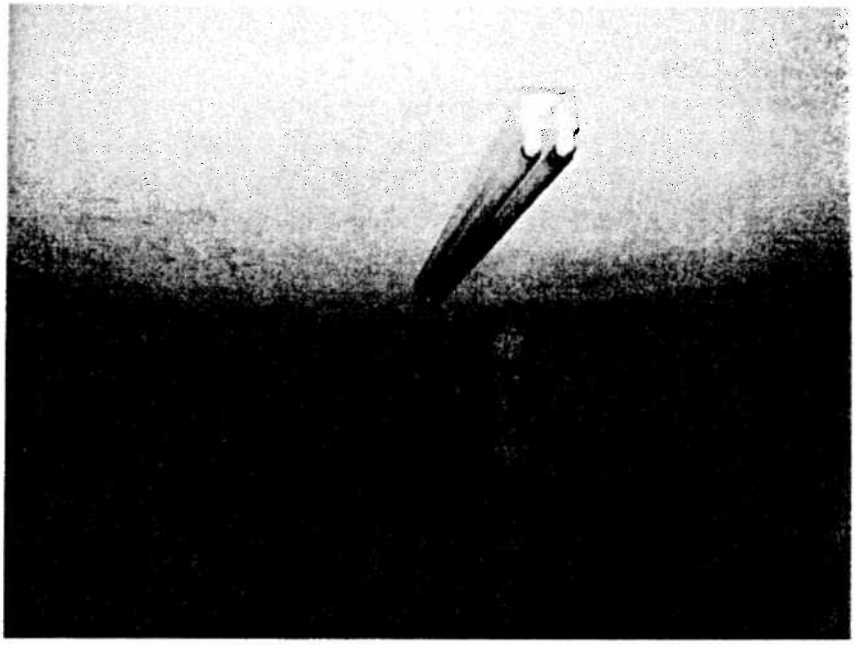


Figure 19: Mess hall area showing acoustic ceiling.

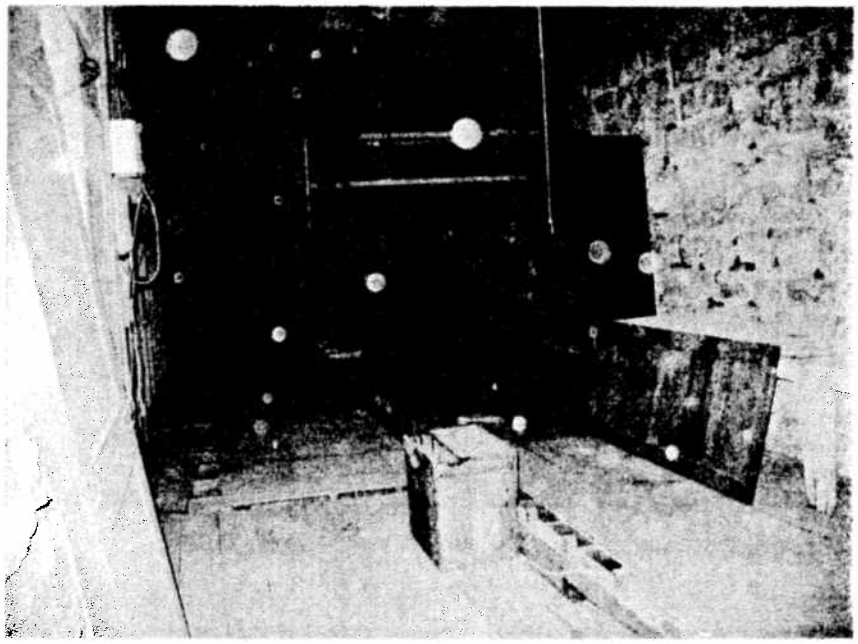


Figure 20: Viewing area above drill floor.

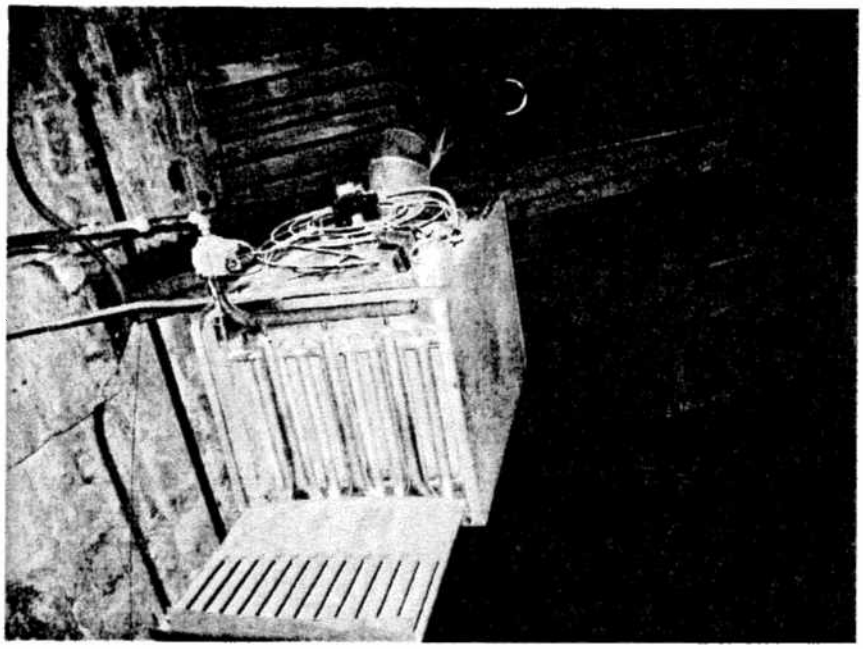


Figure 21: Bracket mounted space heater in the drill floor area showing access panel open.

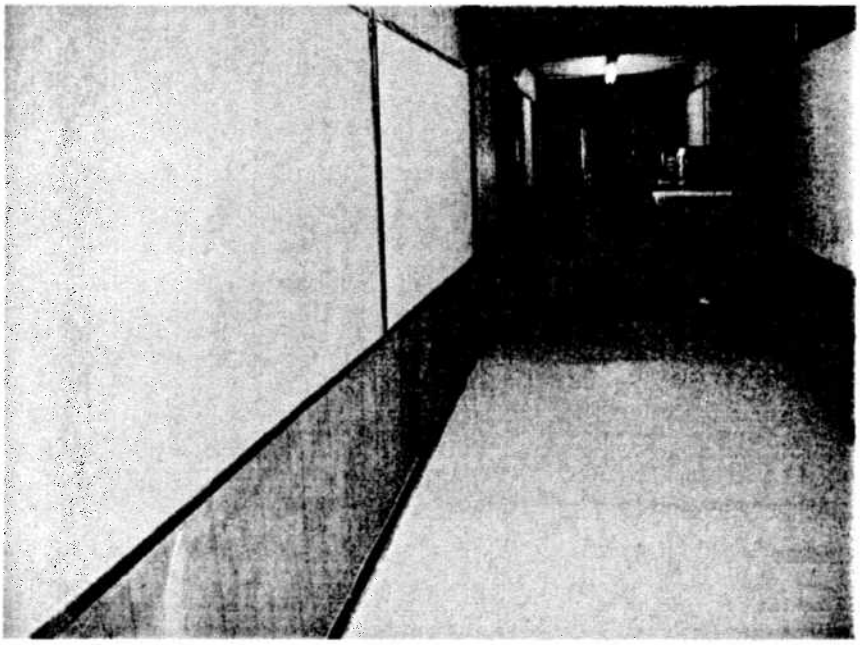


Figure 22: Hallway entrance from the drill floor looking north.

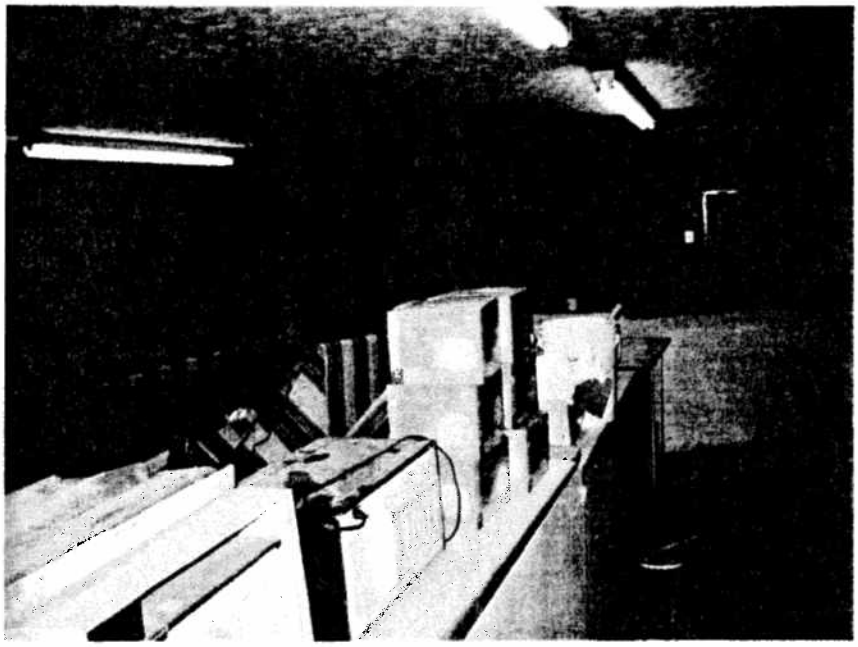


Figure 23: Typical use of office space to store miscellaneous items.

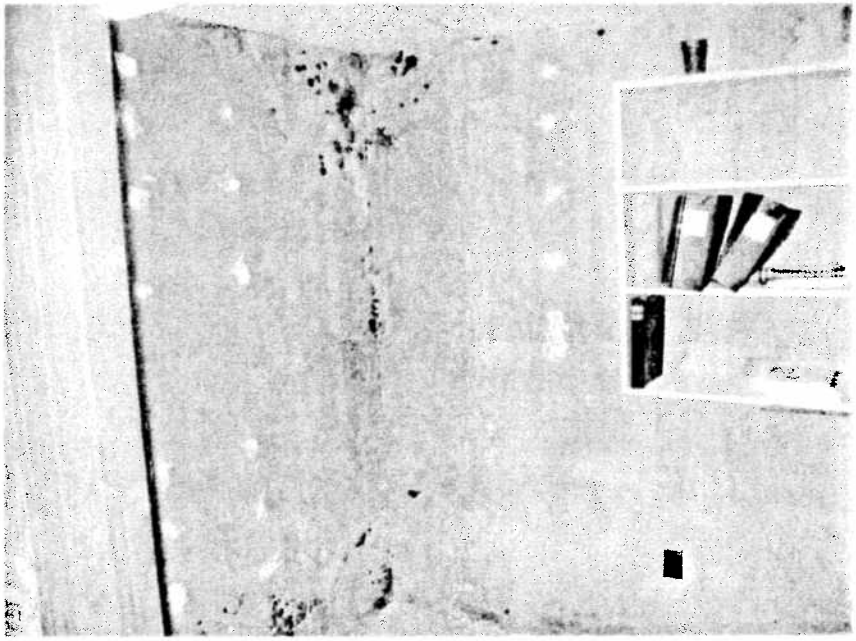


Figure 24: Water and mold damage in the west side office area.

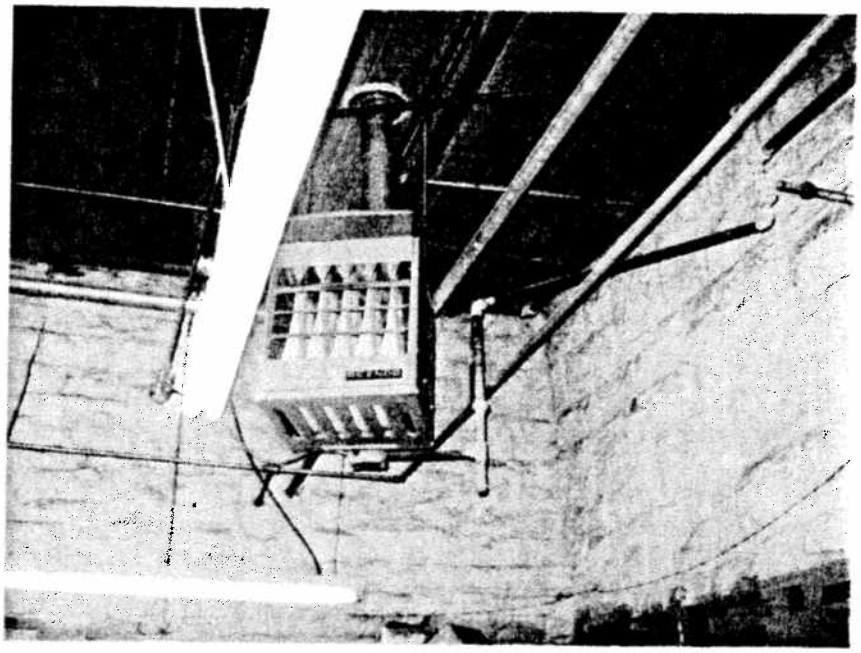


Figure 25: Bracket mounted heater in the garage bay area.

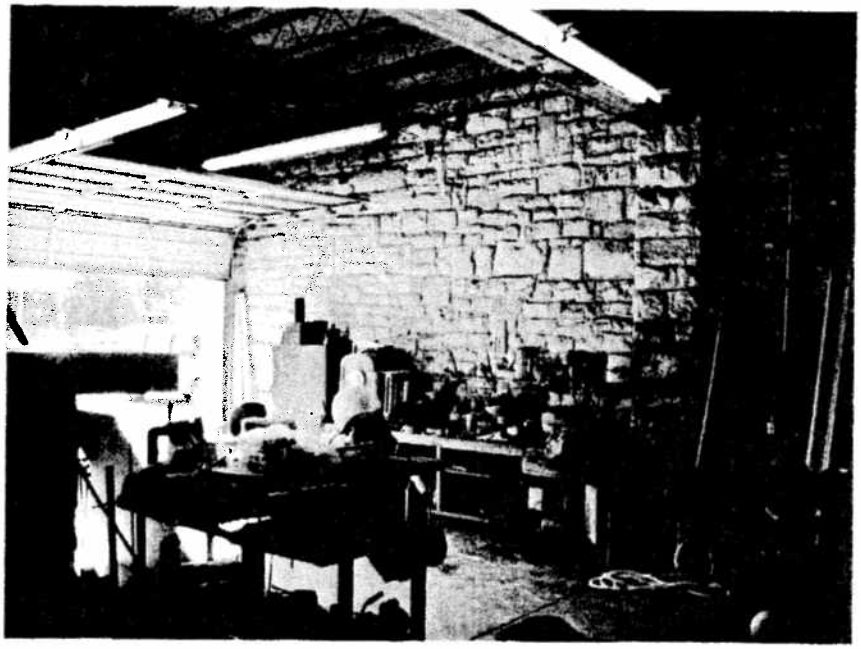


Figure 26: Garage bay area in the east side of the building.

Appendix C - Historical Research Documentations
Aerial Photographs
Topographical Map

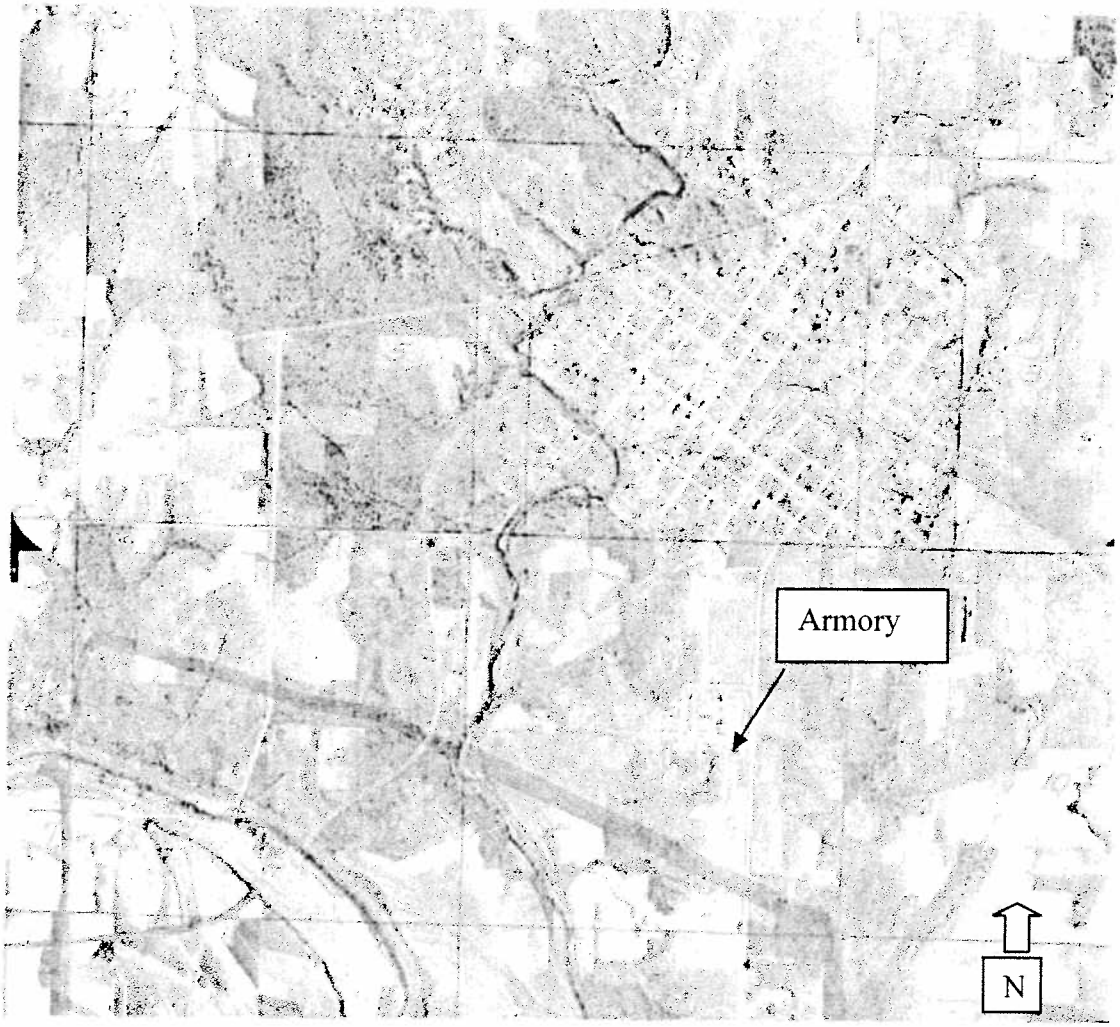


Figure 1: Aerial Photograph of Tishomingo taken March 3, 1940

Figure 2: Aerial Photograph of Tishomingo taken in 1996.

Figure 3: Aerial Photograph of Tishomingo taken in 2004

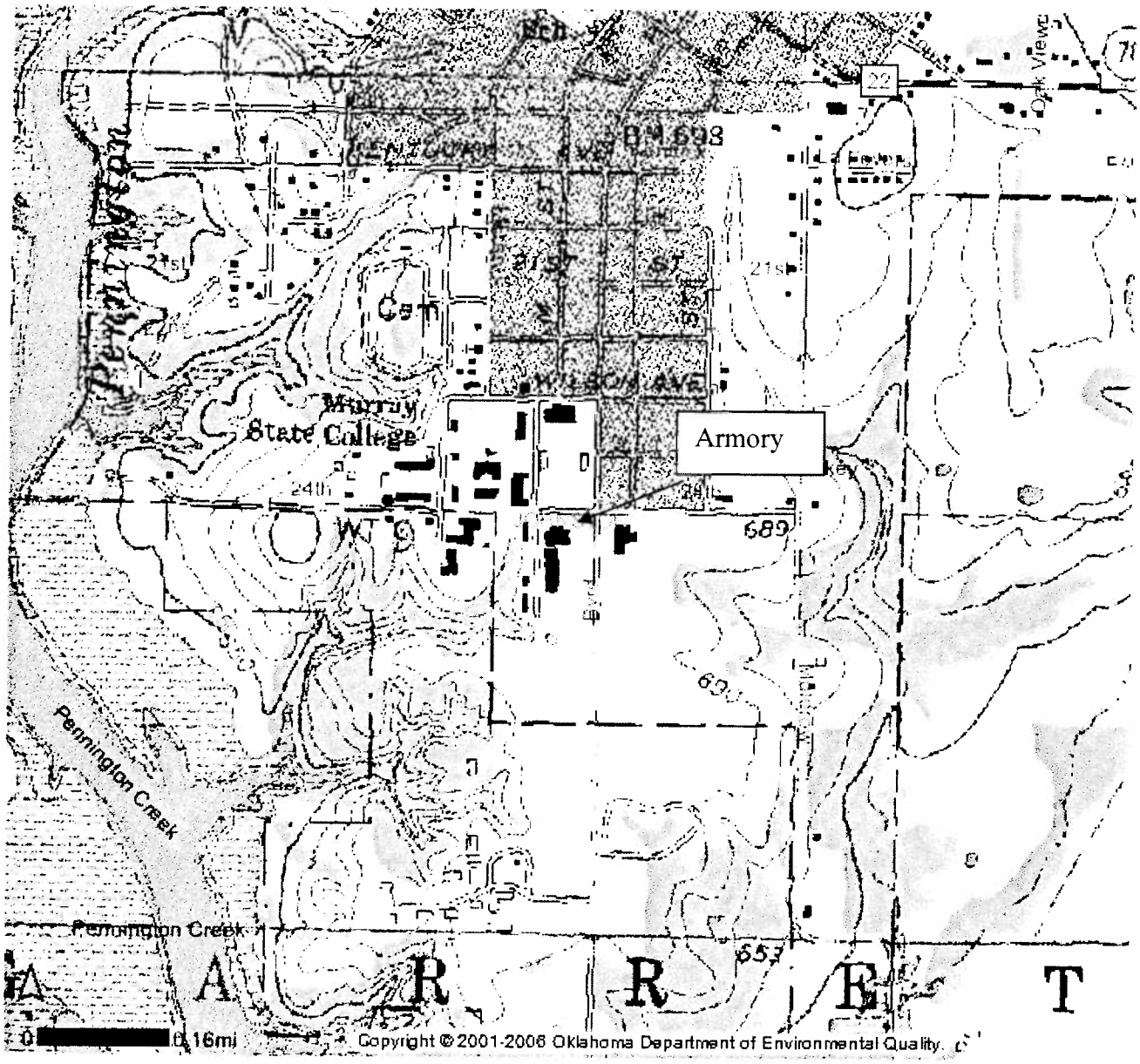


Figure 4: USGS Topographic map of Tishomingo

Appendix D - Interview Documentation

AAI Site Visit

Facility name: Tishomingo Armory

Facility address: 500 E 2ND ST
ATRAC IN NE NE SE 39 R4GE Box 246 Pg 57

Date of visit: 9-6-06

DEQ staff in attendance: JARRETT KECK

People interviewed/affiliation with site: GARY COOK
MAINTENANCE OFFICER

Note: Take a copy of the facility map with you to mark where drains, utilities, and sampling locations are located

Military Department Property

Y Military Department Property is left in the armory

Items left in armory: DESKS, SHELVING, KITCHEN EQUIP

Radiators

N Radiator present in armory

List room(s) located in:

Florescent lighting

NO Florescent lighting present above current ceiling? (ie. Above drop ceiling)

List room(s) located in: OFFICES, MESS HALL

General Site conditions:

External observations

N Stained soil or pavement N Stressed vegetation N Solid waste

Other:

Internal observations

N Odors Y Pools of liquids N Drums

U Stains or Corrosion on floors, walls, or ceilings
WATER DAMAGE IN FIRE + OFFICES

Other:

General notes:

Additional Environmental Record Sources

City Records: e.g. Material Safety Data Sheets for chemicals used at industrial or commercial facilities Land Use Restrictions

NA

Physical Setting Sources

USGS DRG

Historical Use Information on the Property

Previously owned by OK Dept of Agriculture Since Donated to the YCEM

Historical Use Information on Adjoining Properties

Farm/Ranch land / Agriculture

Site Reconnaissance

Methodology and Limiting Conditions: The method used to observe the property and limitations imposed by physical obstructions or limiting weather conditions.

Walk Through

N Farm Wastes

N Known Pesticide Misapplication

N Discharges and Runoff from Adjacent Property Affecting the Site

Y Transformers/PCB Equipment *Location:* [illegible]

Describe:

Other known or Suspected Environmental Concerns On the Site

LEAD IN PAINT

[illegible]

Historical Recognized Environmental Conditions On the Site

UST

LPST

Current Use of the Property

Descriptions of Structures, Roads, Other Improvements on the Site

[illegible]

Description of adjacent properties

SEE PG 2

Owner, Property Manager, and Occupant Information

[illegible]

Utilities

✓ ~~City~~ water ___Well ✓ City sewer ___Septic tank

___Natural gas ___Propane

Underground features

NO USTs removed NO Vent pipes present ✓ USTs not removed

Above ground features

✓ Cisterns present ✓ ASTs ✓ Impoundments

Structures on adjoining property

Residential, commercial structures, churches, schools etc

Onsite information

✓ Air Emissions ✓ Wastewater Discharge

Industrial activities

✓ Monitoring wells *Location:*

✓ Stained soils *Location:*

✓ Seeps *Location:*

✓ Chemical spills *Location:*

✓ Oil and Gas Exploration *Describe:*

✓ Known Groundwater or Surface Water contamination

Describe:

Appendix E - Qualifications of Environmental Professionals

Appendix E – Qualifications of Environmental Professionals

Jarrett Keck holds a Bachelors of Science Degree in Environmental Engineering Technology from California State University Long Beach. He is an Environmental Programs Specialist for the Land Protection Division of the Oklahoma Department of Environmental Quality. His duties include providing technical and regulatory oversight in the Voluntary Cleanup and Brownfield programs. Mr. Keck has over five years of experience in the environmental field performing Phase I/ II Environmental Site Assessment activities, various site remediation technologies, and providing regulatory oversight for state and local government.

Rita R. Kottke, Ph.D., holds a Doctorate in Environmental Science from Oklahoma State University. She is an Environmental Programs Specialist with the Land Protection Division of the Oklahoma Department of Environmental Quality. She functions as the DEQ's Brownfield Coordinator, Brownfield Cleanup Revolving Loan Fund Contact, Superfund Site Redevelopment Contact, Superfund Emergency Response Contact, Land Revitalization/Reuse Contact, and as a liaison between the state, EPA, and local communities. Her responsibilities also include acting as technical project manager at various Voluntary Cleanup and Superfund sites within the state. She has been with the agency for thirteen years, working in the Superfund and Brownfield Programs. She has 13 years experience performing site assessments of real property. She was heavily involved in the formulation of the Brownfields Program's implementing rules, the negotiation of DEQ's Brownfield Memorandum of Agreement (MOA) with EPA, and the development of the Brownfield Cleanup Revolving Loan Fund Grant Proposal.

Hal Cantwell holds a Bachelor Degree in Geography with emphasis in Physical Geography and ecological form the University of Oklahoma, and a Masters Degree in Geography with emphasis in Biogeography and Remote Sensing from the University of Oklahoma. Mr. Cantwell has 21 years experience working in the Superfund program including directing the investigation and remediation of National Priority List (NPL) sites. He has 21 years experience in performing site assessments and eleven years experience in directing and supervising CERCLA Preliminary Assessments and Site Investigations with the Oklahoma Department of Environmental Quality Land Protection Site Assessment Unit. He also has eleven/ years experience performing and supervising Targeted Brownfield Assessments under the DEQ Brownfields Program.

Appendix F - Analytical Results of Indoor Firing Range

46.0 TISHOMINGO ARMORY

C.H. Guernsey & Company (GUERNSEY) surveyed the indoor firing range (IFR) at the Tishomingo Armory on January 11, 2005 (Photographs 46-1 through 46-25). The IFR is approximately 100 feet long, approximately 13 feet wide, and the ceiling is approximately 12 feet high. It is located subgrade. At one end is a backstop and bullet trap. Adjacent to the backstop is an approximately 11-foot by 24-foot target room. The ventilation system within the IFR is comprised of a fan located in the ceiling and vented directly outside. There is evidence of water damage within the IFR space.

Based upon information supplied to GUERNSEY, Oklahoma Military Department (OMD) personnel collected one wipe sample from the drill floor on April 8, 2004. Concentrations on the drill floor were 146 µg/ft². No samples were obtained within the IFR, but it is assumed to be contaminated with lead. Because of existing activities on the drill floor, it will not be cleaned. Table 46-1 summarizes the laboratory results for the wipe samples.

Table 46-1
Laboratory Analysis

Sample ID #	Sample Date	Result (µg/sq. Ft.)	Lab Report ID #
NIA	4/08/2004	146.95	NIA

Note:
NIA = No information Available

No equipment was identified for cleaning by OMD and armory personnel.

Table 46-2 provides a preliminary cost estimate to clean the equipment and/or remediate the lead contamination in the IFR. Figure 46-1 shows the approximate locations of the OMD samples.

46.1 OTHER ENVIRONMENTAL CONSIDERATIONS

Beyond the issues related to the IFR, the following environmental related issues potentially exist at the Armory:

- Asbestos containing material (ACM) is material that contains 1% or more asbestos fibers. Because of the Armory's age, there is a potential for ACM in building materials (roofing materials, floor tiles, mastic, ceiling tiles, window putty, natural gas-fired heating systems, etc);
- Lead has been used as a color carrier in paints for hundreds of years. In 1978, its use in residential paints was restricted in the United States. Because of its age, there is a potential for lead containing paints at the Armory;
- Polychlorinated biphenyls (PCB) are oils that were used in electrical equipment until their regulation in 1977. There is a potential for PCB in fluorescent lighting ballasts, capacitors, transformers and other dielectric fluid filled electrical equipment at the Armory;

- The potential for mold exists within the Armory due to a compromise of the building envelope and the presence of standing water and visible water damage;
- Chlorofluorocarbons (CFCs) are compounds used in heating, ventilation, and cooling (HVAC) systems and in fire suppression (i.e., halon) systems. The use, release and recycling of these compounds are regulated by EPA. There is a potential for CFCs to be present in the HVAC equipment and fire suppression system of the Armory;
- Mercury is a heavy metal used in thermostats, pressure gauges, and other building and process related equipment. There is a potential for mercury containing thermostats at the Armory;
- Lead, nickel, and cadmium are heavy metals used in batteries. There is a potential for heavy metal containing batteries in the emergency lighting and exit signage at the Armory; and
- Other issues may be present that were not visually evident to GUERNSEY.

Table 46-2
Preliminary Cost Estimate

Equipment Cleaning Costs (a)				
Item Description	Number	Unit	Cost Per Unit	Total Cost
Total				$0

Remediation Costs (b)				
Item Description	Number	Unit	Cost Per Unit	Total Cost
Mob/DeMob	1	Each	$1,500	$1,500
Stage/Clean Equipment/Components for Disposal	1	Each	$2,000	$2,000
Cleaning of Army Equipment (a)	N/A	N/A	N/A	$0
Clean/Seal Firing Range surfaces	6300	ft²	$5	$28,350
Waste Disposal (non-hazardous)	3	Ton	$1,000	$3,000
Total (+/- 25%)				$34,850

Notes:
(a) Includes the cleaning of equipment identified by OMD personnel during site visit. Please reference photographs for each item.
(b) Includes cleaning of firing range space, drill floor, and other surfaces to <40 ug/ft².

2. SAMPLE LOCATIONS ARE APPROX. & IDENTIFIED BY •
3. SAMPLE CONCENTRATIONS ARE IN MICROGRAMS PER SQUARE FOOT (UG/FT^2)
4. SAMPLES COLLECTED BY OMD PERSONNEL 08-APR-04
5. SEE PHOTOGRAPHS FOR REFERENCE
6. SEE INVENTORY LIST FOR DESCRIPTION OF EQUIPMENT TO BE CLEANED