

# **Targeted Brownfields Assessment**

**Oklahoma Army National Guard Armory  
Sulphur, Oklahoma**

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

**April 4, 2008**

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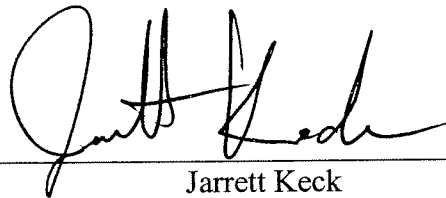
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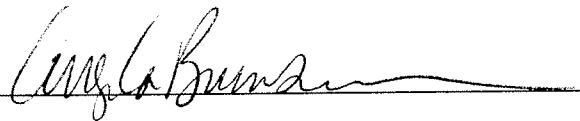
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I declare that to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Section 312.10 of this part. I have specific qualifications based on education, training, and experience to assess 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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*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 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 hazards are 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 Sulphur 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 October 10, 2007.

The site is located in lots one and six, block 93, City of Sulphur, Murray County, Oklahoma. The street address is 500 West Wynnewood in Sulphur, Oklahoma. The main entrance is located at latitude 34° 30' 36.38", longitude -96° 58' 21.82".

A cursory summary of findings is provided below. However, details are 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.

- An indoor firing range (IFR) and associated dust residue is assumed to have lead contamination based on past sampling of the IFR indicating elevated lead concentrations are present in the building. Lead dust may also have contaminated adjacent rooms and vents.
- Mercury may be present in thermostats, lighting, and other equipment in the facility. Mercury containing equipment can be used safely when it is in good working order. The equipment in the armory appeared to be in good condition during the site visit.
- The original paint on the armory remains in most areas of the building and has begun chipping in some areas. Due to the timeframe the building was constructed, lead based paint may have been used.
- Soils below exterior painted surfaces may have been contaminated with lead based paint chips.
- Due to the age of the building and period of operation, asbestos containing materials (ACM) purchased prior to 1978 may be present in the facility. ACM was typically used in heating equipment, insulation, ceiling tiles, roofing materials, and flooring.
- Polychlorinated Biphenyls (PCBS) may be present in electric equipment such as ballasts, transformers, and capacitors purchased prior to 1978. PCB containing equipment can be used safely when it is in good working order. The equipment in the armory appeared to be in good condition during the site visit.
- One 1,000-gallon underground storage tank (UST) formerly used to store gasoline was removed from the southwest corner of the property in 1993. After soil samples confirmed the UST had not impacted to adjacent soils, the case was closed under Oklahoma Corporation Commission (OCC) jurisdiction.

## **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, vent, and adjacent interior areas need additional evaluation and remediation of the lead contamination
- Asbestos containing materials (ACM) may have been used during the construction and remodeling of the facility. The heating equipment, insulation, surfacing materials and flooring should be evaluated for asbestos.
- The presence and condition of mercury containing devices and Polychlorinated Biphenyl containing electrical equipment should be evaluated.
- The original paint used in the building as well as soils around exterior painted areas should be tested for lead.

## **2.0 Introduction**

The State of Oklahoma Department of Environmental Quality (DEQ) under a Brownfield Assistance Agreement (No. RP976412010) (Ref. 1) with the U.S. Environmental Protection Agency (EPA) conducted a Targeted Brownfield Assessment of the Sulphur 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 the City of Sulphur 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 Liability 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 the City 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, governmental databases, deed records, aerial photographs, governmental environmental files, Sanborn Fire Insurance Maps, conducted interviews with past unit members, and performed 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 Sulphur Armory. Most of the State armories, such as the Sulphur Armory, have indoor firing ranges. These ranges usually contain concentrations of lead from past target shooting activities. Due to the age of the building and period of use, there is a high potential of finding Polychlorinated Biphenyl's (PCB's) in the electrical equipment and ACM in the building materials. The U.S. began banning the use of asbestos and PCB's in 1978. ACMs may be found in the insulation wrapping of the heating pipes and/or heaters and nine-inch floor tiles, which may have been installed during construction or subsequent remodeling and maintenance activities. PCBs are commonly found in electrical transformers and ballasts. Mercury containing thermostats, and 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 Sulphur Armory indicated that ACM 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 hazards 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 former guardsmen who are also residents in the community, information provided by the City of Sulphur, 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 soil, rock, groundwater, surface water, or air.

### *2.5 Special Terms and Conditions*

This assessment report has been prepared for the City of Sulphur 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 in lots one and six, block 93, City of Sulphur, Murray County, Oklahoma. The street address 500 West Wynnewood in Sulphur, Oklahoma. The main entrance is located at latitude 34° 30' 36.38", longitude -96° 58' 21.82".

### *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 surrounded by City streets. Murray County is in the Grand Prairie and Cross Timbers major land resource areas. The Washita River borders part of the northwestern area of the county and it crosses through the county at Davis, from northwest to slightly southeast. The area west of the Washita River consists of very gently sloping to steep, rocky uplands that are cut by numerous valleys and small tributaries. The northern, southern, and eastern parts of the county consist of smooth, very gently sloping to steep uplands. Flood plains are along the Washita River, and Guy Sandy, Chigley Sandy, Rock, and Mill Creeks (Ref. 5).

The typical weather of Murray County is moist sub-humid. Rainfall events can be characterized by thunderstorms, which frequently produce high intensity rainfall. The prevailing wind direction is southerly, although northerly winds are common from November through March (Ref. 5).

Timbered and prairie soils are of equal extent in the county. The native vegetation in timbered areas is mostly oaks, hickory, and red cedar with an understory of grasses. The native vegetation in prairie areas is big bluestem, little bluestem, indiagrass, switchgrass, and forbs. The general slope is toward the south and east (App. C). Elevation ranges from 750 feet above sea level, where the Washita River leaves the county, to 1450 feet, in the timbered hills in the western part of the county (Ref. 5).

Industry in Murray County includes rock crushers, trucking, concrete production, and manufacturing, ranching, and tourism. These industries are in or near Sulphur and Davis (Ref. 5).

### Groundwater

The Hydrogeologic Atlas shows water wells in the area with static water levels at 27-928 feet below ground surface (Ref. 6). The site is underlain by the Vanoss Group, which is a shale, arkose, and limestone conglomerate, and is 250-900 feet thick. Shallow groundwater probably flows to the southeast towards Rock Creek. The site is in the Arbuckle Mountain area of Oklahoma and is in the Arbuckle Simpson aquifer recharge area. The Arbuckle-Simpson aquifer is a principle groundwater source for the area. Additionally, there is artesian groundwater discharge nearby the property. The site has a complex geology due to the folding occurring during the formation of the Arbuckle Mountains. General soil permeability is low and the water capacity is high. The City of Sulphur receives approximately 38 inches of precipitation per year (Ref. 5). The town of Sulphur uses surface water and ground water for its drinking water supply. The public wells are located approximately due east and to the south of the City of Sulphur. One well located in the area is reported to encounter water at 365 feet below grade surface (BGS) and is described as flowing (artesian) at a rate of 500 gallons per minute. Water quality in this area is extremely variable (Ref. 6).

There are twenty-five reported groundwater wells located within a one mile radius of the site. Surface topography appears to gently dip towards the south and east along Rock Creek. Based on this, four domestic wells are immediately down gradient of the site. The total depths of all reported wells range from 56 to 750 feet BGS (Ref 6). After reviewing available historic information and site interviews, activities at the armory are not expected to have impacted the groundwater.

### Soils

Soils in the underlying the property are Quaternary Alluvium and terrace deposits. The deposits in this area specifically described as the Garvin-Elandco soil series. These are deep, nearly level and very gently sloping, moderately well drained and well drained, clayey and loamy soils that formed in clayey or loamy alluvium.

These soils are high in natural fertility and organic matter and have a moderate shrink-swell potential and erode easily. The rate of water movement through the soil is moderate and the available water capacity is high. These soils are prone to moderate to severe flooding. Due to this issue, engineering controls may be necessary when designing and constructing buildings or sanitary facilities. Based on visual observation and historic data, soils do not appear to be environmentally impacted by activities at this site.

#### Air

The prevailing wind is from the south-southeast. Average wind speed in the area is 8.6 miles per hour (Ref. 7). During the October 10, 2007 site visit, no odors were observed (Ref. 8). Based on a report provided by the military department (Appendix F) lead dust residue is assumed to be present in the IFR and may have affected adjacent rooms in the armory. An exhaust vent is located in middle of the east wall in the IFR and exits outside. The IFR, adjacent rooms, and vent area 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 general slope of the property is to the east and south towards Rock Creek. Rock Creek flows through the central area of Sulphur, then flows to the Lake of the Arbuckles and finally to the Red River. The Lake of the Arbuckle's supplies the City's drinking water. It is located approximately three miles to the south of Sulphur (Ref. 8). The elevation at the property is approximately 950 feet above sea level. The surface elevation following Rock Creek dips to approximately 820 feet above sea level as it flows out of Murray County.

Average annual precipitation ranges from about 36 to 42 inches across the county. May and October are the wettest months on average but much of the spring through fall receives sufficient rainfall. One in two winters have at least one inch of snow, with one year in seven having ten or more inches (Ref. 7). The property is within a 100 year flood zone (Ref. 9). According to former commanding officer Don Payne, Rock Creek flooded in the mid 1960's which inundated the armory and adjacent high school football field in approximately five feet of water. An above ground storage tank containing diesel fuel, reportedly located on the northwest side of the Armory had spilled during this flood. Much of the spill was carried away in receding flood waters. No visible residual contamination was observed during the site visit (Ref. 8).

During the site reconnaissance, a representative from the Oklahoma National Guard and Commanding Officer of the Sulphur Armory from 1967-70, Mr. Darryl Payne, indicated military vehicle washing occurred in the motor pool bay from its construction in the late 1930's to the early 1990's when the military ordered this activity to be discontinued and the floor drain plugged (Ref. 8).

During times of flooding, a sump pump in the basement IFR was attached to a piping system and pumped the excess water into the nearby creek. According to National Guard representatives which served at the Sulphur Armory this type of flooding occurred rarely. The sump appeared to be dry during the site visit (Ref. 8).

No indication of remaining spills or surface contamination such as staining or stressed vegetation was observed during the site visit. Based on visual observation of the Site, there are no surface water issues impacted by or affecting the Site (Ref 8).

#### Utilities

Utility information was obtained from the Oklahoma Corporation Commission Utility Directory. Natural gas is supplied by Oklahoma Natural Gas (ONG) and electricity is supplied by Oklahoma Gas and Electric. Telephone service is supplied by Chickasaw Telephone (Ref. 10). The City supplies the water and sanitary sewer for the property (Ref. 8).

#### Underground features

A 1,000-gallon underground storage tank (UST), used to store gasoline, was removed under Oklahoma Corporation Commission jurisdiction in 1983. Soil samples collected in the excavation did not indicate any gasoline leaks had occurred. No evidence of oil or gas exploration or production was observed during the site visit. No oil or gas leases associated with the property were found during the property record search. The floor drain and sump in the vehicle wash bay was plugged in the 1990's to prevent possible discharge of contaminants to the sanitary sewer. The IFR has a sump which discharges via piping to the creek east of the facility. The piping is currently not connected. Wastewater from the Armory is directed to the City sanitary sewer system. According to former Oklahoma National Guard representatives interviewed, no septic tanks or cisterns were used at this property. No evidence of septic tanks or cisterns were observed during the site visit (Ref. 8).

#### Structures

The Sulphur Armory building was built in 1936 and is constructed of concrete, stone, and steel. The facility is in good condition and currently vacant. No other structures are present on the property.

#### Aboveground Storage Tanks (ASTs)

No ASTs were observed during the site visit. Interviews with City and National Guard representatives during the site visit indicate an AST containing diesel fuel was located near the northwest corner of the building until it was removed after a 1960's flood event. The AST spilled its contents during this flood event. National guard representatives said the fuel receded with the floodwaters and left a residue on the armory walls which was later cleaned by military staff. Materials used to clean the residual material were disposed appropriately off site. No evidence of staining or distressed vegetation was observed during the reconnaissance. Based on visual observation, it is unlikely residual fuel from this spill affects the property (Ref. 8).

#### Landfills, Dumping, Disturbed Soil

There are no landfills, dumping, or disturbed soil at the subject property or adjoining properties (Ref. 7). The City of Sulphur currently uses the Southern Oklahoma Regional Disposal Landfill, Ardmore, Oklahoma, which is the nearest landfill to the facility, approximately 30 miles south of Sulphur (Ref. 11).

#### Impoundments

There are no impoundments on the facility property. Surface water from rock creek has caused significant flooding in Sulphur in the 1960's. Today flood control systems are in place to mitigate flood events from impacting the City (Ref. 8).

#### Air Emissions, Wastewater Discharge

Lead dust from the IFR may have been exhausted through the roof vent during its operations. According to a representative from the National Guard, the IFR ceased operations in the mid 1960's. Lead dust was found to have migrated from the IFR into an adjacent room. Lead contamination from the IFR may be present in the IFR sump and have been discharged to the creek. The facility's wastewater is discharged to the City sanitary sewer system. Because ACM may have been used in the facility, there is a potential for asbestos to be present. No wastewater discharge or air emissions from adjacent facilities affect the property (Ref. 8). An asbestos and lead survey should be conducted at the facility to evaluate the potential for migration of contaminants.

#### Industrial Activities

Currently, there are no industrial activities on the subject property. According to a former National Guard member serving at the armory, light vehicle maintenance such as oil and tire changes and vehicle washing occurred until the early 1970's. No other historic industrial activities occurred at this facility. Currently, there are no industrial activities occurring at the facility. There are no industrial activities impacting the property from adjacent properties (Ref. 8).

#### Monitoring Wells

No monitoring wells were present on the property (Ref. 8). The Oklahoma Water Resources Board well record database of recorded wells indicates two wells used for groundwater monitoring within a one mile radius of the site. The wells are located up-gradient of the property based on surface topography. The wells are installed at depths of approximately 20 feet (Ref. 12).

#### Stained Soils

No stained soils were observed on the facility property (Ref.8).

#### Seeps

No seeps were observed on the facility property (Ref.8).

### Chemical Spills

No chemical spills were observed at the facility. The Emergency Response Notification System (ERNS) database does not indicate a recorded spill at the property (Ref. 13).

### Oil and Gas Exploration

No evidence of oil and gas exploration was observed on the facility property.

### Known Groundwater or Surface Water contamination

No up gradient properties are known to have groundwater contamination. Historic activities at the facility do not appear to have affected groundwater. Historic discharge from IFR flooding events to the surface water may have discharged lead contaminated water to the creek. Based on historic information this appears to be an isolated historic event. Continuous creek flow over time is likely to have diluted any impact to the creek. No evidence (such as stressed vegetation, sheen, or stains) of surface water contamination affecting the property or affected by the property was observed during the site visit (Ref. 9).

### Farm Waste

No farm waste was observed during the site visit (Ref. 9).

### Known Pesticide Misapplication

No misapplication was observed during the site visit or known to have occurred at the property (Ref. 9)

### 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. 9).

### Pipelines

No oil or gas production pipelines are located near the property (Ref. 9).

### Transformers/PCB Equipment

No transformers were observed on or adjacent to the property. Fluorescent lighting ballasts used in the armory may contain PCB's. No leaks or stains were observed during the site visit. There is no evidence to indicate that PCB's environmentally impact the property.

### Other known or Suspected Environmental Concerns On the Site

The indoor firing range dust residue is contaminated by lead. Sand from the IFR sand trap was removed from the IFR by the National Guard. The disposition of the sand is unknown. Past sampling has been conducted to characterize the lead concentration of this room. 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.

14). Two samples were collected outside the firing range room (IFR) and the following are the locations and concentrations of lead found outside the IFR.

- 246.85 ug/ft<sup>2</sup> of lead was found on the drill floor outside the IFR
- 907.75 ug/ft<sup>2</sup> of lead was found on the window sill immediately outside the IFR.

A copy of the Sulphur Armory section of the Indoor Firing Range Lead Issues Report can be found in Appendix F.

The sump located in the IFR may also have associated lead contamination. The sump pump which has been removed discharged vertically through piping which exits through an opening near the IFR window. There is no evidence there was ever any discharge to the sanitary sewer (Ref. 8).

Lead based paint on windows and walls of the facility may be of environmental concern. Lead paint purchased prior to 1978 may have been used at the facility. Paint chips from cracked or peeling paint may have caused elevated lead concentrations in soils beneath the windows (Ref. 8).

Asbestos containing materials (ACMs) purchased prior to 1978 including floor tiles, roofing products, insulation in the space heaters and wrapping around the elbow connections may have been used in the facility. Suspect ACM floor tiles were observed in the armory during the site visit (Ref. 8).

PCB containing equipment purchased prior to 1978 may have been used in electrical equipment such as lighting ballasts and capacitors. Damaged PCB containing equipment may be a hazard to occupants. The electrical equipment in the armory appears to be in good condition. No leaks or stains were observed during the site visit. Evidence indicated that PCB contamination does not affect the property (Ref. 8).

Mercury containing switches, thermostats and other building process equipment may be present in the building. Damaged mercury containing equipment may be a hazard to occupants. No damaged equipment was observed during the site visit (Ref. 8).

#### Historical Recognized Environmental Conditions on the Site

The use of lead based paint, mercury, PCBs, and asbestos purchased prior to 1978 may have been used at the facility. There is known lead contamination in the IFR. An AST used by the National Guard was removed from the property after a flood caused it to spill in the 1960's. A 1000 gallon UST used for gasoline has been removed and closed in place by the Oklahoma Corporation Commission (Appendix C).

### *3.3 Operational History*

The Sulphur Armory was built in 1936 and was managed and maintained by the Oklahoma Military Department to support the military mission of the Oklahoma Army National Guard (OKARNG). The Sulphur Armory served as a training facility, stored military training materials, military transportation equipment, and provided maintenance. The OKARNG is a component of the United States Army and fulfills the military mission of national security (Ref. 15).

### *3.4 Current Use of the Property*

The Armory is currently vacant. The facility grounds are maintained by the Sulphur School District (Ref. 9).

### *3.5 Adjacent Properties*

The property is bordered to the north and by residential property and Rock Creek. To the east is a transformer station and residential property. The south and west side's border Sulphur school district properties (Ref. 9).

### *3.6 Site Inspection*

Site reconnaissance was performed on October 10, 2007 by DEQ representative, Jarrett Keck. The site visit is 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 October 10, 2007. The land originally was owned by the Chickasaw/Choctaw Tribe. In 1911 the land was deeded to a private individual. The City of Sulphur acquired the land in 1936. In 1965, the City of Sulphur sold the land to the National Guard. The Oklahoma National Guard owned the property until 2007 when the title was transferred to the Oklahoma Department of Environmental Quality (DEQ). The DEQ is holding the title in order to expedite the environmental investigation and cleanup, after which the title will be transferred to the Sulphur Public School System (Ref. 8).

### *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. 8).



#### *4.3 Specialized Knowledge or Experience of User*

Individuals representing the City of Sulphur have no specialized information, knowledge, or experience related to environmental concerns at the property (Ref 9).

#### *4.4 Actual Knowledge of User*

The Sulphur 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. 15).

After the National Guard vacated the armor, it was briefly occupied by the Chickasaw Nation for use as a childcare facility until it was determined elevated lead dust concentrations present in the building were potentially unsafe. The building is currently vacant. Lawn maintenance activities are conducted by the Sulphur School District (Ref 9).

#### *4.5 Commonly Known or Reasonably Ascertainable Information*

The armory was briefly occupied by the Chickasaw Nation for use as a childcare facility until it was determined elevated lead dust concentrations present in the building were potentially unsafe. An AST was removed from the property following a spill resulting from a flood in the 1960's. A UST was removed from the property in 1993. The building is currently vacant. Lawn maintenance activities are conducted by the Sulphur School District (Ref 9). Remedial activities will have to be performed before the title of the property will be transferred.

#### *4.6 Valuation Reduction for Environmental Issues*

The transfer of ownership bears no relation to environmental concerns at the property. The goal of transferring title to the City is the beneficial use of the currently vacant facility. Remedial activities will have to be performed before the title of the property will be transferred.

#### *4.7 Owner, Property Manager, and Occupant Information*

The subject property is owned by the Oklahoma Department of Environmental Quality. The armory is currently vacant. Lawn maintenance activities are conducted by the Sulphur School District.

#### *4.8 Reason for Performing Phase I*

The DEQ performed this Phase I Targeted Brownfield Assessment (TBA) to analyze if there are any recognized environmental conditions that need to be addressed prior to

transfer of ownership and to provide the City the prior purchase requirement of the Bona Fide Prospective Purchaser Protection from Superfund. The City of Sulphur would like to acquire the Sulphur Armory property for future City operations. Before this can occur, a Phase I TBA must be conducted along with any remedial actions necessary for occupancy 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. 16).

#### Federal Delisted NPL site list within one-half mile

The property is not a delisted NPL site. There are no delisted NPL sites within one-half mile (Ref. 16).

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

The property is not listed on CERCLIS. There are no CERCLIS sites reported within a 0.50-mile radius of the subject property (Ref. 17).

#### 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 (Ref. 17).

#### Federal RCRA CORRACTS Facilities List within one mile

The property does not have any federal RCRA CORRACTS facilities within a one mile radius (Ref. 18).

#### RCRA non-CORRACTS TSD Facilities List within one-half mile

The property does not have any RCRA non-CORRACTS TSD facilities within a one-half mile radius (Ref. 19).

#### Federal RCRA Generators List (property and adjoining properties)

The property does not have any listed RCRIS-Large Quantity Generator (LQG) or RCRIS-Small Quantity Generator (SQG) sites. There are no RCRIS LQG or SQG sites reported at the adjoining properties (Ref. 18).

Federal Institutional Control/Engineering control registries (property only)

There are no Institutional Control/Engineering controls on the property (Ref. 9); therefore, it is not listed on a Federal registry.

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

The property is not reported on the ERNS site list (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. 20). The cleanup will be performed to assist the City in acquiring the property.

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

The subject property does not have any permitted state landfills within a one-half mile radius (Ref. 21).

State Leaking Underground Storage Tank (LUST) List within one-half Mile

There are no active LUST sites within one-half mile of the subject site. The UST Notification Database maintained by the Oklahoma Corporation Commission (OCC) has no LUST sites listed within one-half mile of the Sulphur Armory (App C).

State Registered Storage Tank Lists (property and adjoining properties)

There are thirteen facilities within a one-mile radius of the facility that have or have had UST's on their property. One of these USTs is a used oil tank one-half mile north and up gradient of the armory. The tank was closed under Oklahoma Corporation Commission (OCC) jurisdiction. No leaks from this tank were recorded. It does not impact the Armory. The Armory had a 1000 gallon underground storage tank which stored gasoline from 1958 until it was removed 1993. No impact to groundwater or soil was found. The remainder of the tanks are either geographically side-gradient or down gradient from the armory and do not impact the property. Information of these industrial activities was obtained from the site visits and the Oklahoma Corporation Commission UST Notification Database (App. C).

State Institutional Control/Engineering control Registries (property only)

The subject property is not listed in any State Institutional/Engineering Control Registries (Ref. 8).

State Voluntary Cleanup Sites and Brownfield Sites within one-half mile

One Targeted Brownfield Assessment was performed by the Department of Environmental Quality near Highway 177 and Broadway. No evidence of contamination was observed during the investigation. No other State Voluntary Cleanup Sites or Brownfield Sites listed in the DEQ database are within one-half mile of the facility (Ref. 21).

### *5.2 Additional Environmental Record Sources*

According to Sulphur Public Works Director, Keith Woodell, no City permit violations for activities at this property have been issued (Ref. 9).

Tribal records were not available for this property and therefore are not included in this report.

### *5.3 Physical Setting Sources*

Physical Setting sources were obtained from the U.S. Geological Survey, Federal Emergency Management Association, Oklahoma Climatological Survey, the United States Department of Agriculture Soil Conservation Service Soil Survey of Sulphur County, and a site visit conducted on October 10, 2007.

### *5.4 Historical Use Information on the Property*

The Sulphur Armory was built in 1936 and supported the military mission of the Oklahoma Army National Guard (OKARNG) until 2002 when OKARNG vacated the property.

In late 2003, after the National Guard vacated the property, the armory was briefly occupied by the Chickasaw Nation for use as a childcare facility until early 2004 when it was determined that elevated lead dust concentrations were present in the building and it was potentially unsafe. The building is currently vacant. Lawn maintenance activities are conducted by the Sulphur School District (Ref. 9).

### *5.5 Historical Use Information on Adjoining Properties*

#### Aerial Photo Review

Archived aerial photographs of the subject property were reviewed at the Oklahoma Department of Libraries.

The earliest aerial photograph reviewed was taken on January 17, 1940. The armory is clearly seen north of a relatively undeveloped field adjacent to Rock Creek. Small structures are observed in the field and what appears to be a dirt road. The City of Sulphur is developed with residential housing and a commercial district southeast of the property. Development north of the property appears sparse. Further North is agricultural land.

A second photograph, taken in May 19, 1956, shows little change from the previous photograph with the exception of the development of the Sulphur High School football field south of the property and High School building further southwest.

In a 1995 aerial photograph, increased residential properties are seen to the north, particularly around Elks Lodge Lake. The Sulphur School district building is seen immediately west of the armory. The High School track and baseball diamond are clearly seen south of the property.

No significant changes from 1995 can be seen in the 2003 aerial photograph.

These aerial photographs can be found in Appendix C.

#### Zoning/Land Use Records Review

The facility is zoned for public utilities and institutions. Any change in this designated use will require a review and vote by the City of Sulphur.

#### Fire Insurance Maps

The following Sanborn Maps were reviewed (App. C):

November 1906: Block 93 shows a Baptist Church. Two small buildings are located east of the church. Block 94 further east shows "Sulphur Steam Laundry" closest to Rock Creek.

January 1911: The Baptist Church seen in the 1906 map has been changed to a public school. Two small buildings are located east of the school apparently unchanged from 1906. Block 94 shows the steam laundry facility is now a "hay and furniture store."

August 1918: No buildings are seen on block 93. The "hay and furniture store" seen in 1911 block 94 is now the "Sulphur Milling Company."

April 1928: No buildings are seen on block 93. The "Sulphur Milling Company" seen in 1918 block 94 is now designated as "Armory" located east of the current Armory location.

April 1928 – May 1944: Block 93 now shows the "National Guard Armory" in its current location. No buildings are seen in block 94.

#### Property Tax files

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

### City Directories

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

### Building Department Records

According to the Sulphur Public Works Director, Kieth Woodell, There are no zoning or permit violations on the facility (Ref. 9).

### Interviews

Interviews were conducted with various former members of the National Guard unit stations at the Sulphur armory including: Darryl Payne, former Commanding officer, Don Payne, administrative supply technician, D.E. Lannon, first sergeant, as well as Brian Bayan, head of maintenance for the Sulphur School District and Kieth Woodell, Sulphur Public Works Director. Information on the interviews 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 visit at the Sulphur Armory was performed on October 10, 2007 by DEQ representative, Jarrett Keck. The site reconnaissance consisted of a walkthrough inspection of the armory building and grounds. All rooms in the facility were inspected. A windshield survey was conducted of the surrounding properties.

### *6.2 General Site conditions*

The main entrance is on the south side of the building. The armory has a gravel driveway entering west of the main entrance from Wynnewood Street. The driveway leads to a chain link fence and gate which surrounds the north half of the property. No wells were observed on the site. All water comes directly from the City of Sulphur water supply. Drainage at the site is towards the east to Rock Creek. The building is in good condition. Painted surfaces on the interior and exterior are chipping and cracking in places. Some remediation is required prior to the DEQ transferring ownership of the property (Ref. 9).

### *6.3 Exterior observations*

The north perimeter of the property is fenced with a six-foot high chain-link fence. A chain link gate opens from the gravel driveway on the west side of the building. The exterior of the building is in good condition. Paint from exterior painted surfaces is chipping and peeling. Roof drains are located on the west and north sides of the building. An electric meter box is located on the northeast corner. No transformers are present on the property. A central air conditioning unit serving the offices and classrooms on the south side of the building is located adjacent to the east exterior wall. The IFR sump

discharge pipe seen extruding from the northeast corner wall is not connected to any pump and is not capped (Ref. 9).

#### *6.4 Interior observations*

Minor oil stains were observed in the vehicle wash bay in the southwest side of the building. The offices east of this room contain a drop ceiling. Remnants of a second drop ceiling can be seen above this ceiling when the panels are removed. Fluorescent lighting ballasts were observed in the office areas and may contain PBCs. No leaks or staining was observed to indicate a leak. Floor tile in the offices and rooms adjacent to the main hallway appear to be 12"x 12" and in good condition. Paint on the exterior windows is cracked and peeling in places. Floor tile in the drill floor area has been removed. According to the Oklahoma National Guard Limited Baseline Assessment (June 2004), the tile was removed after it was determined not to contain asbestos. The original room heating systems are still present throughout the building and may contain asbestos insulation. The kitchen is located in the northeast part of the building. The equipment appears to be in good condition. The hallway leading south from the kitchen leads to an office room. Floor tile in this room is in poor condition. The tile is 9x9 and friable in places. Stairs leading to the basement IFR entrance is located near the kitchen entrance on the northeast side of the building. The stairs are enclosed by a wire mesh cage which was open during the reconnaissance. The IFR is empty with the exception of debris and minor trash. A sump is located near the center of the IFR floor. No pump or water was seen in the sump. A pipe affixed to the east wall near the sump was used to pump water out of the IFR during times of flooding. The pipe discharged water to the nearby creek east of the facility. An IFR vent and fan are located on the wall close to the ceiling and discharge pipe. At the south wall of the IFR is the wooden frame of a former target backstop. Old targets, dust, and debris are on the floor within the frame. The sand trap was removed sometime in the late 60's. The disposition of the sand is unknown. A target room west of the target backstop is empty (Ref. 9). Lead contaminated dust and friable asbestos will require remediation.

#### *7.0 Interviews*

##### *7.1 Interviews with Past and Present Owners of the property*

Interviews were conducted with various former members of the National Guard unit stations at the Sulphur armory including: Darryl Payne, former Commanding officer, Don Payne, administrative supply technician, and D.E. Lannon, first sergeant. These individuals stated the function of the unit was primarily to store and maintain military transportation vehicles. Minor maintenance activities occurred at the facility until the early 1970's. The property flooded in the 1960's and caused an AST to spill diesel fuel in the receding floodwaters. Minor residue remaining was cleaned and properly disposed. The AST was subsequently removed from the property. The IFR was used through the late 1960's when target practice activities were moved outdoors at nearby army facilities. The Guard representatives also added that an environmental audit in the

1990's by the military required the gasoline UST to be removed and a floor drain in the in the vehicle service bay to be plugged and was subsequently completed (Ref. 9).

The DEQ, present owner of the property, has had several conversations regarding environmental and safety issues at the armories, with various current employees of the military department. Major Merkle, Colonel 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 Oklahoma Military Department (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.

Interviews with City officials are discussed in section 7.3

#### *7.2 Interviews with Key Site Manager*

The Oklahoma Department of Environmental Quality (DEQ) is the current site manager of the facility (See section 7.1). Lawn maintenance is conducted by the Sulphur School District.

#### *7.3 Interviews with Operators and Occupants of the property*

The DEQ is the current owner/operator of the facility. The facility is currently vacant. See section 7.1.

#### *7.4 Interviews with State and/or Local Government Officials*

The Sulphur Public Works Director, Kieth Woodell, stated that there are no permit violations on the property. He added the property is zoned for public facilities and institution (Ref. 9). Any change to this use would require a review and vote by the City. See section 7.1

#### *7.5 Interviews with Others*

No other individuals were interviewed during this investigation.

## **8.0 Findings**

This Phase I Targeted Brownfield Assessment of the Sulphur 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 October 6, 2007.

The site is located in lots one and six, block 93, City of Sulphur, Murray County, Oklahoma. The street address 500 West Wynnewood in Sulphur, Oklahoma. The main entrance is located at latitude 34° 30' 36.38", longitude -96° 58' 21.82



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.

- An indoor firing range (IFR) and associated dust residue is assumed to have lead contamination based on past sampling of the IFR indicating elevated lead concentrations are present in the building. Lead dust may also have contaminated adjacent rooms and vents. This is a recognized environmental condition.
- Mercury may be present in thermostats, lighting, and other equipment in the facility. Mercury containing equipment can be used safely when it is in good working order. The equipment in the armory appeared to be in good condition during the site visit.
- The original paint on in the armory remains in most areas of the building and has begun chipping in some areas. Due to the timeframe the building was constructed, lead based paint may have been used.
- Soils below exterior painted surfaces may have been contaminated with lead based paint chips.
- Due to the age of the building and period of operation, asbestos containing materials (ACM) purchased prior to 1978 may be present in the facility. ACM is typically used in heating equipment, insulation, ceiling tiles, roofing materials, and flooring.
- Polychlorinated Biphenyls (PCBS) may be present in electric equipment such as ballasts, transformers, and capacitors purchased prior to 1978. PCB containing equipment can be used safely when it is in good working order. The equipment in the armory appeared to be in good condition during the site visit.
- One 1,000-gallon underground storage tank (UST) formerly used to contain gasoline was removed from the southwest corner of the property in 1993. After soil samples confirmed the UST had no impact to adjacent soils, the case was closed under Oklahoma Corporation Commission (OCC) jurisdiction.

## **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 consist of the following:

- The indoor firing range (IFR), IFR floor drain, vent, and adjacent interior areas need additional evaluation and remediation of the lead contamination

- Asbestos containing materials (ACM) may have been used during the construction and remodeling of the facility. The heating equipment, insulation, surfacing materials and flooring should be evaluated for asbestos. Asbestos is only hazardous when it is friable.
- The presence and condition of mercury containing devices and Polychlorinated Biphenyl containing electrical equipment should be evaluated.
- 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 phase of the 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 a transfer of ownership can take place. The information provided in this assessment is to assist the City of Sulphur 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 during this Phase I Targeted Brownfield Assessment other than the analytical results of the IFR and floor tile 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 Cty with removal of the environmental contaminants and ensure that the property is ready for redevelopment.

### ***13.0 Deviations***

No 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 # RP976412010)*. 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 (1967). *Soil Survey of Murray County, Oklahoma. March 1967*. U.S. Government Printing Office: Washington, D.C.
6. U.S. Geological Survey. *Reconnaissance of the Water Resources of the Lawton Quadrangle, Central Oklahoma*, Hydrological Atlas 6 (1977). The University of Oklahoma, Norman, OK.
7. Oklahoma Climatological Survey.  
[http://climate.ocs.ou.edu/county\\_climate/Products/County\\_Climatologies/county\\_climate\\_murray.pdf](http://climate.ocs.ou.edu/county_climate/Products/County_Climatologies/county_climate_murray.pdf)
8. Jarrett Keck (2007). *Field Notes for Site Reconnaissance of the Sulphur Armory (Armory) , October 10, 2007*.
9. Federal Emergency Management Association (FEMA). <https://msc.fema.gov>.
10. Oklahoma Corporation Commission (OCC) list of Regulated Utilities.  
<http://www.occ.state.ok.us/Divisions/PUD/RegUtilities/REGCOMPS.HTM>
11. State Landfill site list: <http://www.deq.state.ok.us/LpDnew/swindex.html>.
12. Oklahoma Water Resources Board. <http://www.owrb.state.ok.us/wd/search/search.php>.
13. Emergency Response Notification System: <http://www.nrc.uscg.mil/foia.html>.
14. Oklahoma Army National Guard. *Indoor Firing Range Lead Issues Report*. C.H. Guernsey & Company. (2005).

15. Oklahoma Military Department Environmental Office (OKDE-ENV). Limited Environmental Baseline Assessment, Sulphur Armory. January 8, 2007.
16. EPA NPL list: <http://www.epa.gov/superfund/sites/npl/ok.htm>.
17. CERCLIS current and archived sites: <http://cfpub.epa.gov/supercpad/cursites/srchsites.cfm>.
18. RCRA database: [http://www.epa.gov/enviro/html/rcris/rcris\\_query\\_java.html](http://www.epa.gov/enviro/html/rcris/rcris_query_java.html).
19. RCRA NOTIFIERS sorted by county and then city:  
<http://www.deq.state.ok.us/LPDnew/HW/Notifiers/notifiersbycountycity.pdf>.
20. State Hazardous Waste Sites: <http://www.deq.state.ok.us/LPDnew/hwindex.html>.
21. DEQ Dataviewer: <http://maps.scigis.com/deq%5Fwq/>.

### ***15.0 Signature(s) of Environmental Professional(s)***

See page two for signatures of environmental professionals.

### ***16.0 Environmental Professional(s) Statement***

See page two for Environmental Professional(s) Statement.

### ***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 – Indoor Firing Range Lead Issues Report – Sulphur Armory

## Appendix A - Site (Vicinity) Map

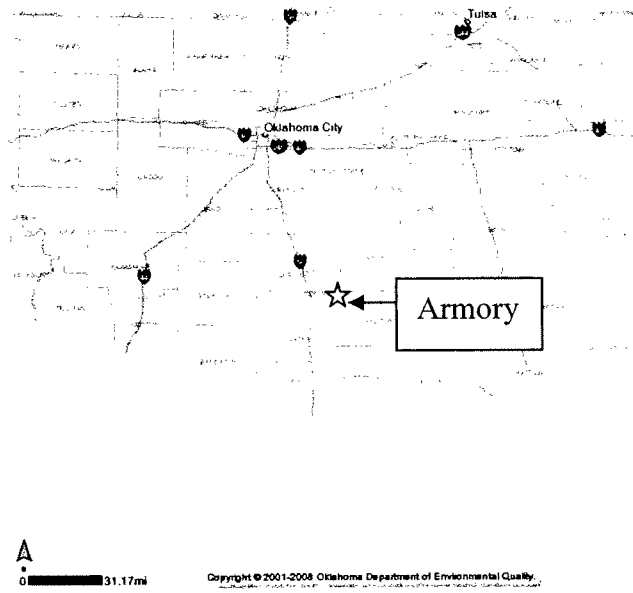
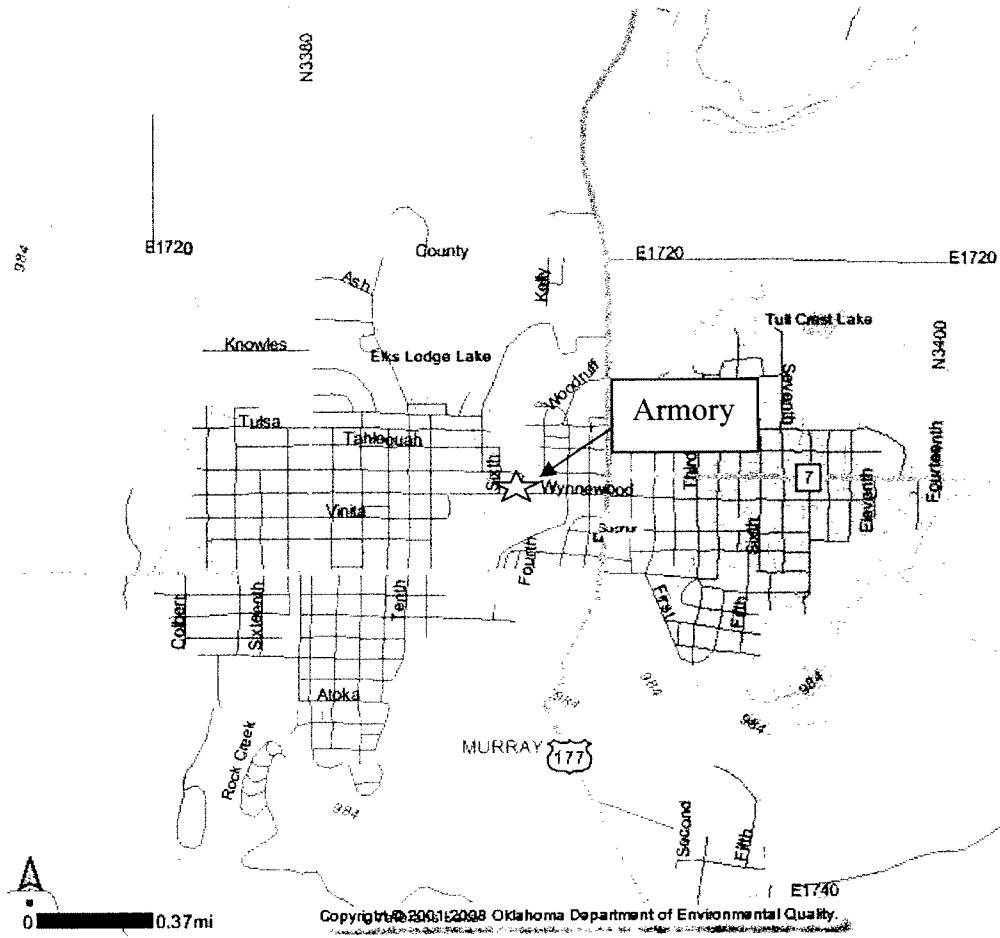


Figure 1. Site Vicinity Map

## Appendix B - Site Photographs



Figure 1. Plaque stating Armory dedication in 1936.

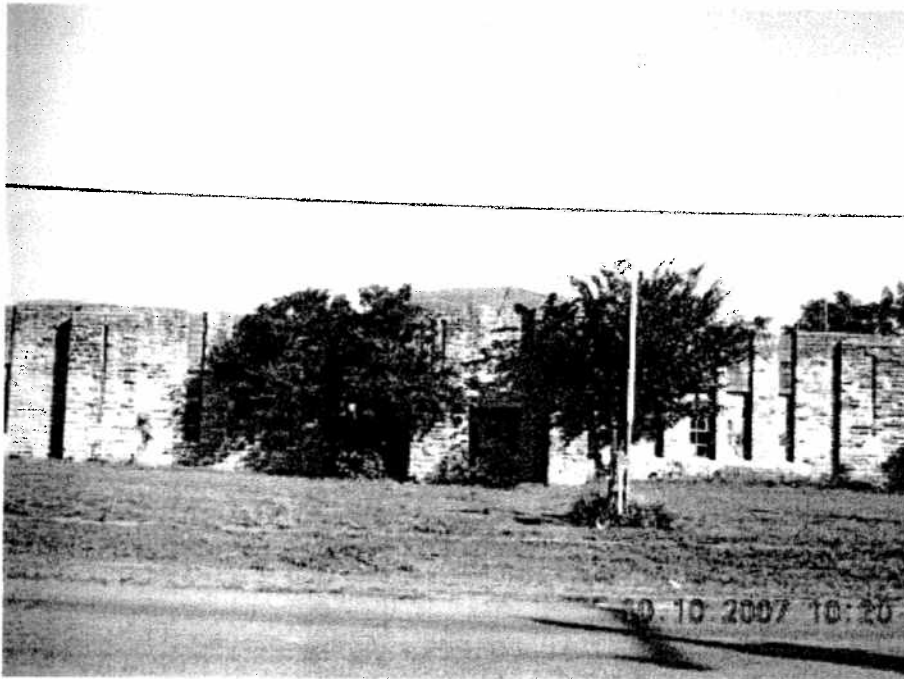


Figure 2. Front of armory looking north.



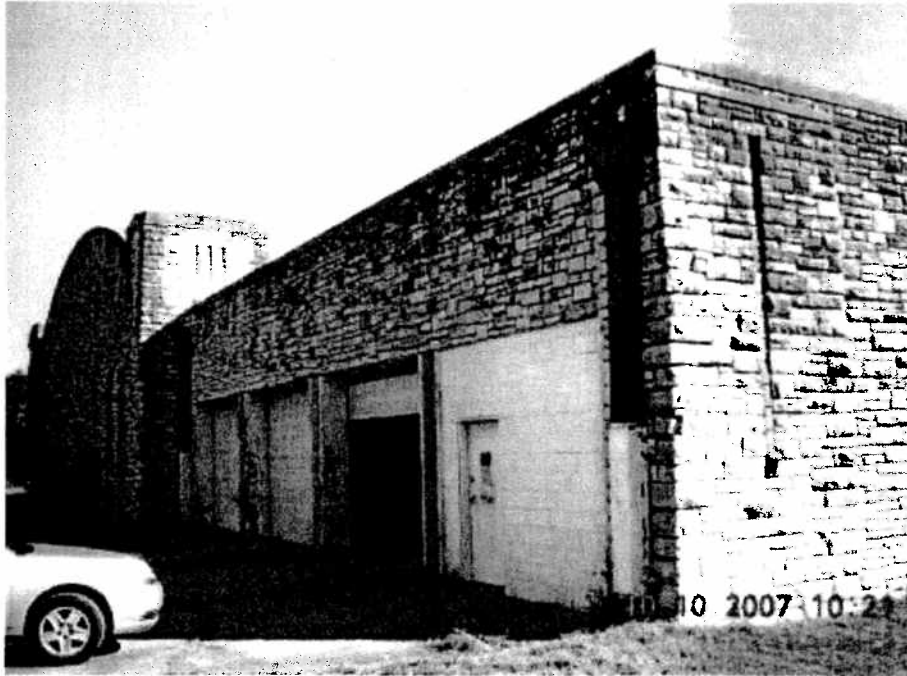


Figure 3. Southwest corner of armory looking northeast.

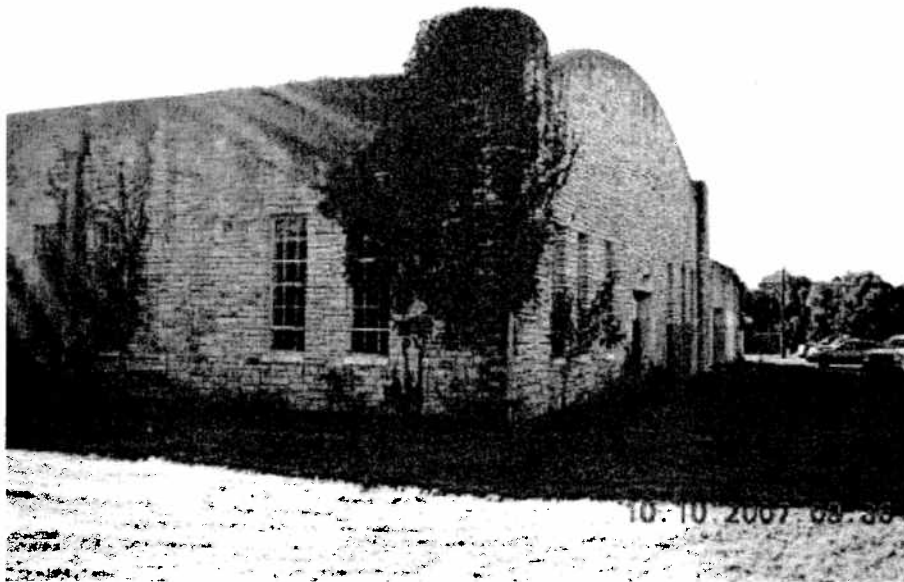


Figure 4. Northwest corner looking southeast.



Figure 5. Electric meter box on northeast corner of armory.

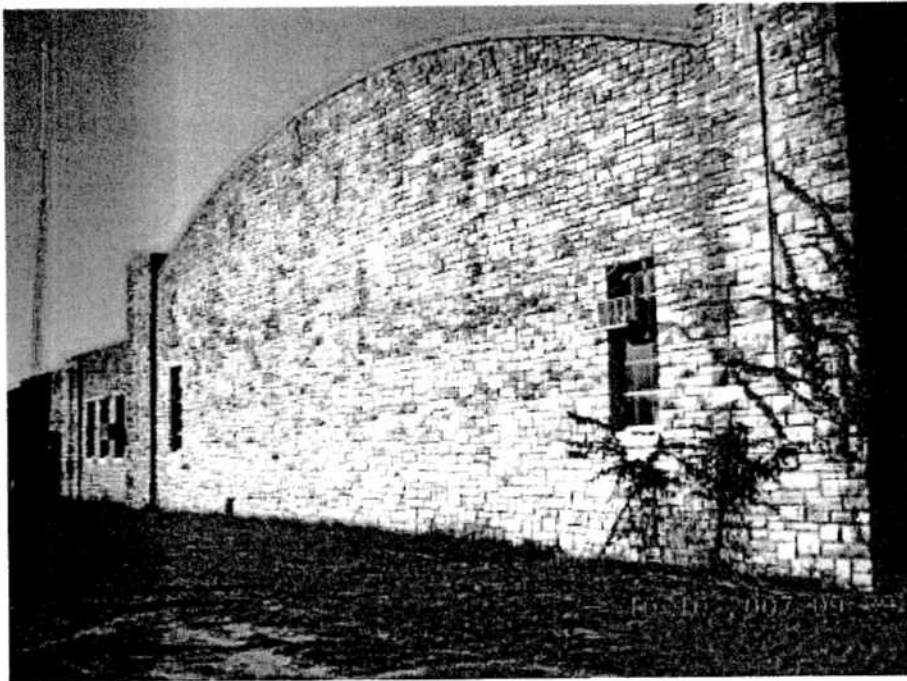


Figure 6. East side of the armory facing southwest.



Figure 7. Central air-conditioner for offices in south part of the armory. Located near the southeast corner of the armory.



Figure 8. Minor rust stain from water faucet located on the south wall of the vehicle service bay in the southwest corner of the building.

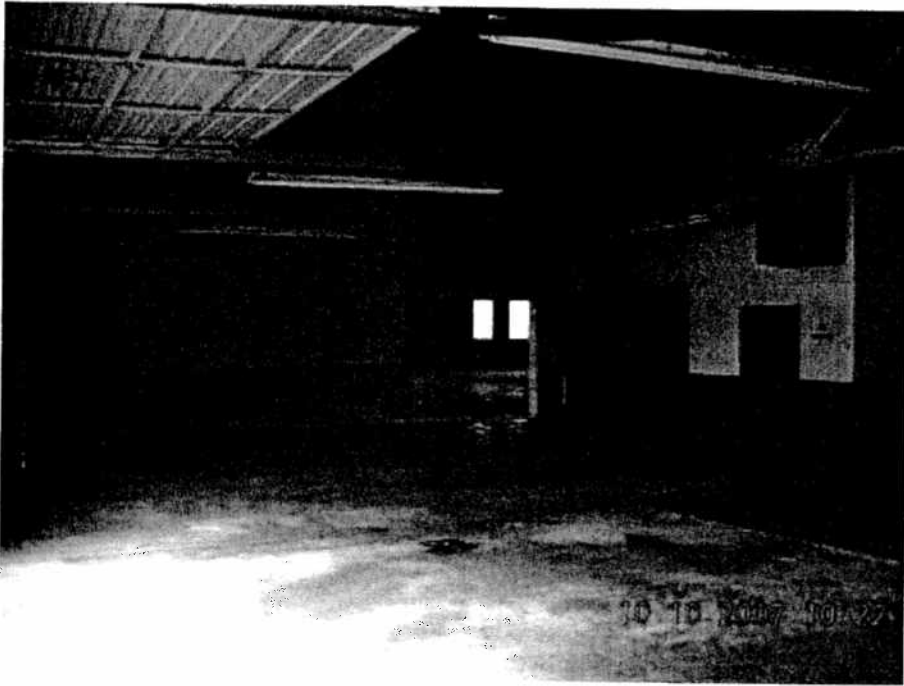


Figure 9. View from the vehicle service bay in the southwest corner of the armory looking northeast. Note minor oil stain on the floor (bottom center).

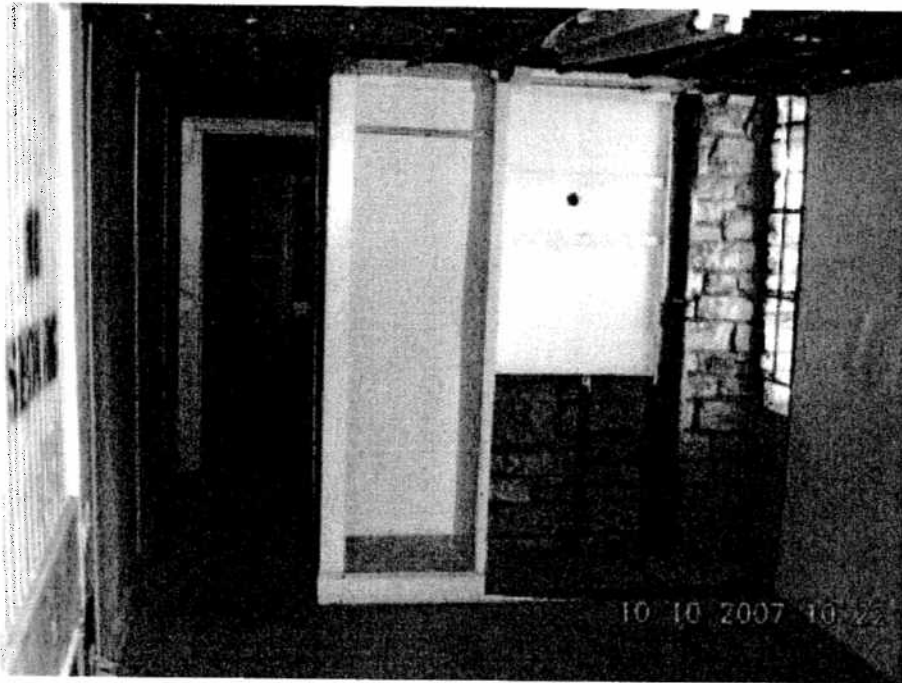


Figure 10. Hallway on the Southside of the building looking from the vehicle service bay leading the central hallway and offices.



Figure 11. A second set of original ceiling tiles above a lower set of ceiling tiles in the hallway seen in figure 10.



Figure 12. Twelve inch floor tiles in an office located in the south part of the building near the main entrance.

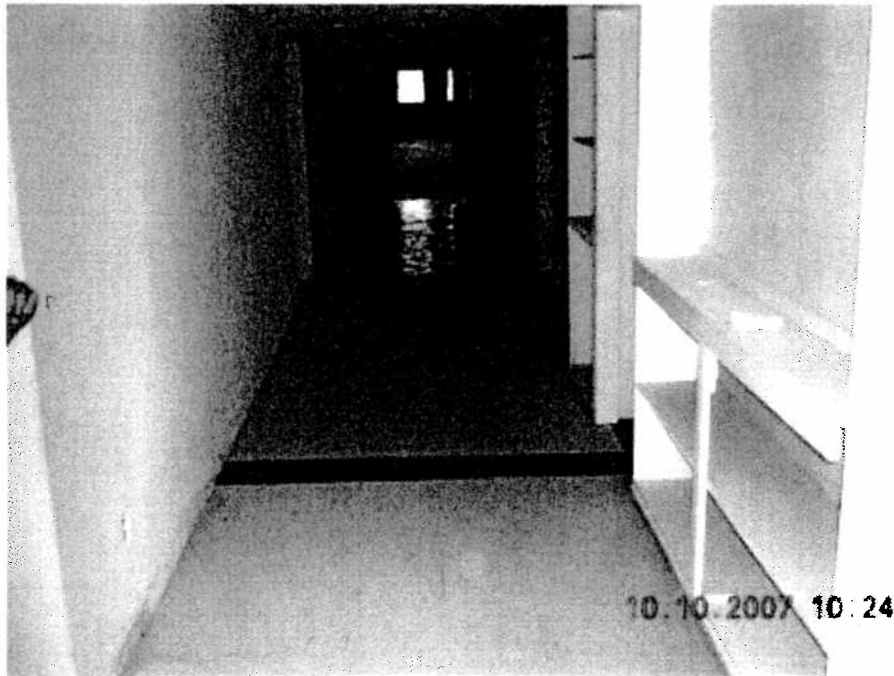


Figure 13. View from the main entrance looking north thru the hallway to the drill floor in the background.

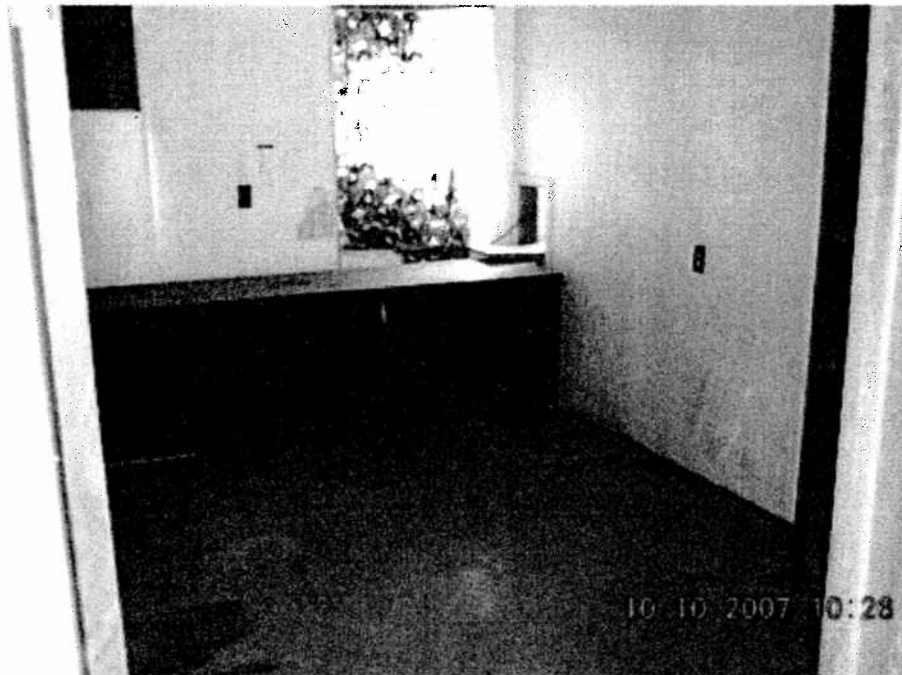


Figure 14. Office space off the main hallway located in the southeast side of the building.



Figure 15. Small gas floor heater typical of heating units found in the office spaces.

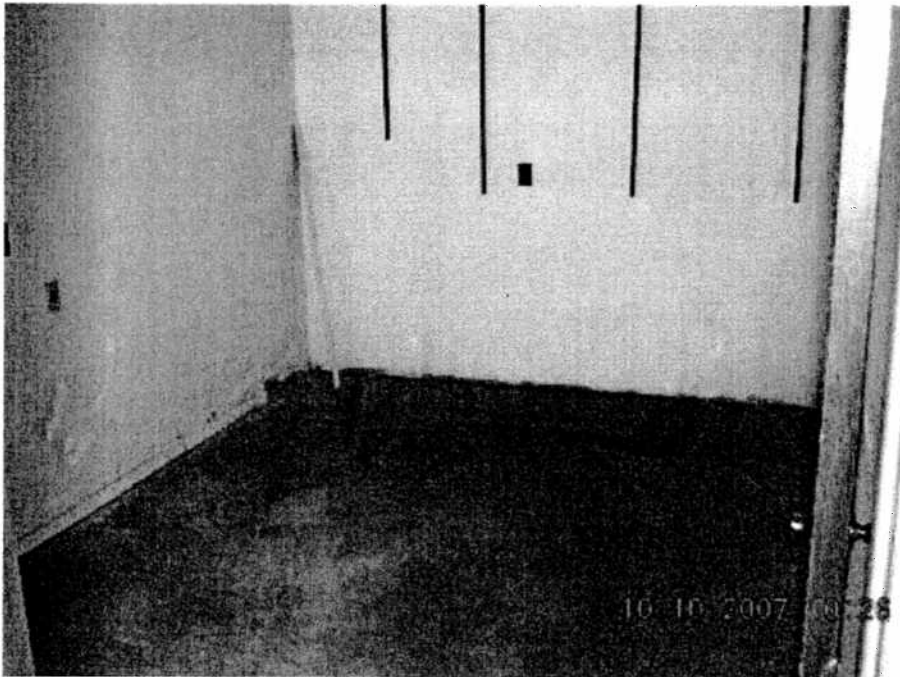


Figure 16. Storage area located off the main hallway in the south side of the building.

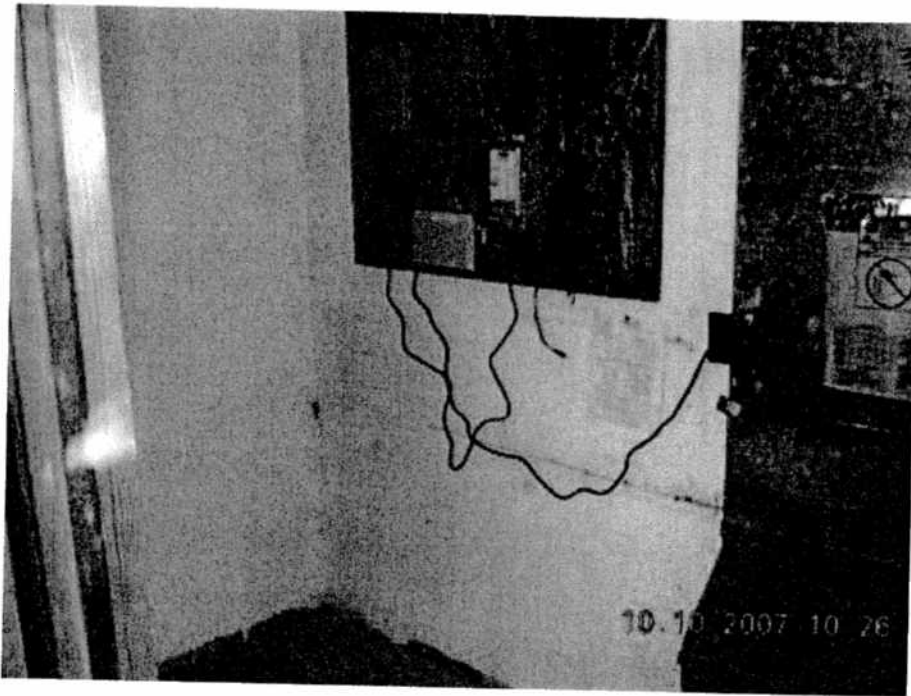


Figure 17. The utility closet off of the main hallway with air conditioning plenum.

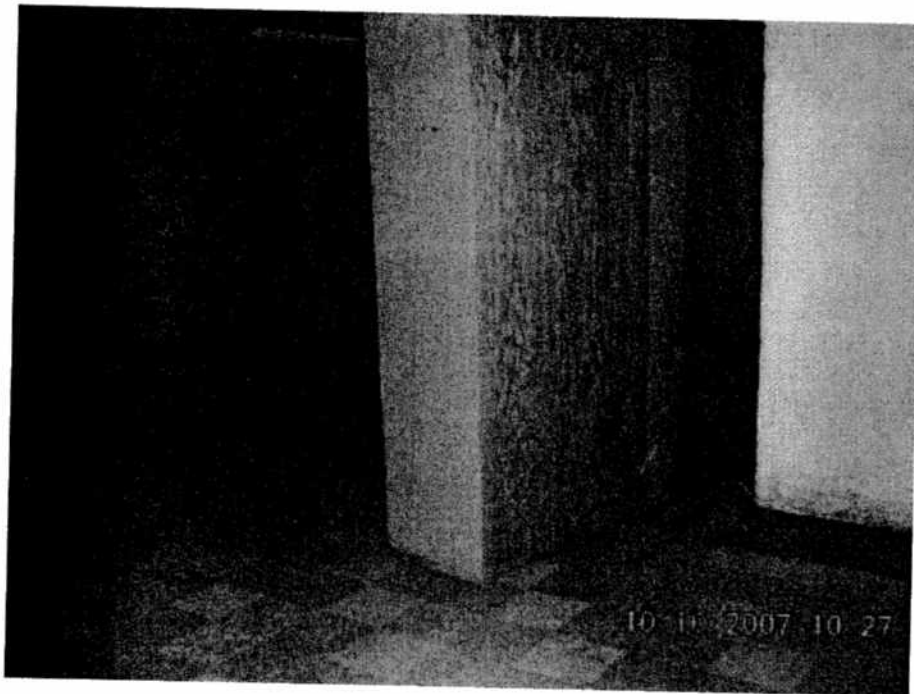


Figure 18. Room located off the main hallway on the west side. Tiles shown are 12”.



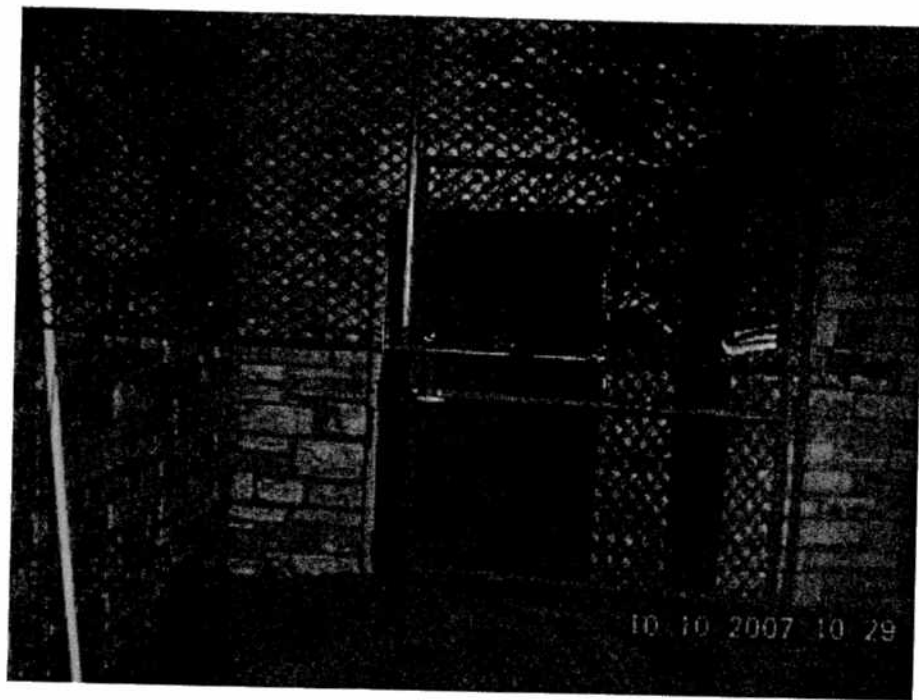


Figure 19. Unlocked caged area located in the room noted in figure 18.

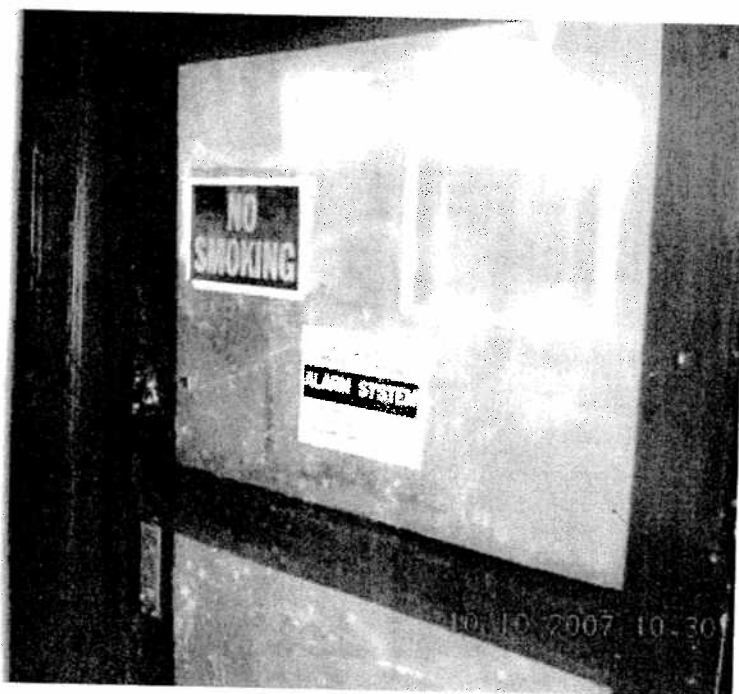


Figure 20. Fire door entrance to the "Commo" room west of the main hallway.

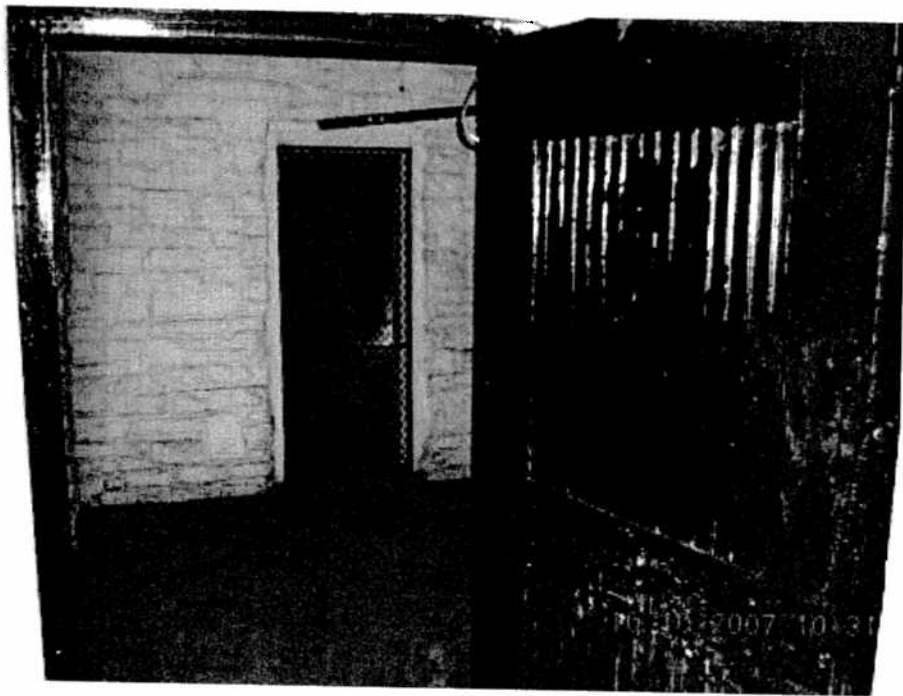


Figure 21. Room north of the “commo” room.

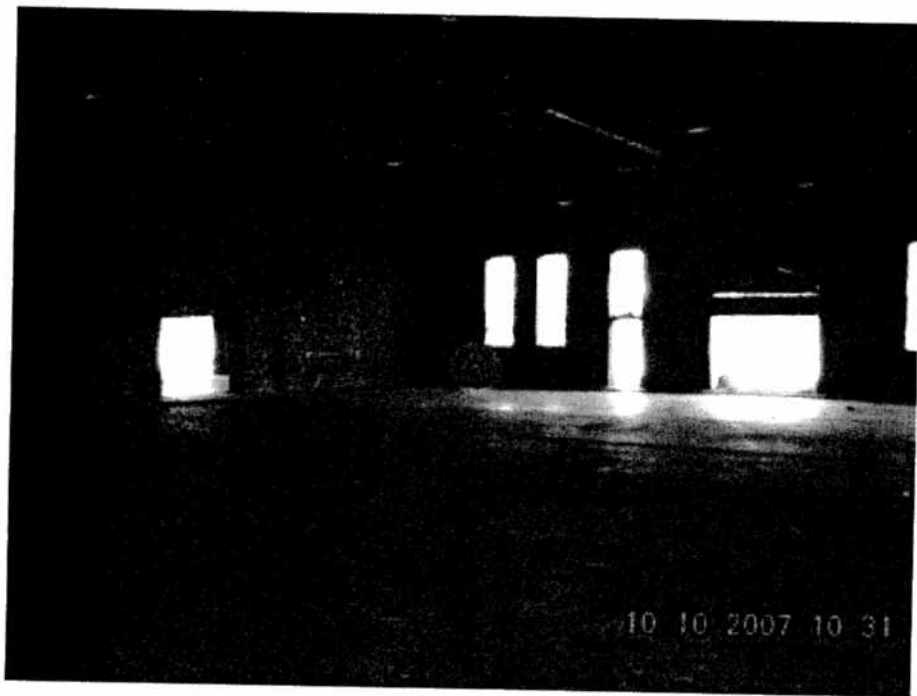


Figure 22. Drill floor looking west.



Figure 23. Drill floor ceiling looking west.

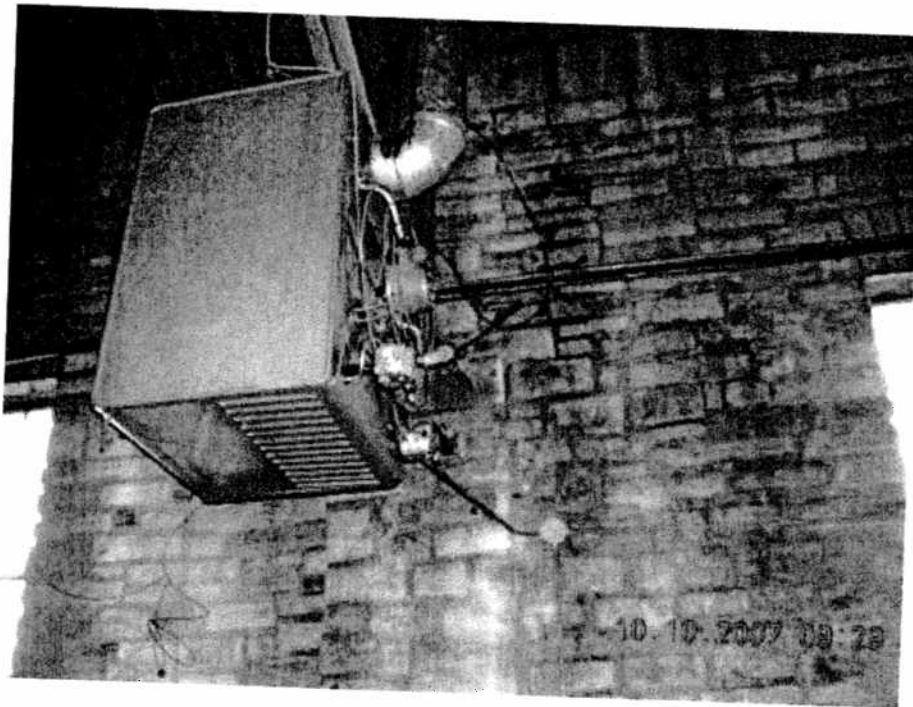


Figure 24. Drill floor heating system.



Figure 25. Drill floor view noting the floor tile is completely removed.

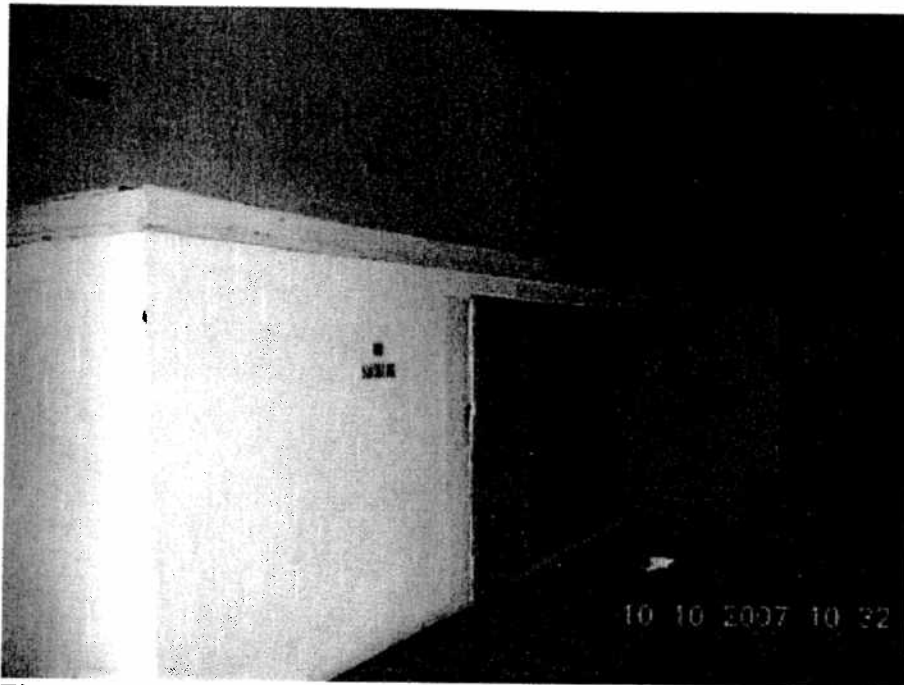


Figure 26. Storage area on the east wall of the drill floor.

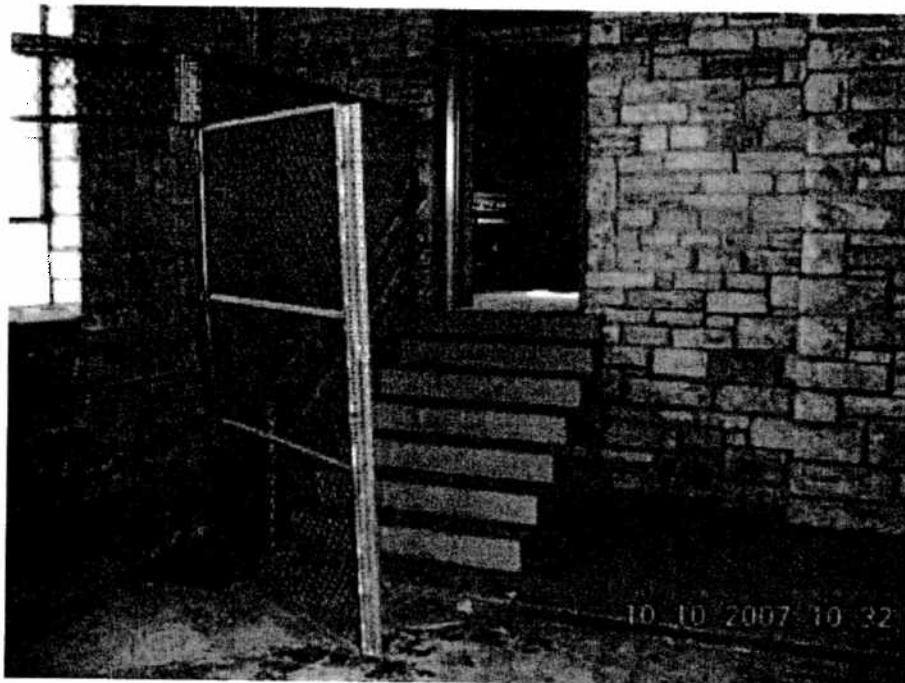


Figure 27. Yellow stairs leading to the kitchen on the northeast side of the drill floor. Note caged stairwell leading to the basement IFR to the left.

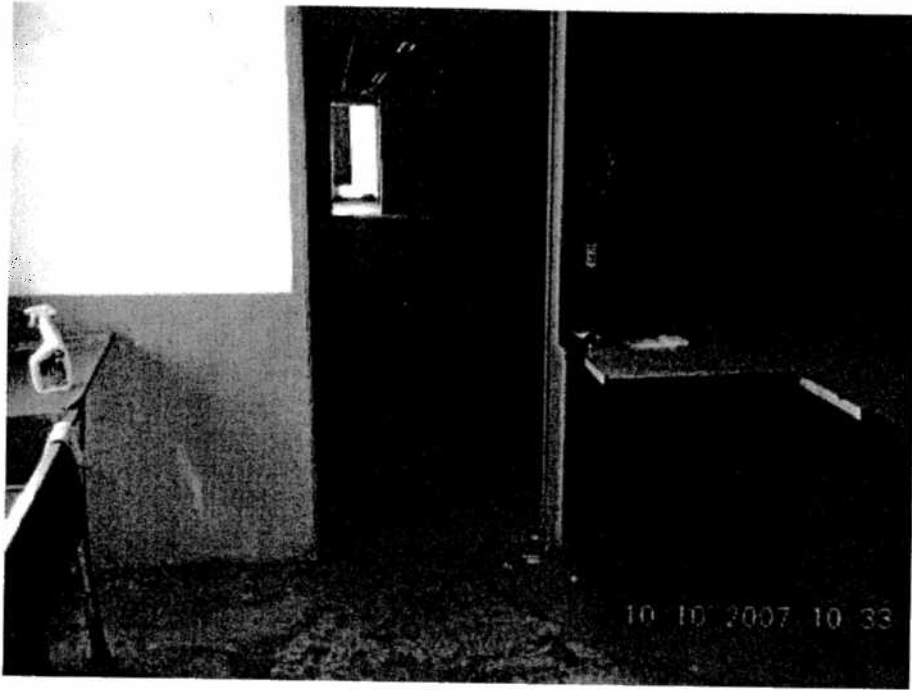


Figure 28. View from the kitchen viewing to the south.



Figure 29. Window looking east from the office south of the kitchen area. Note the cracking and peeling paint typical of most of the Sulphur Armory windows.

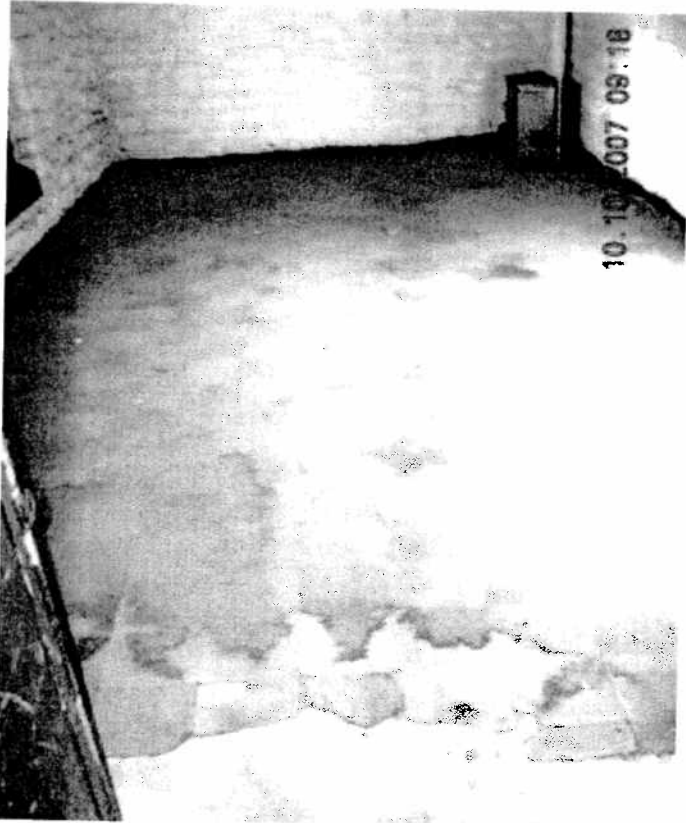


Figure 30. Office south of the kitchen and east of the drill floor. Note 9-inch floor tiles.



Figure 31. Close-up of the floor tiles seen in figure 29. The 9 inch tiles are chipping and crumbling and likely contain asbestos.

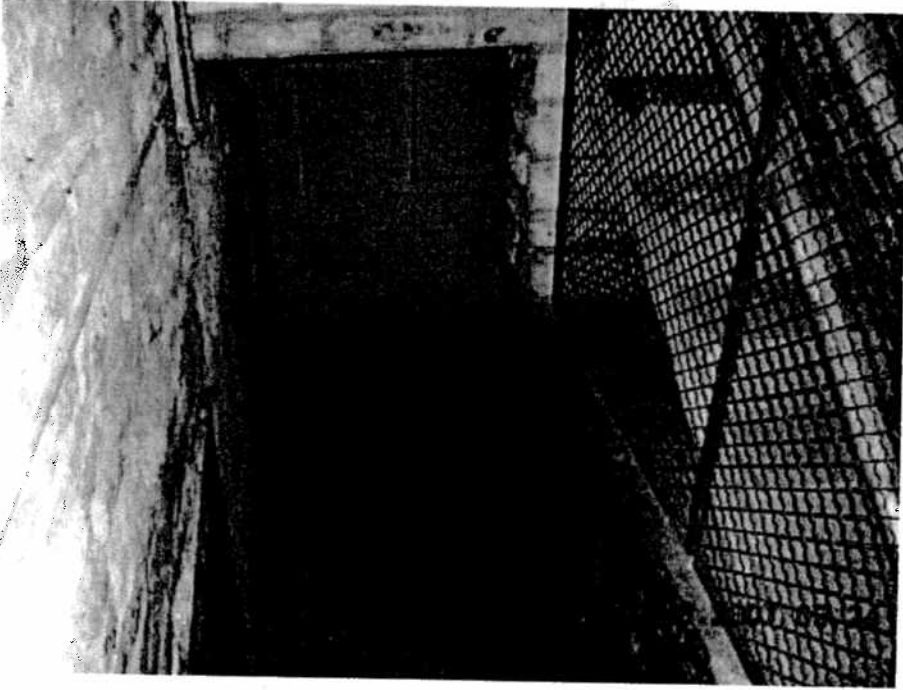


Figure 32. View from top of the stairwell into the basement IFR. The IFR entrance is located on the northeast side of the drill floor.



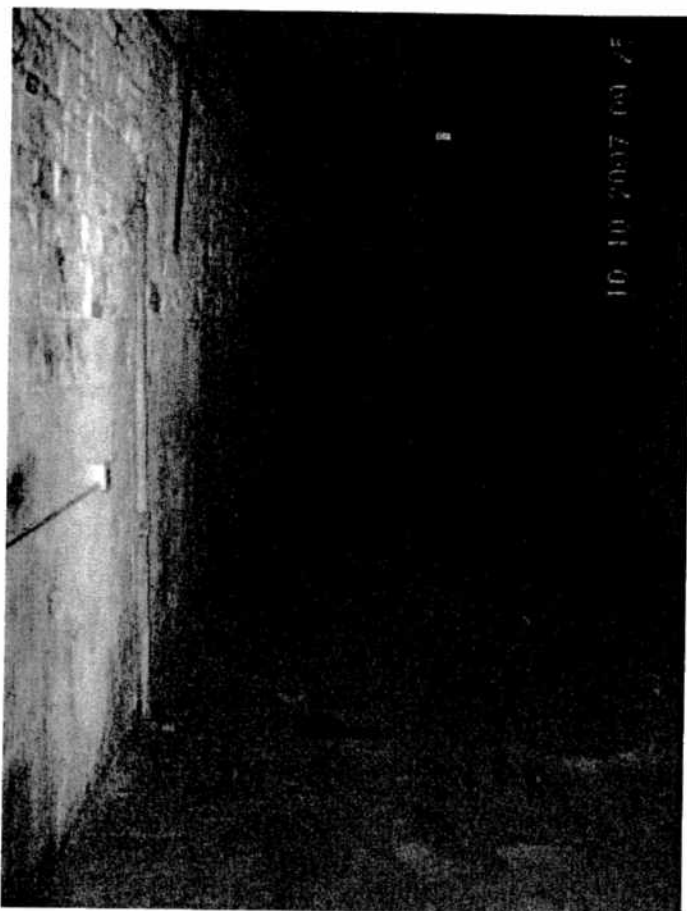


Figure 33. View of the basement IFR from the north end looking south. Note floor sump and discharge pipe on the wall.

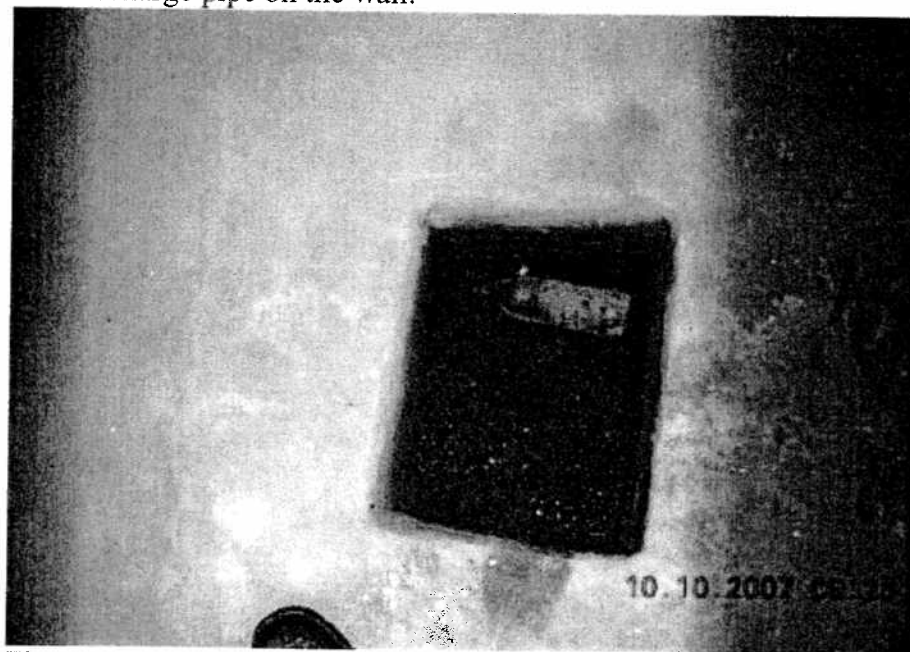


Figure 34. Close-up of the IFR sump.



Figure 35. View of the sump discharge pipe mounted to the north IFR wall.

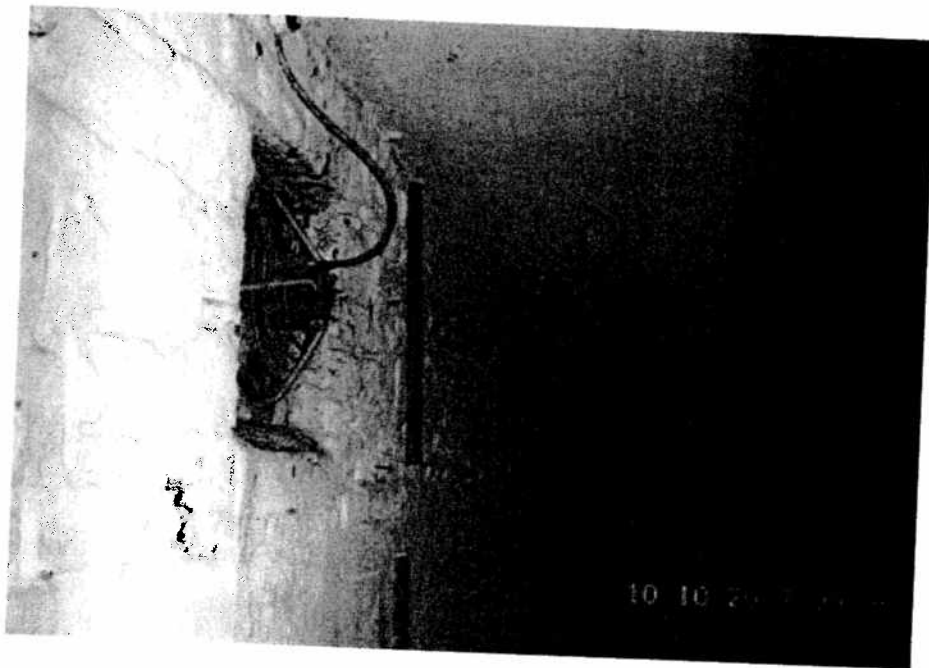


Figure 36. View of the IFR vent window and fan mounted on the north IFR wall.

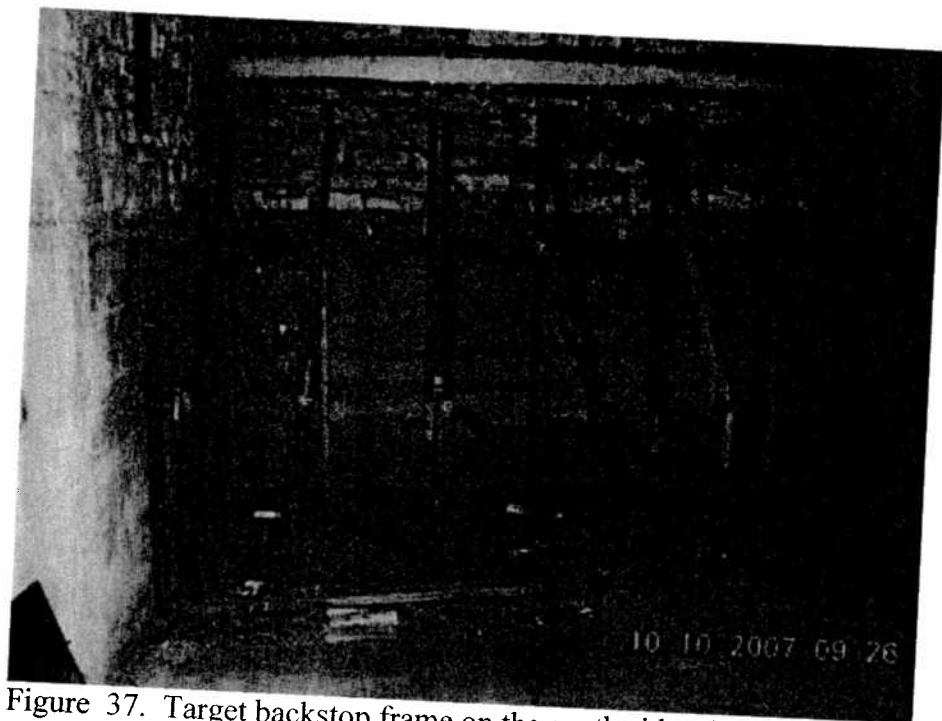


Figure 37. Target backstop frame on the south side of the IFR. No sand trap is present.

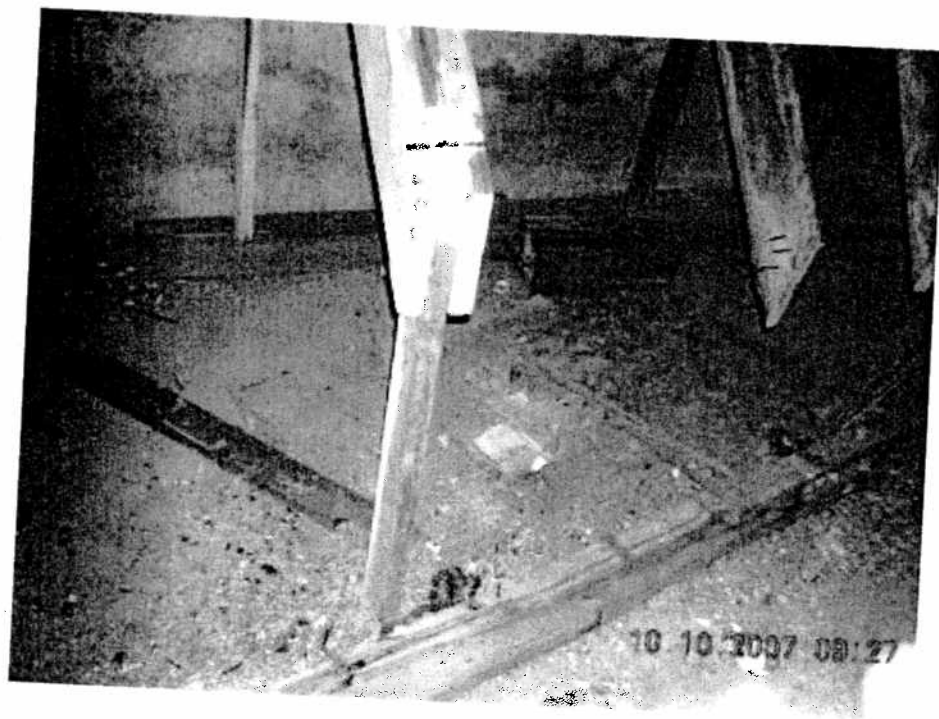


Figure 38. Dirt and debris near the backstop frame seen in figure37.

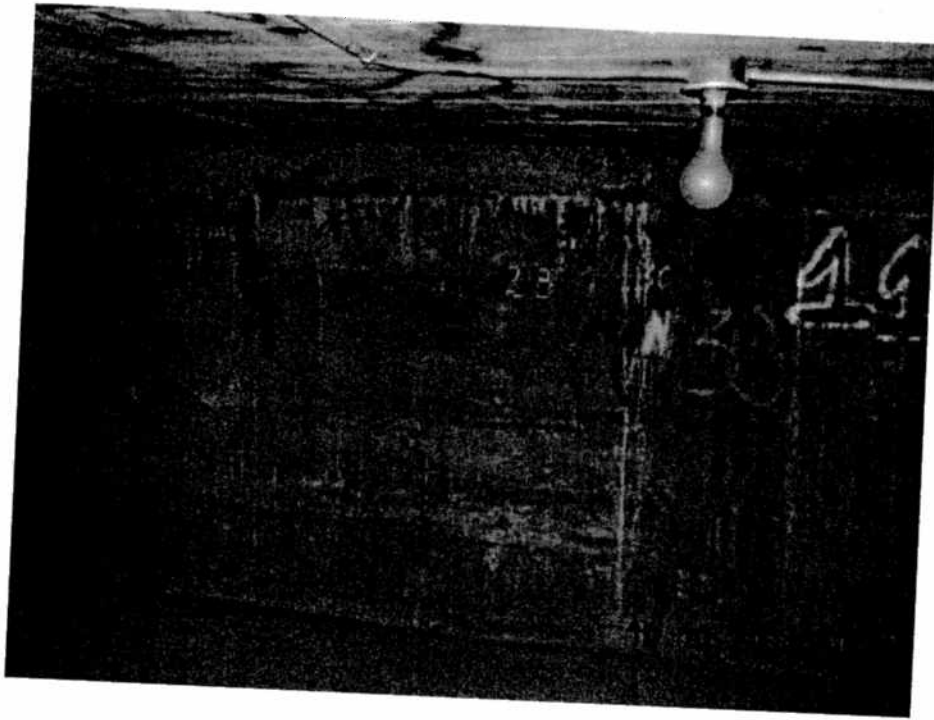


Figure 39. View of the target room west of the south part of the IFR.

Appendix C - Historical Research Documentations  
Aerial Photographs  
Topographical Map

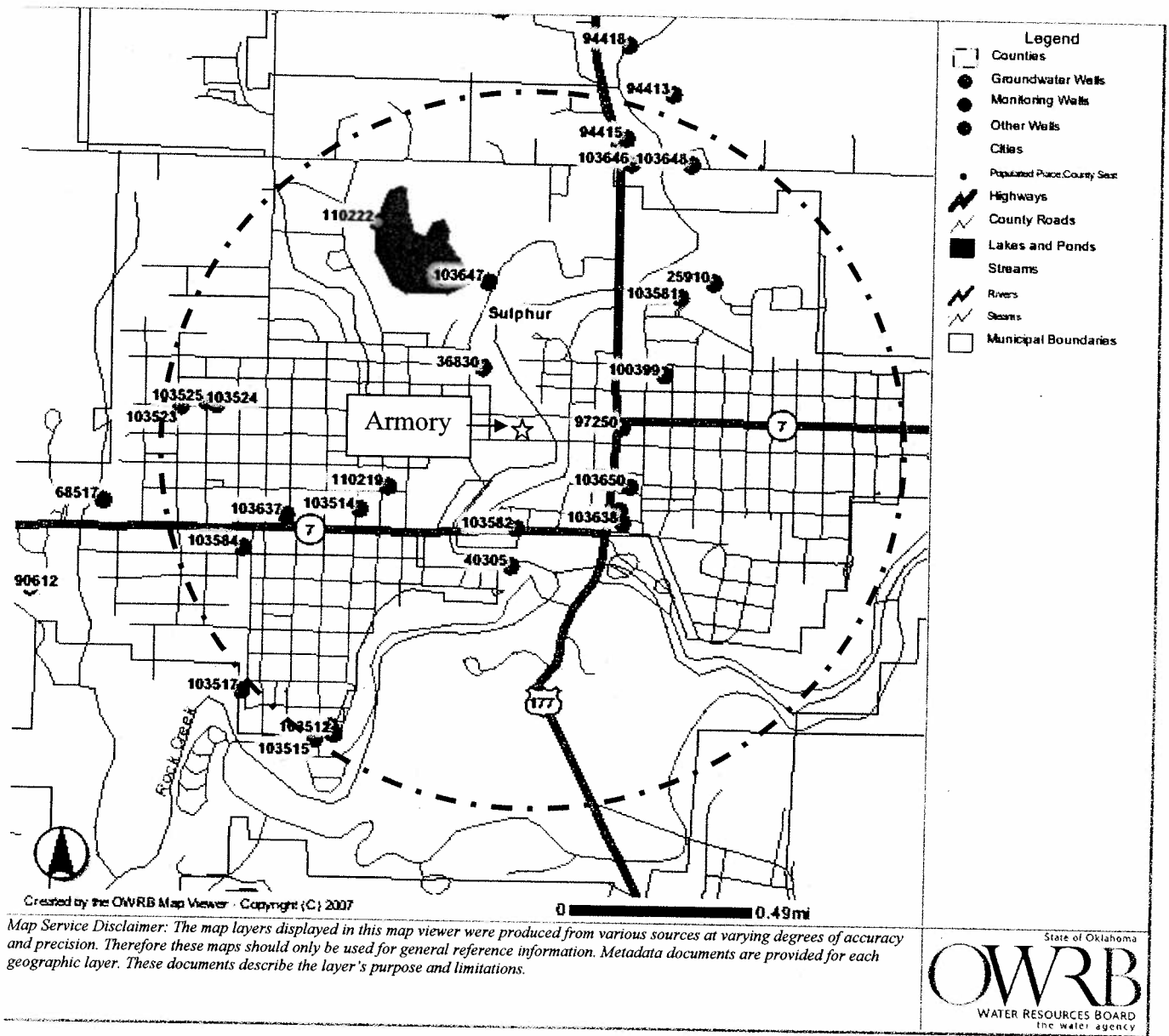


Figure 1. OWRB registered groundwater wells within a one mile radius.

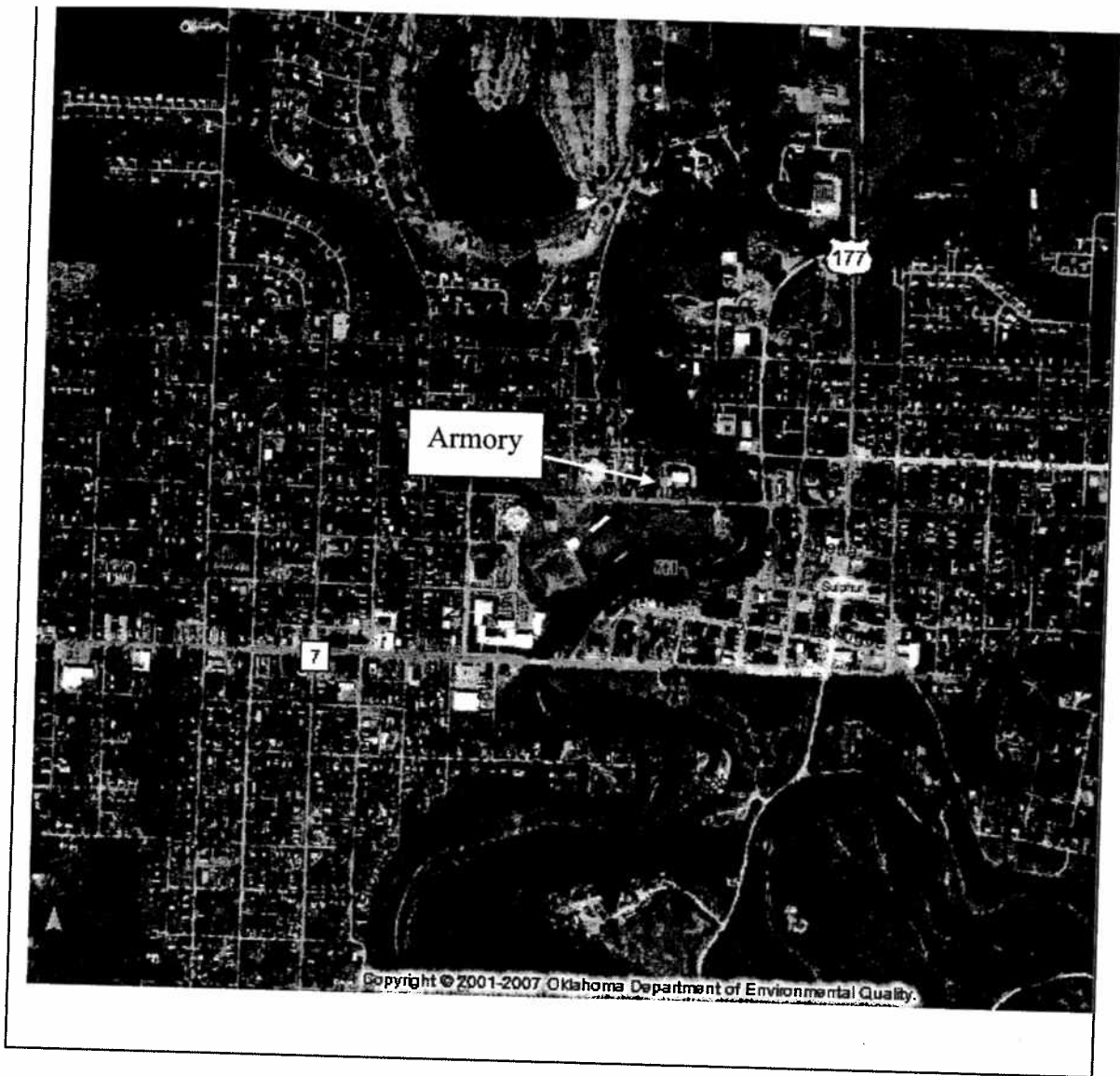


Figure 2. 2001 aerial photograph of the Armory and surrounding area.



Figure 3. 2005 aerial photograph of the Armory and surrounding area.



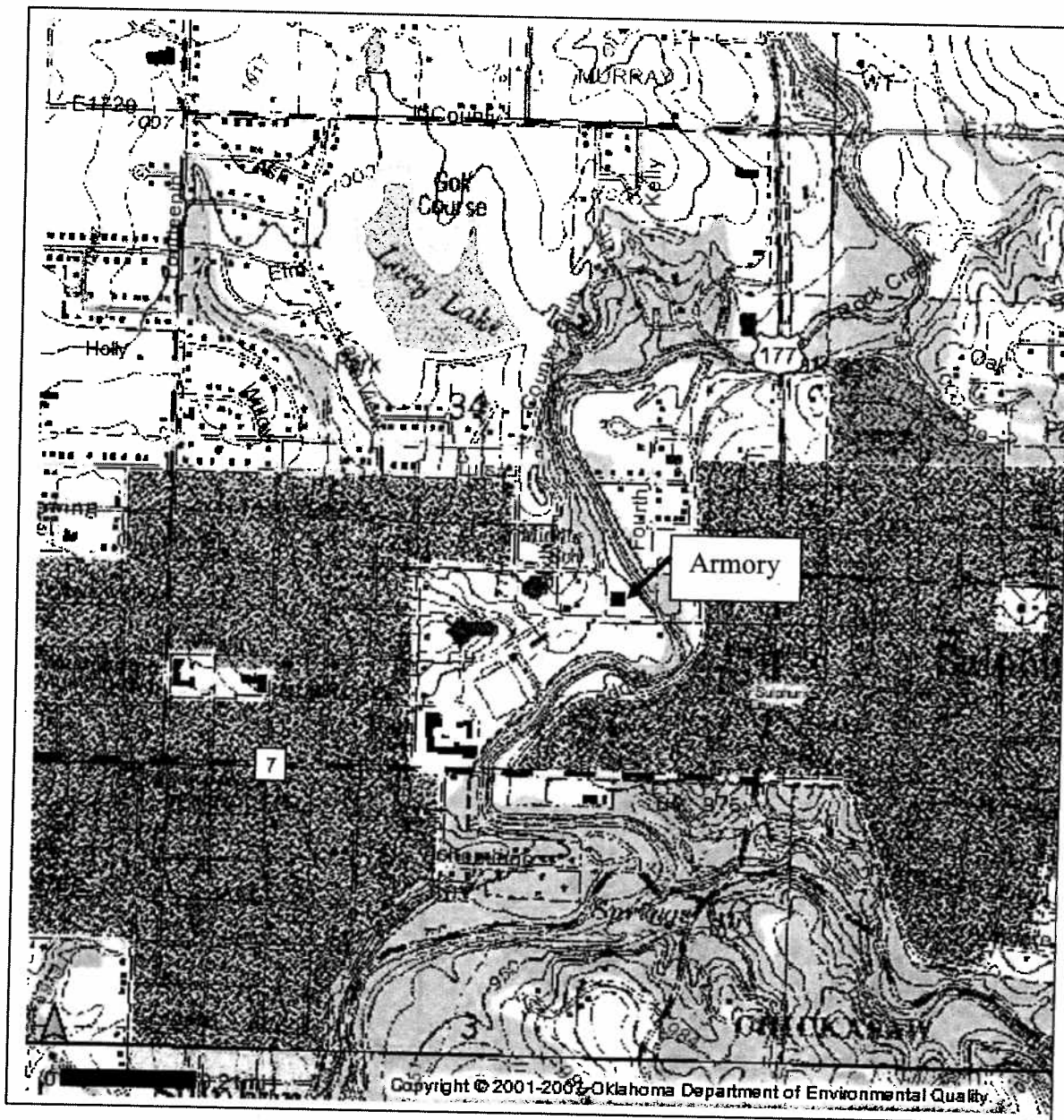


Figure 4. USGS topographic map of the Armory and surrounding area.

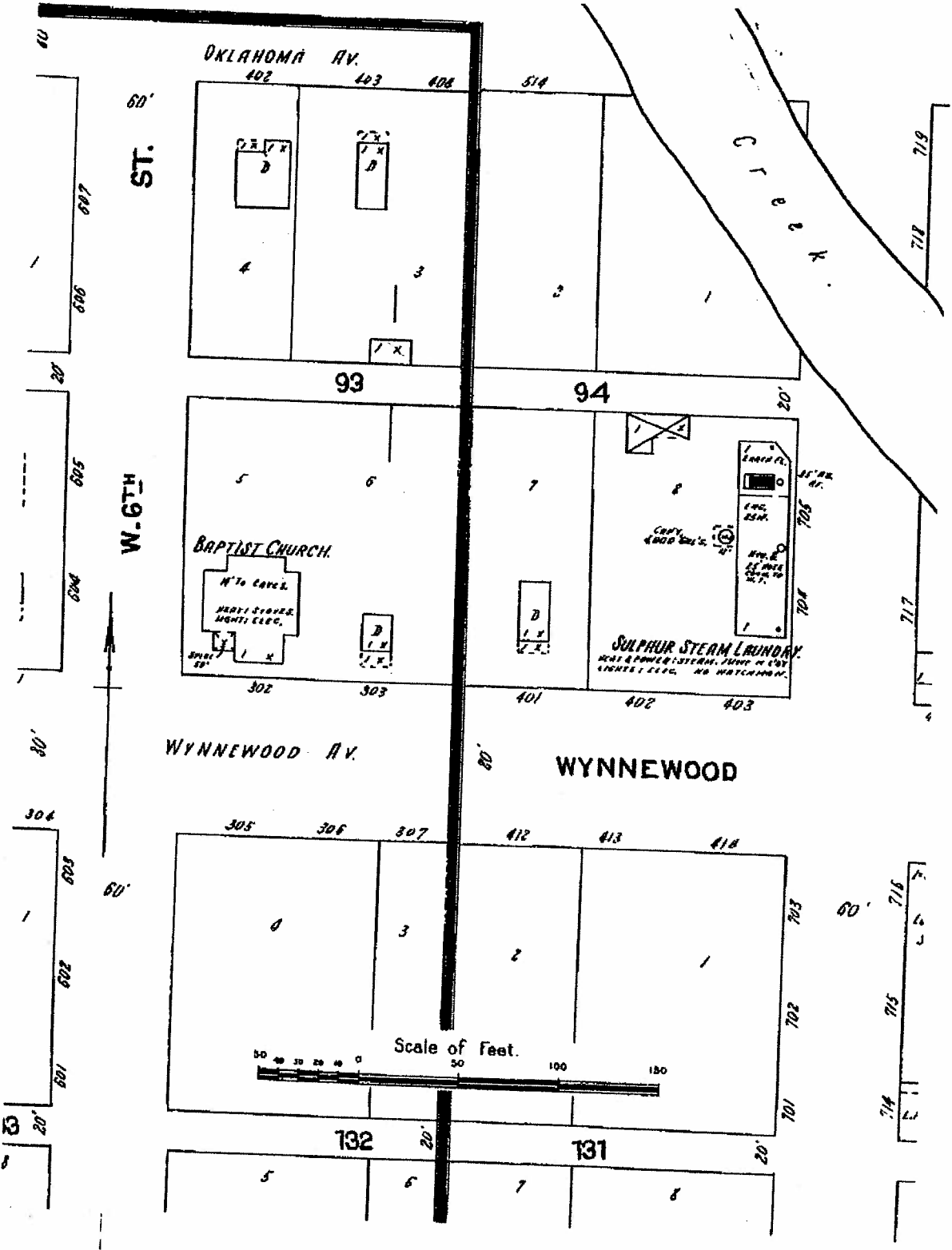


Figure 5. Sanborn insurance map of the Armory location from Nov 1906

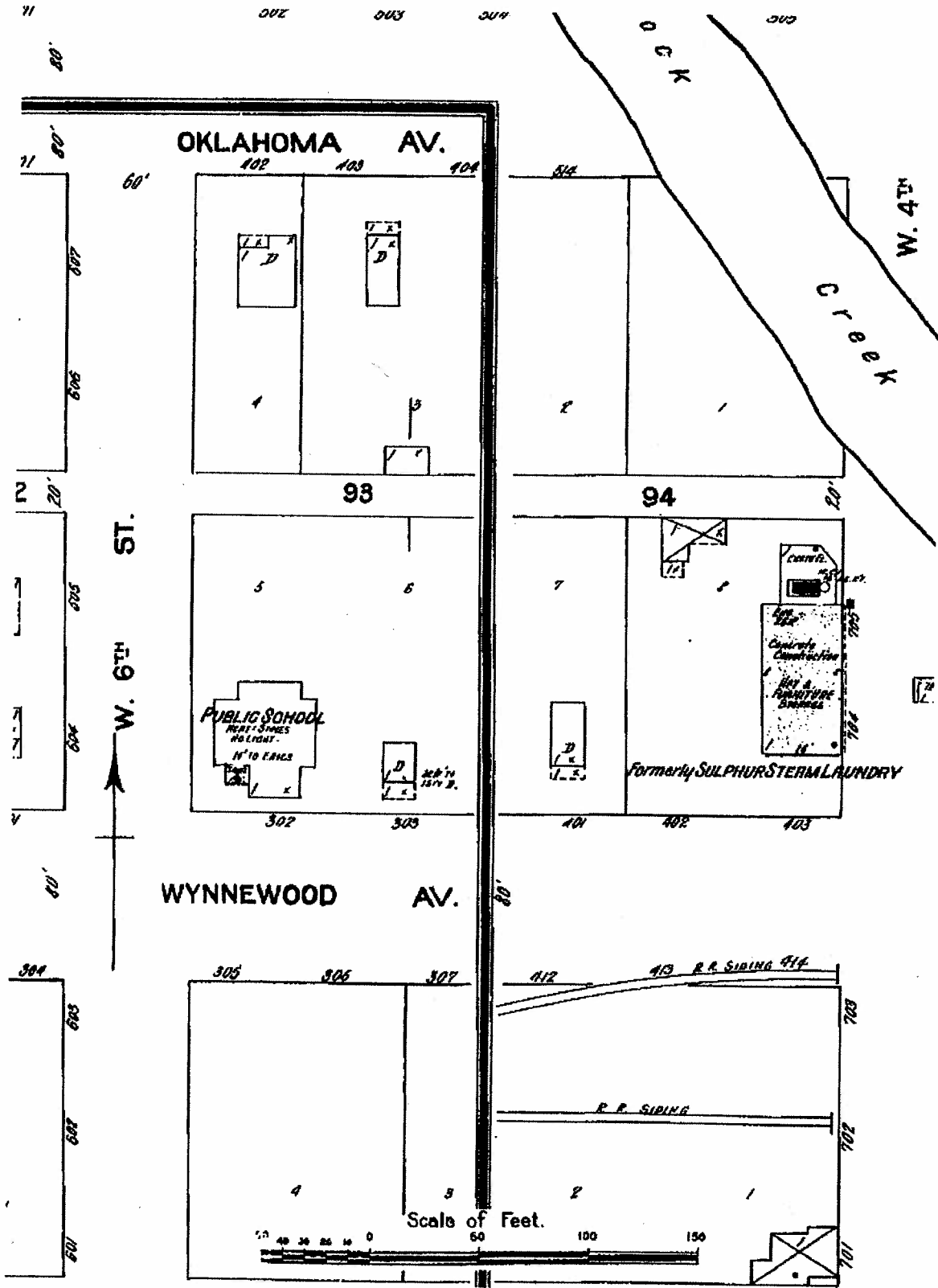


Figure 6. Sanborn insurance map of the Armory location from Jan 1911.

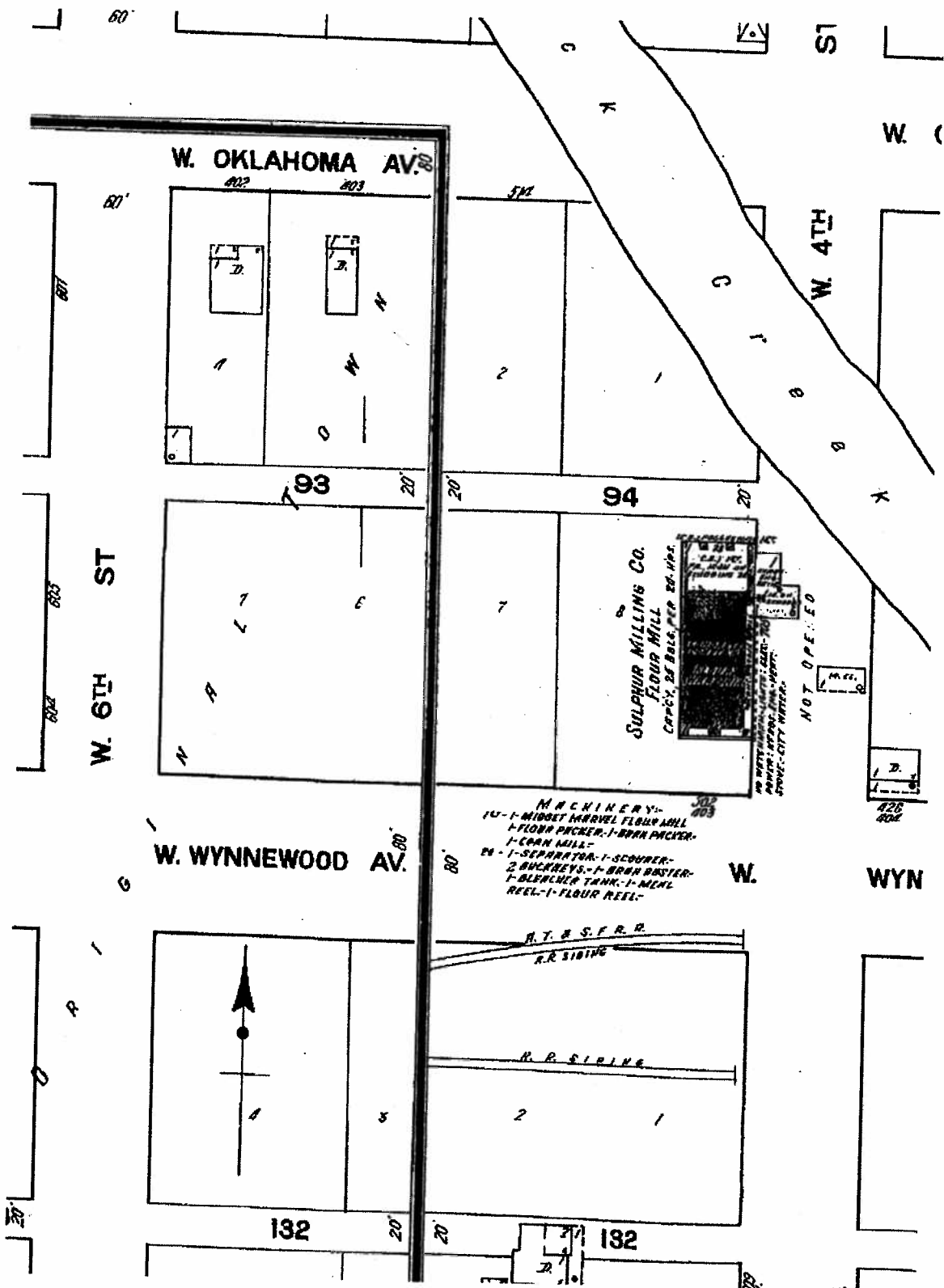


Figure 7. Sanborn insurance map of the Armory location from August 1918.

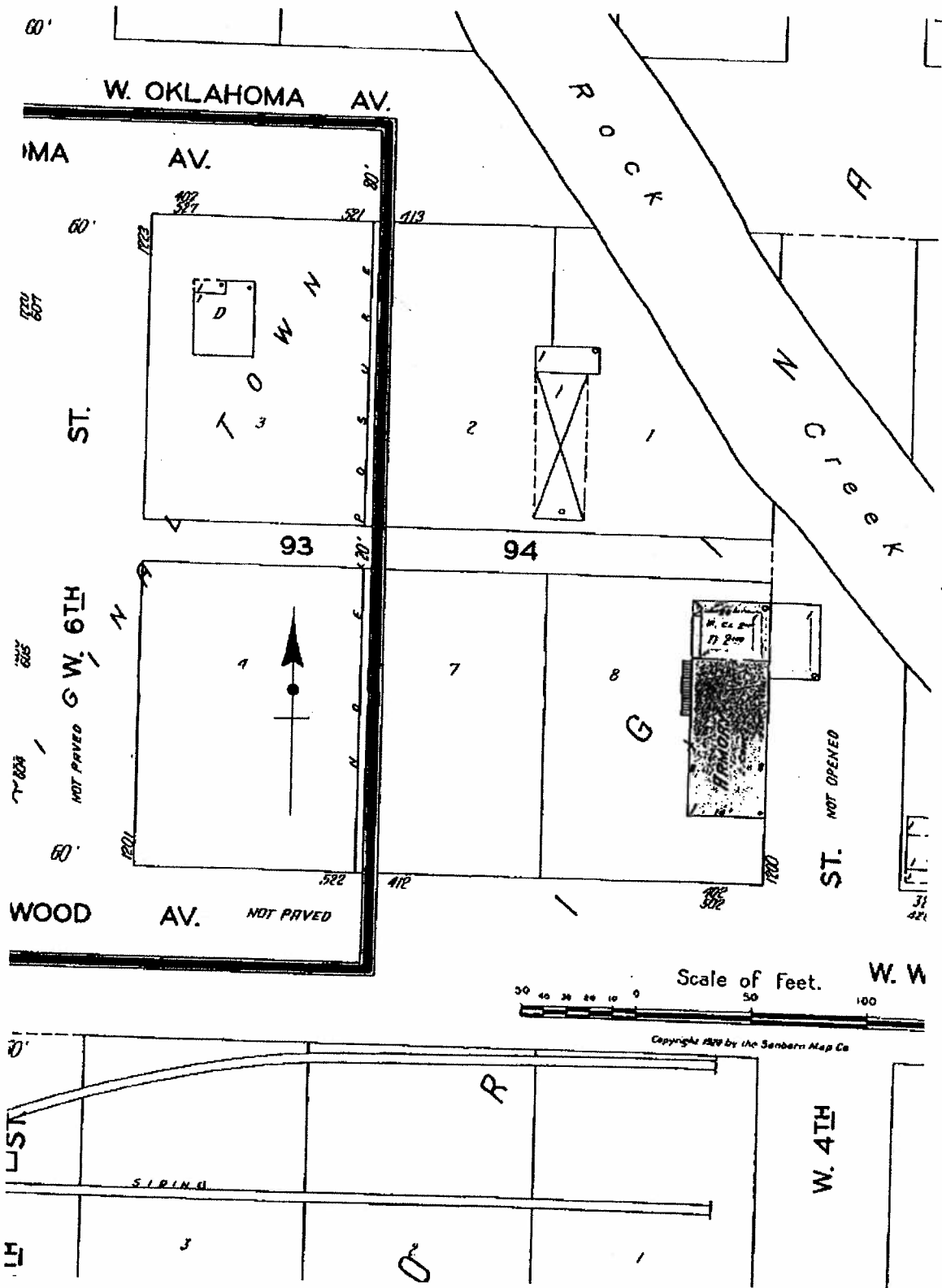


Figure 8. Sanborn insurance map of the Armory location from April 1928.

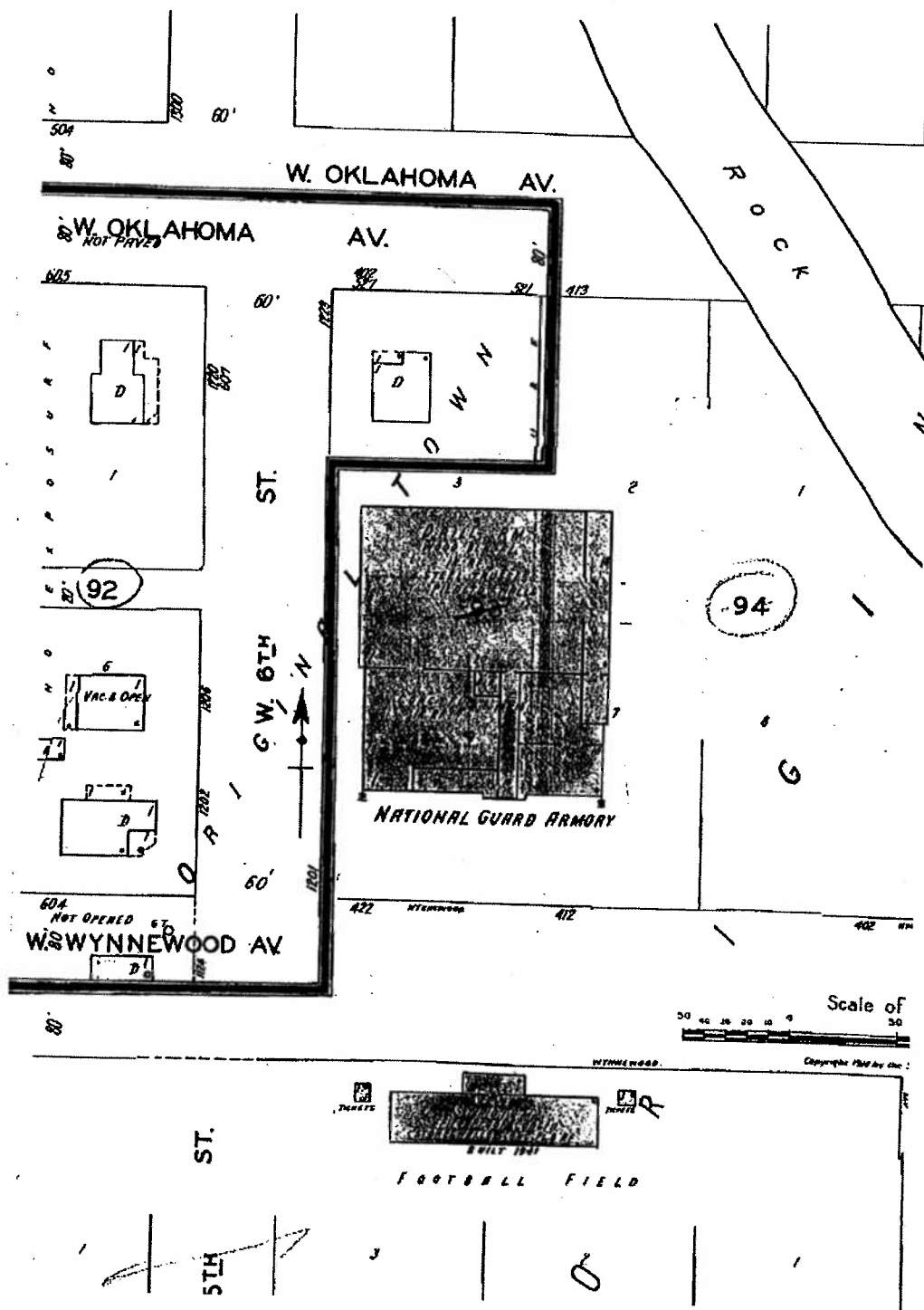


Figure 9. Sanborn insurance map of the Armory location from April 1928- May 1944.

## Appendix D - Interview Documentation

AAI Site Visit

Facility name: Sulphur Armory

Facility address: 500 W. WYNNEWOOD - SULPHUR, OK

Date of visit: 10-10-07

DEQ staff in attendance: JARROTT Kede

People interviewed/affiliation with site:

DARRYL PAINE - CO, DON PAYNE - ADMIN SUPPLY TECH, DE LANNON - 1STSGT, KATHY WOODS - SULPHUR PUBLIC WORKS DIR

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

**Asbestos**

Note: If Marshall Environmental has already surveyed for asbestos then we can get this information from their report.

Suspect asbestos containing materials (ACM):

<u>Location of ACM</u>	<u>Material</u>	<u>Notes</u>
1. <del>Suspect</del>		
2. HALLWAY FROM SERVICE BAY TO MAIN HALL - CEILING TILE - 2ND LAYER		
3. 9" FLOOR TILE, OFFICE SE OF DRUM ROOM & S of KITCHEN - FRIABLE		
4. FIRE DOOR - ASBESTOS CORE? ENTRANCE TO COMM ROOM		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		



**Military Department Property** (Please provide a detailed inventory of military property)

N Boiler present?      Y Radiator present? # of radiators \_\_\_\_\_

Rooms radiator(s) present in: <sup>ALL</sup> OFFICES - 5-5100, LEAVING UTILITY IN DRIVE FLOOR

Y Old lighting ballasts present?

Rooms old lighting ballasts present in: OFFICES

---

<u>Type of property</u>	<u>Amount</u>	<u>Room Located In</u>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

**Utilities**

City water     Well     City sewer     Septic tank

<sup>ONG</sup> Natural gas     Propane    OLE, CHICKASAW TOWER

**Underground features**

USTs removed    NO Vent pipes present     USTs not removed

**Above ground features** NO

Cisterns present     ASTs     Impoundments

**Structures on adjoining property**

Residential, commercial structures, churches, schools etc  
Residential none  
School - S + W

**Onsite information**

N Air Emissions      \_\_\_ Wastewater Discharge - IFR Sump Discharge Pipe  
CURRENTLY UNHOOKED + NO PUMP  
PAST <sup>IFR</sup> FLOODING DISCHARGED TO CREEK

**Industrial activities**

N Monitoring wells    Location:

N Stained soils        Location:

N Seeps                Location:

Y Chemical spills    Location: DE MINIMIS OIL STAIN FROM A  
PARKED VEHICLE

N Oil and Gas Exploration    Describe:

N Known Groundwater or Surface Water contamination

*Describe:*

N Farm Wastes

N Known Pesticide Misapplication

N Discharges and Runoff from Adjacent Property Affecting the Site

N Transformers/PCB Equipment    Location:

*Describe:*

Other known or Suspected Environmental Concerns On the Site

LEAD DUST FROM BASEMENT IFR

Historical Recognized Environmental Conditions On the Site

UST - Removed

AST - Spill in mid 60's - Removed

## Current Use of the Property

### Descriptions of Structures, Roads, Other Improvements on the Site

GRAVEL DRIVEWAY

### Description of adjacent properties

SCHOOL FOOTBALL FIELD SAND  
SCHOOL BLD WEST  
Residential N + E

### Owner, Property Manager, and Occupant Information

- OK DEC OWNERS/MAINT
- SULLY SCHOOL DISTRICT MAINT

### Additional Environmental Record Sources

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

LAND USE RESTRICTED TO PUBLIC FACILITIES + INST TOWER

### Physical Setting Sources

USGS, USDA, EPA, OK CLIMATOLOGICAL RECORDS, DOL

### Historical Use Information on the Property

OK NATIONAL GUARD - 1936 - 2000s

CHICKASAW TRIBE (BRIEFLY OWNED) + REMOVE FLOOR TILES

CURRENTLY VACANT

~~PRISON~~

**Historical Use Information on Adjoining Properties**

ADJACENT PROPERTY REMAINS AS IT WAS SOME APPROX 50'S  
SEMI-CROPPED SOUTH OF ARROYO WAS USED AS FARM GROUNDS

**Site Reconnaissance**

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

PEDESTRIAN WALKTHRU + WINDSHIELD SURVEY

**General Site conditions:**

External observations NONE

Stained soil or pavement  Stressed vegetation  Solid waste

Other:

Internal observations

Odors  Pools of liquids  Drums

Stains or Corrosion on floors, walls, or ceilings

MINT MUST STAIN FROM FANOT IN VEHICLE WAS A BAY  
MINT OIL STAIN IN VEHICLE WAS A BAY FROM PARKED VEHICLE

Other:

**General notes:**

## Appendix E - Qualifications of Environmental Professionals

## **Appendix E – Qualifications of Environmental Professionals**

**Jarrett Keck** holds a Bachelor 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.**, Rita R. Kottke, Ph.D., is the Brownfield Program Manager and Superfund Removal Coordinator for the Land Protection Division of the Oklahoma Department of Environmental Quality (DEQ). She is the agency's technical and policy expert in cross-jurisdictional redevelopment of contaminated property. She was heavily involved in the formulation of DEQ's Brownfield Program, the development of the Brownfield Cleanup Revolving Loan Fund, and the negotiation of the State's Brownfield Memorandum of Agreement with EPA. She has been with the agency for 15 years, working in the Superfund and Brownfields Programs. She holds a Doctorate in Environmental Sciences from Oklahoma State University.

**Angela Brunzman** holds a Bachelors Degree in Environmental Science and a Masters Degree in Construction Science from the University of Oklahoma. Ms. Brunzman has 12 years experience working for the state of Oklahoma in the environmental remediation field. Duties have included managing Superfund sites, coordinating with local, state, and federal agencies, and currently managing the state Site Cleanup Assistance Program.

Appendix F

Lead Survey

October 2005

## 44.0 SULPHUR ARMORY

C.H. Guernsey & Company (GUERNSEY) surveyed the indoor firing range (IFR) at the Sulphur Armory on January 10, 2005 (Photographs 44-1 through 44-40). The IFR is approximately 100 feet long, 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 room that was once used to store ammunition and other equipment. The ventilation system within the IFR consists of a fan located in the exterior wall and vented directly to the outside.

Based upon information supplied to GUERNSEY, Oklahoma Military Department (OMD) personnel collected two wipe samples on April 5, 2004: one from a window sill and the other from the drill floor. Concentrations of lead on the drill floor were 246  $\mu\text{g}/\text{ft}^2$  and concentrations on the window sill were 907  $\mu\text{g}/\text{ft}^2$ . In addition to the lead contamination, the majority of the drill floor was covered with suspect asbestos containing floor mastic. Table 44-1 summarizes the laboratory results for the wipe samples.

Table 44-1  
Laboratory Analysis

Sample ID #	Sample Date	Result ( $\mu\text{g}/\text{sq. Ft.}$ )	Lab Report ID #
NIA	4/05/2004	246.85	NIA
NIA	4/05/2004	907.75	NIA

**Note:**

NIA = No information Available

OMD identified three canvas tents within the IFR for cleaning.

Table 44-2 provides a preliminary cost estimate to clean the equipment and/or remediate the lead contamination in the IFR. Figure 44-1 shows the approximate locations of the OMD samples.

### 44.1 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 44-2  
Preliminary Cost Estimate

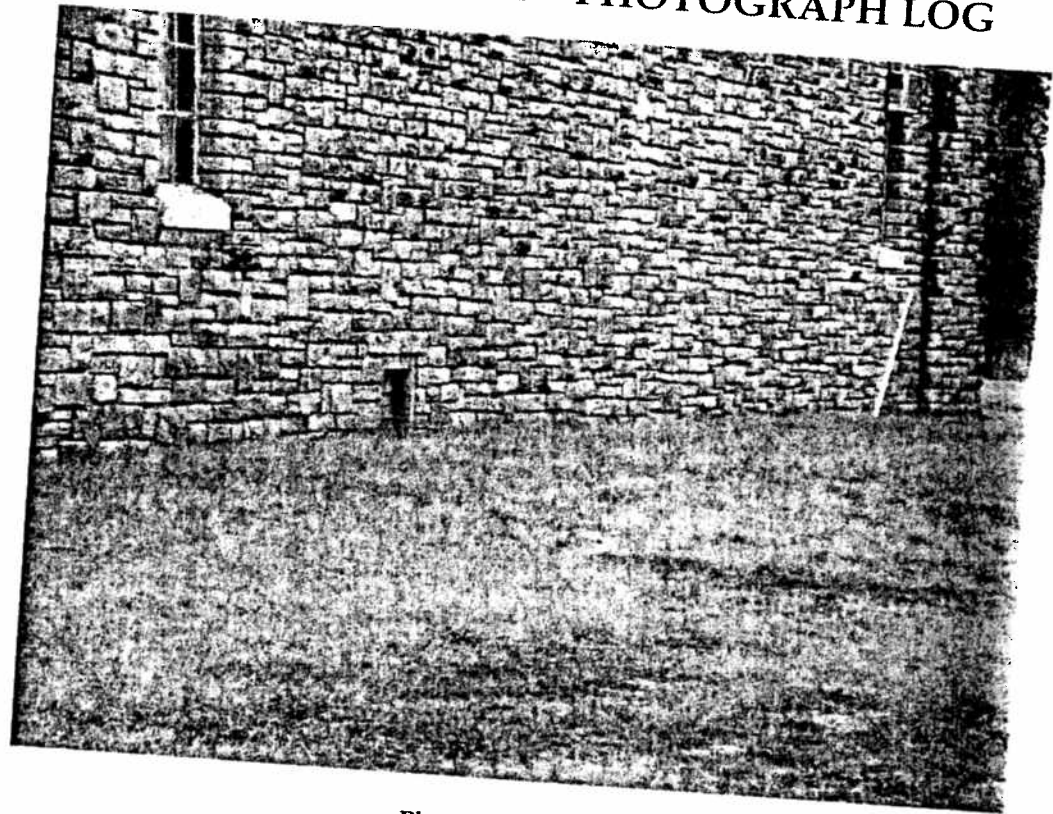
Item Description	Number	Unit	Cost Per Unit	Total Cost
Canvas Tents	3	Each	\$300	\$900
<b>Total</b>				<b>\$900</b>

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	\$1,000	\$1,000
Cleaning of Army Equipment (a)	N/A	N/A	N/A	\$900
Clean/Seal Firing Range surfaces	6300	ft <sup>2</sup>	\$5	\$28,350
Clean Drill Floor Surfaces (c)	8500	ft <sup>2</sup>	\$0.25	\$2,125
Waste Disposal (non-hazardous)	2	Ton	\$1,000	\$2,000
<b>Total (+/- 25%)</b>				<b>\$35,875</b>

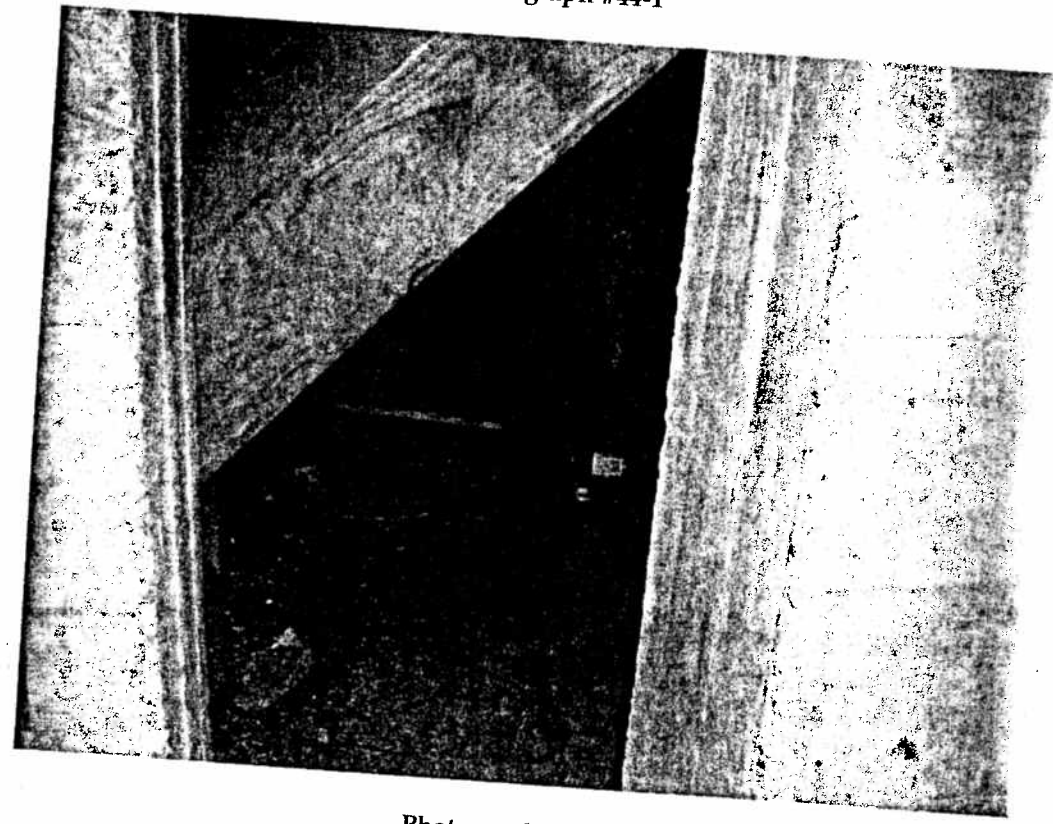
**Notes:**

- (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/ft<sup>2</sup>.

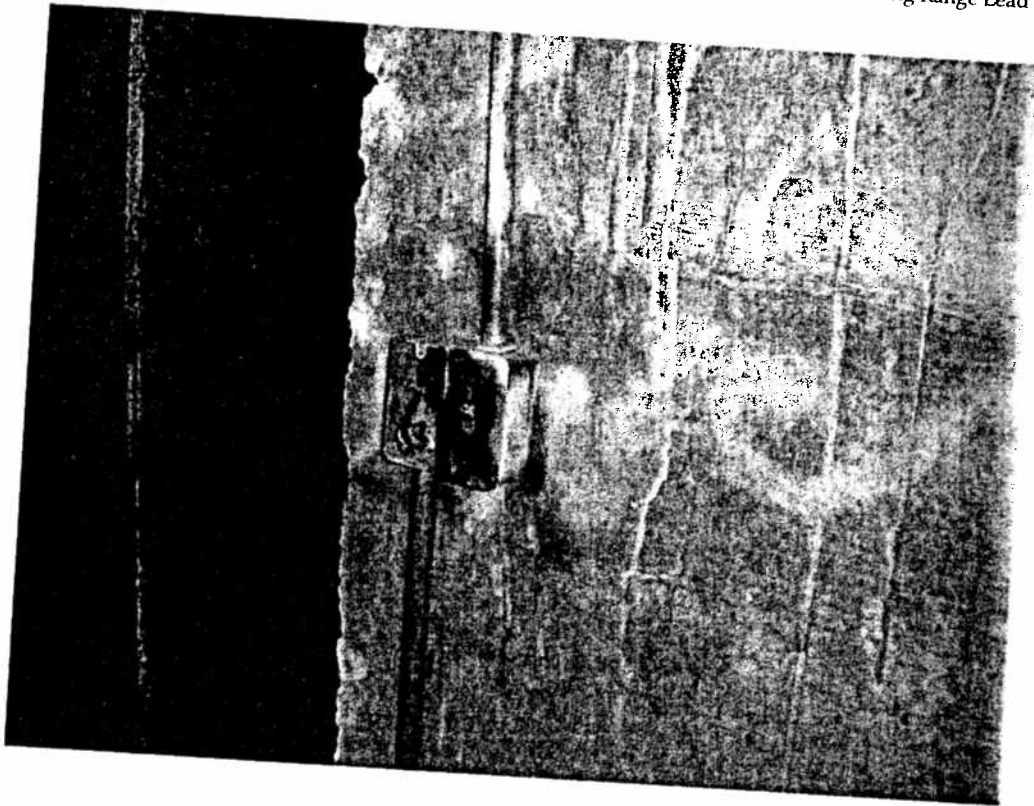
# SULPHUR ARMORY - PHOTOGRAPH LOG



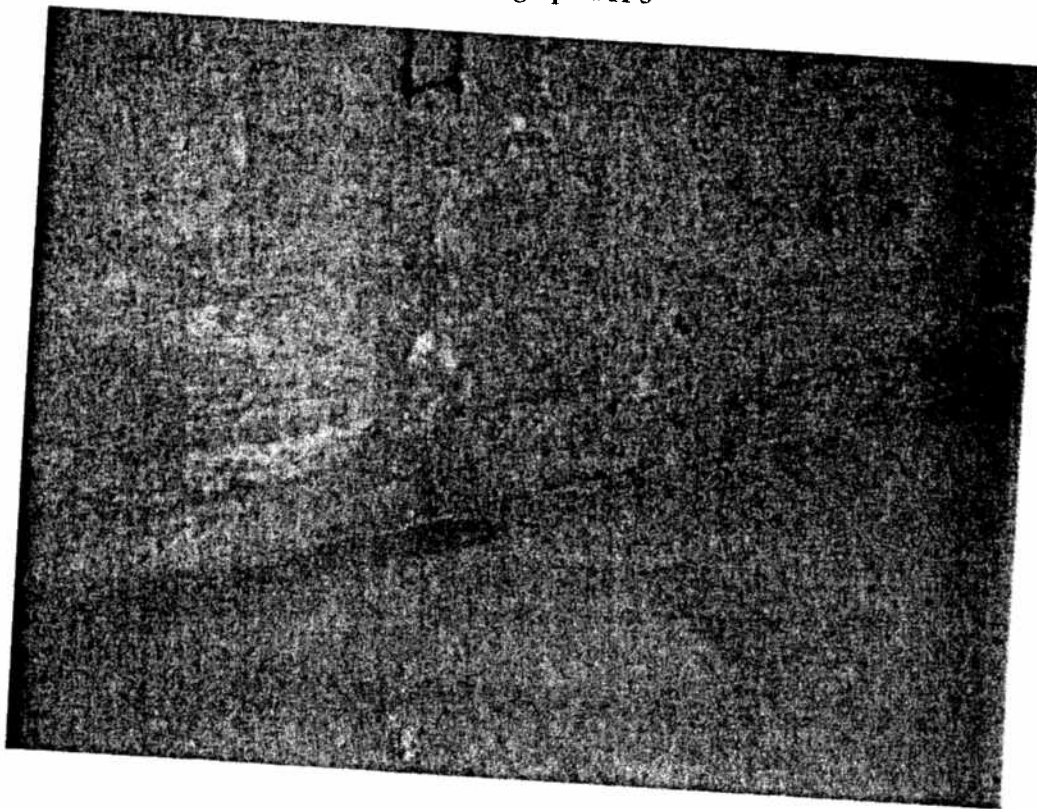
Photograph #44-1



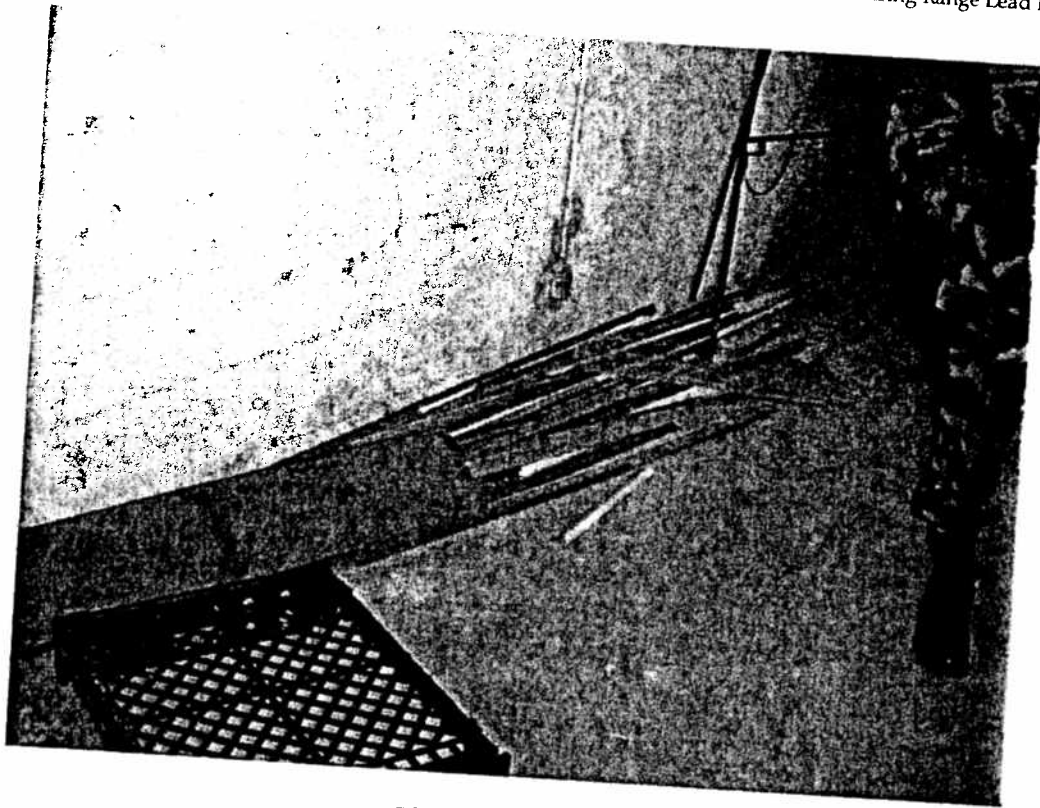
Photograph #44-2



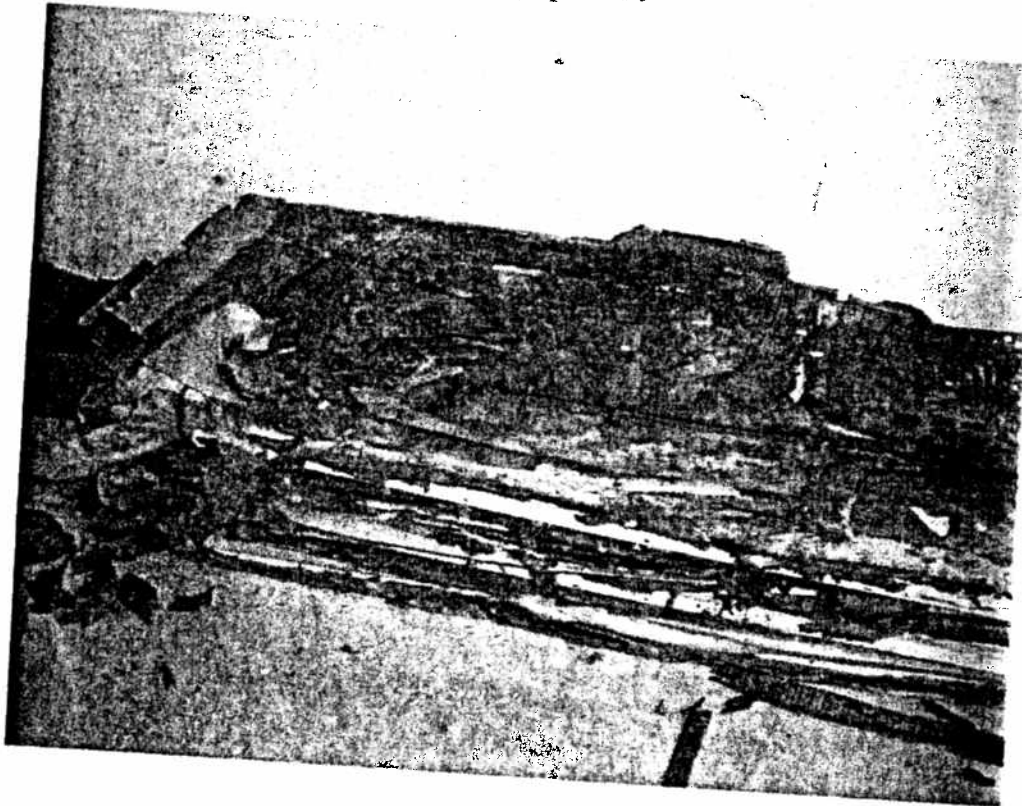
Photograph #44-5



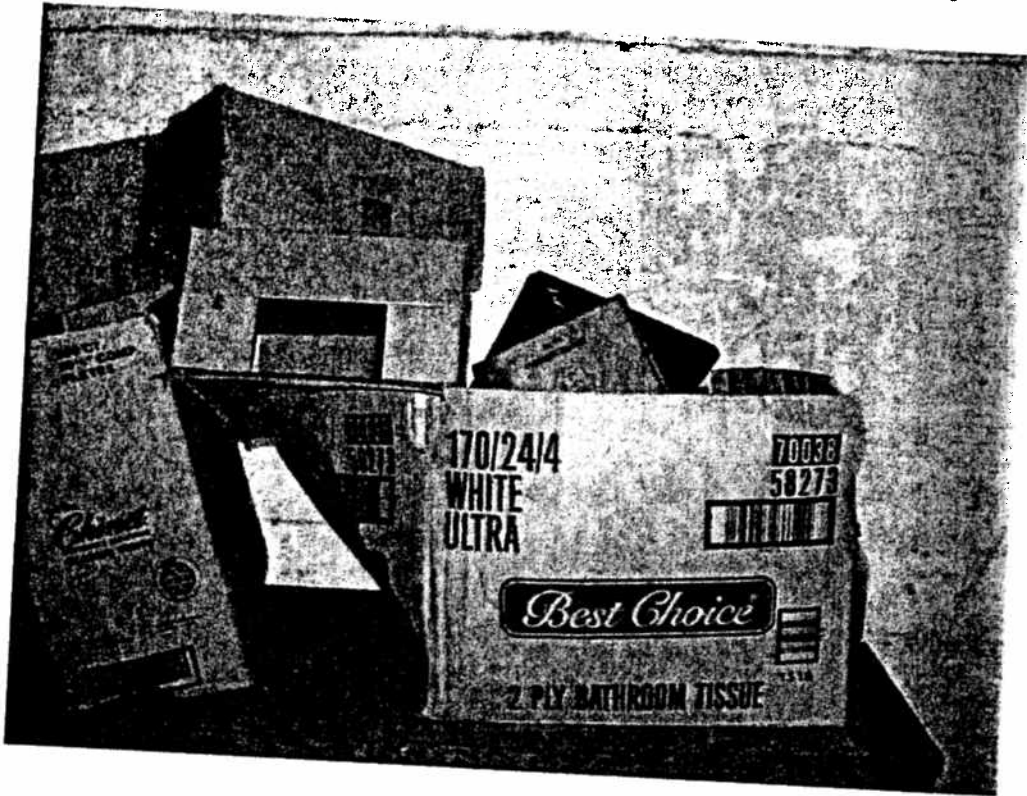
Photograph #44-6



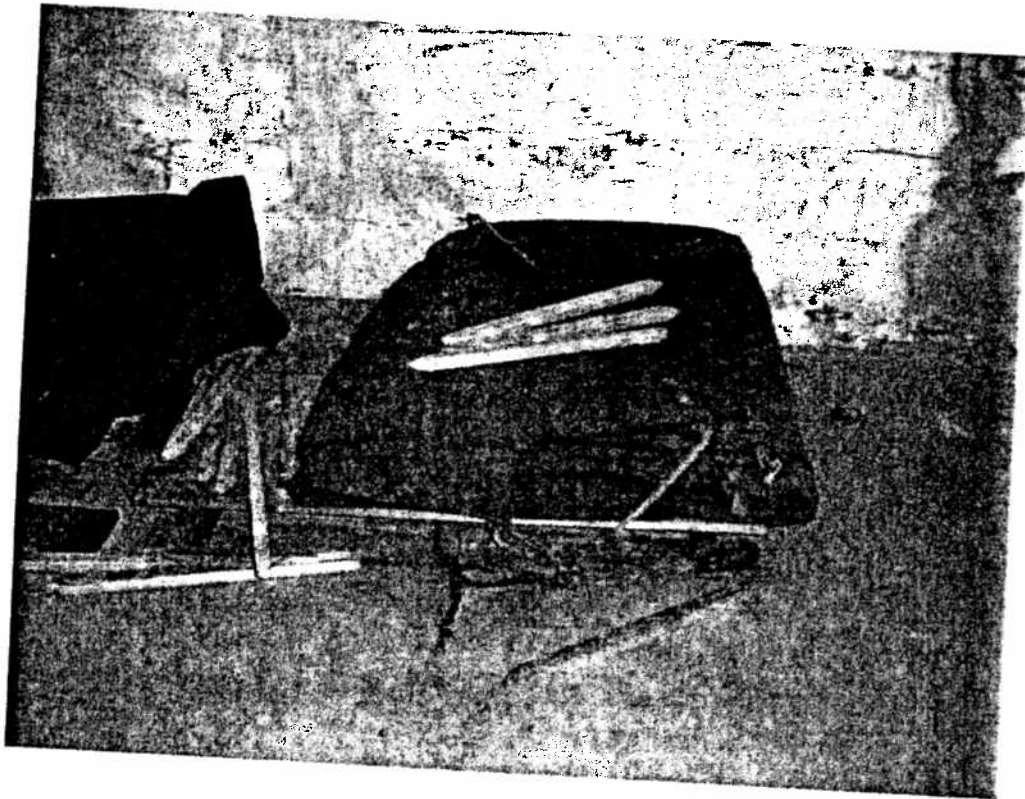
Photograph #44-9



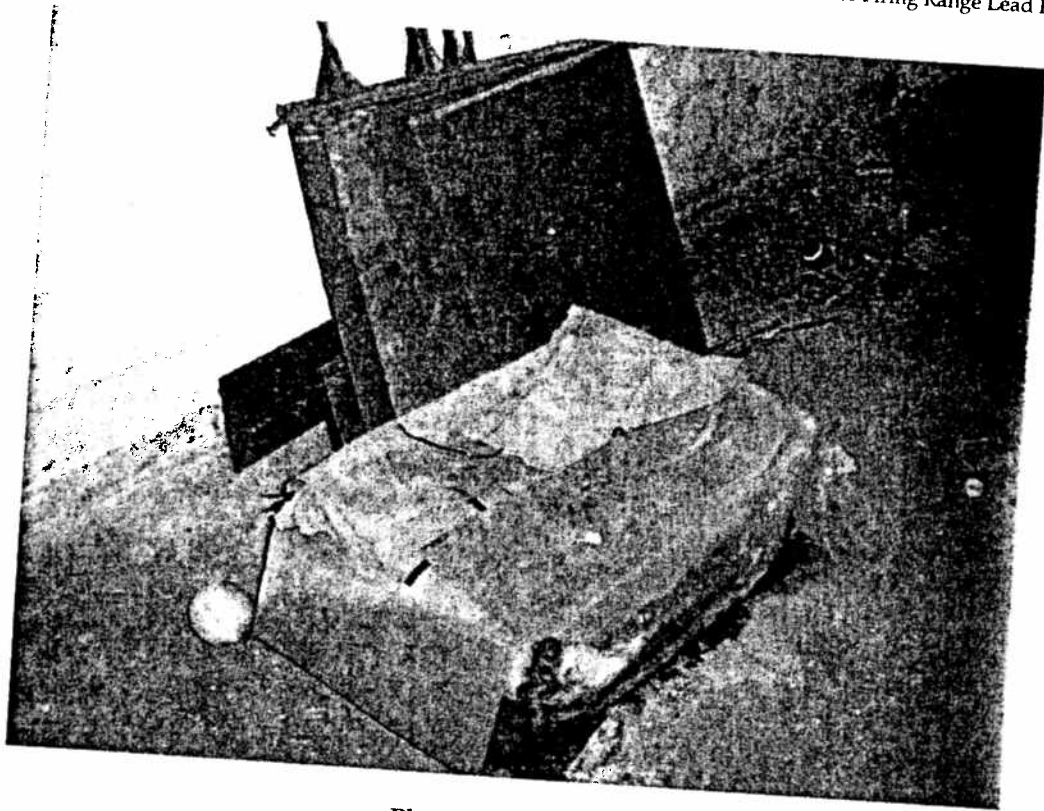
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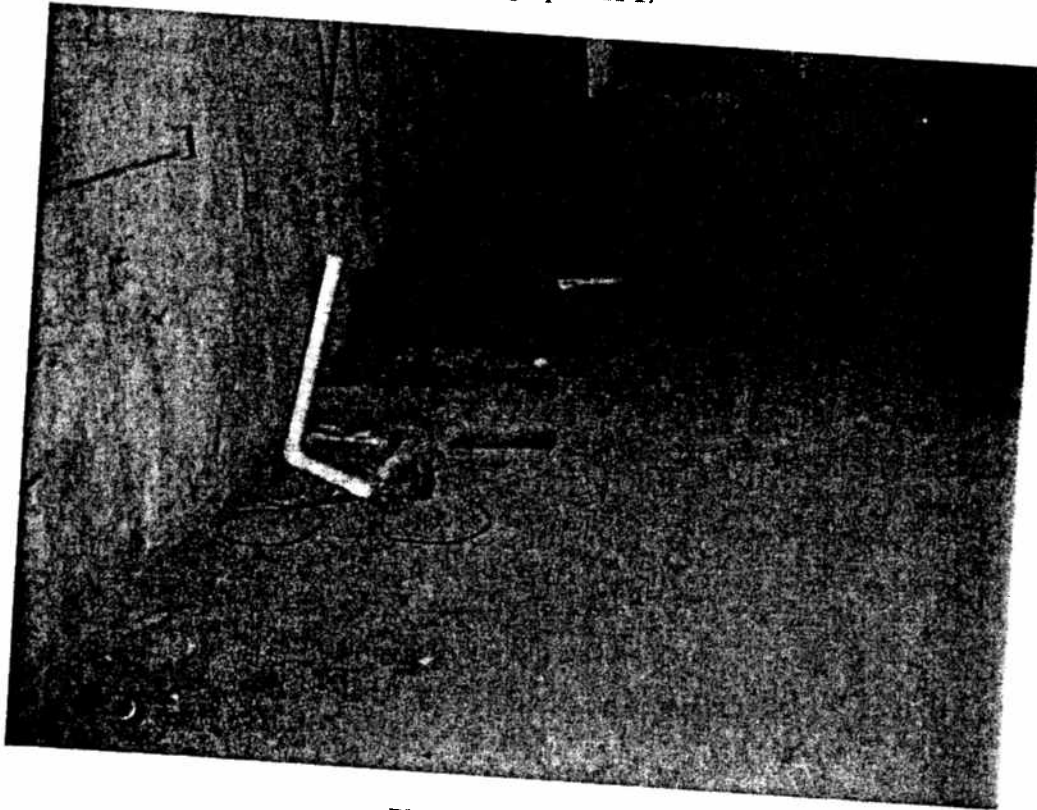
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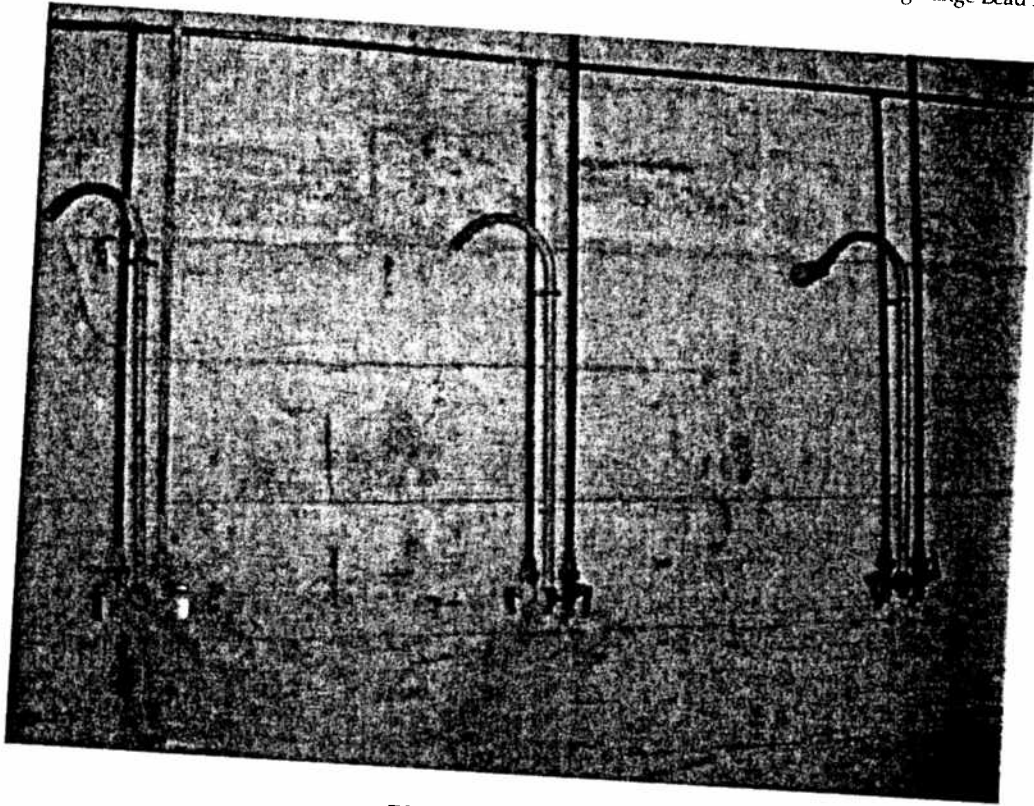
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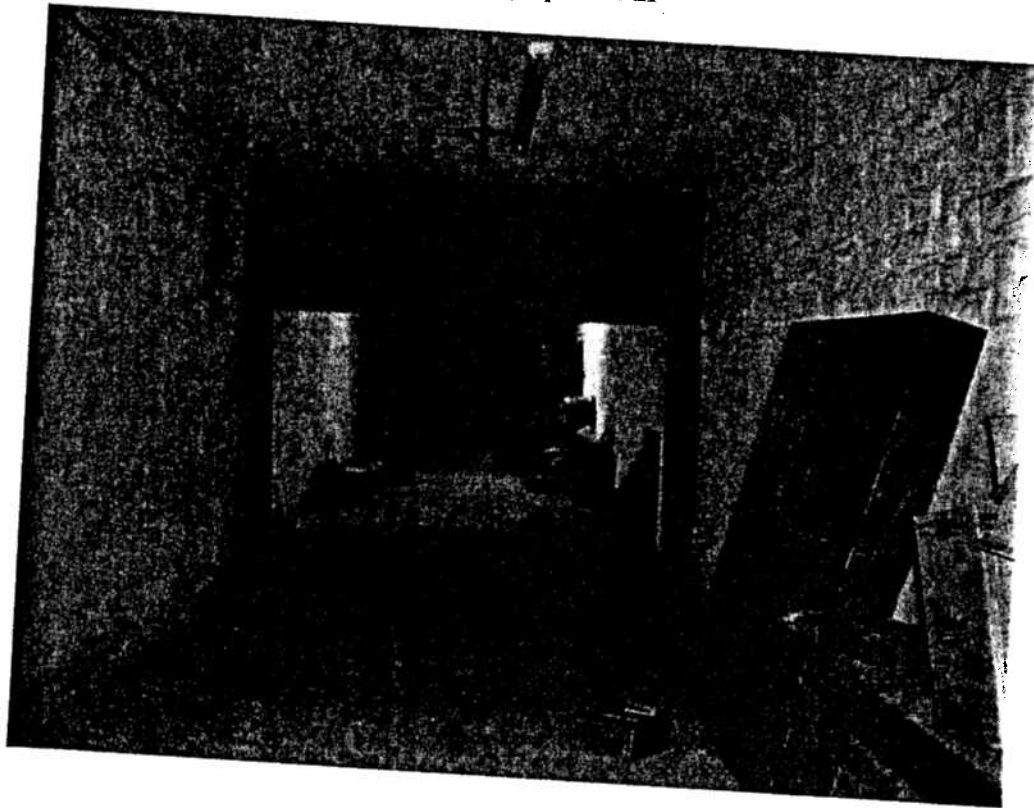
Photograph #44-17



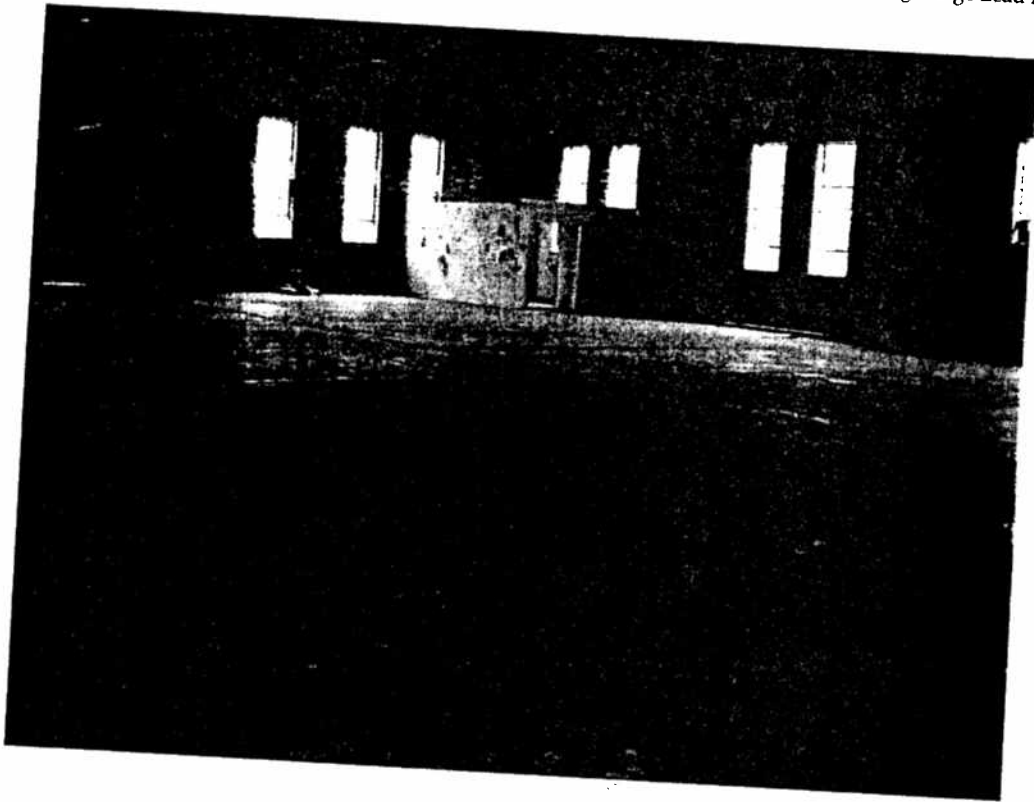
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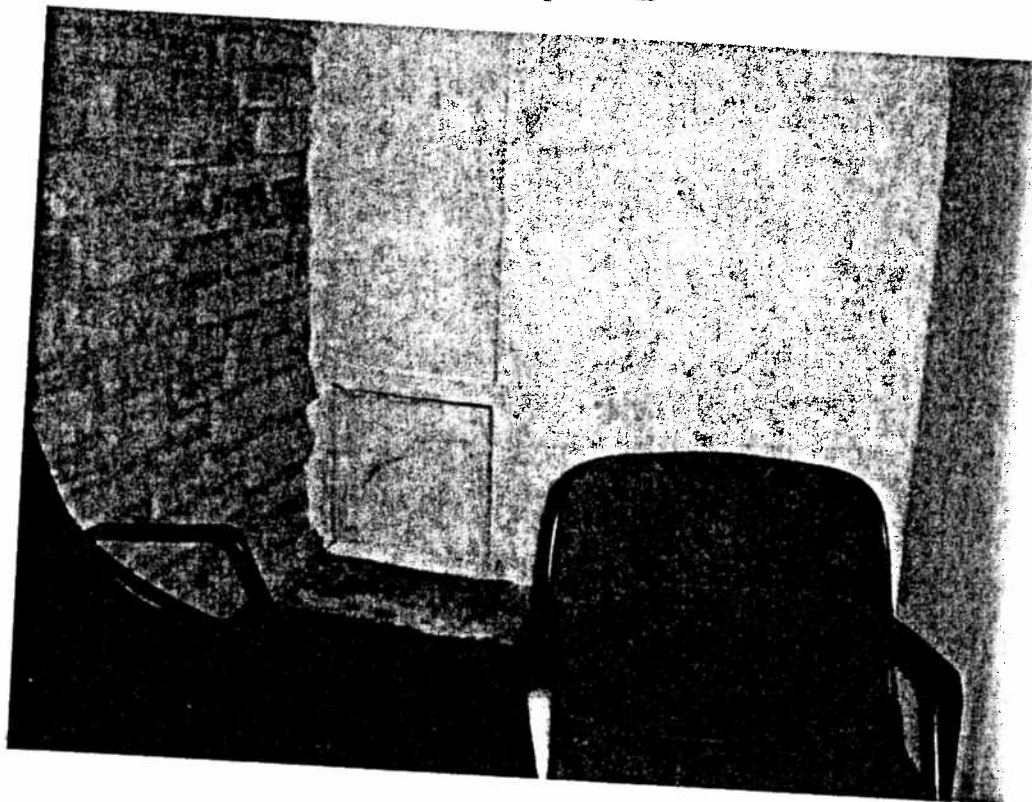
Photograph #44-21



Photograph #44-22

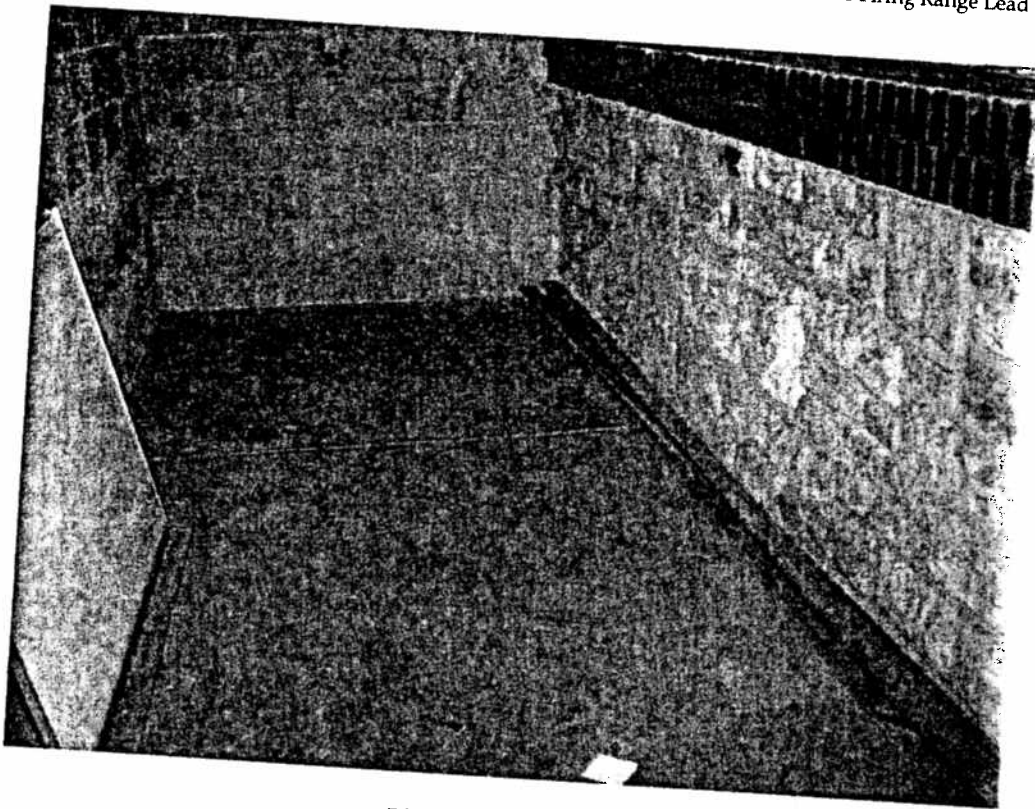


Photograph #44-25



Photograph #44-26

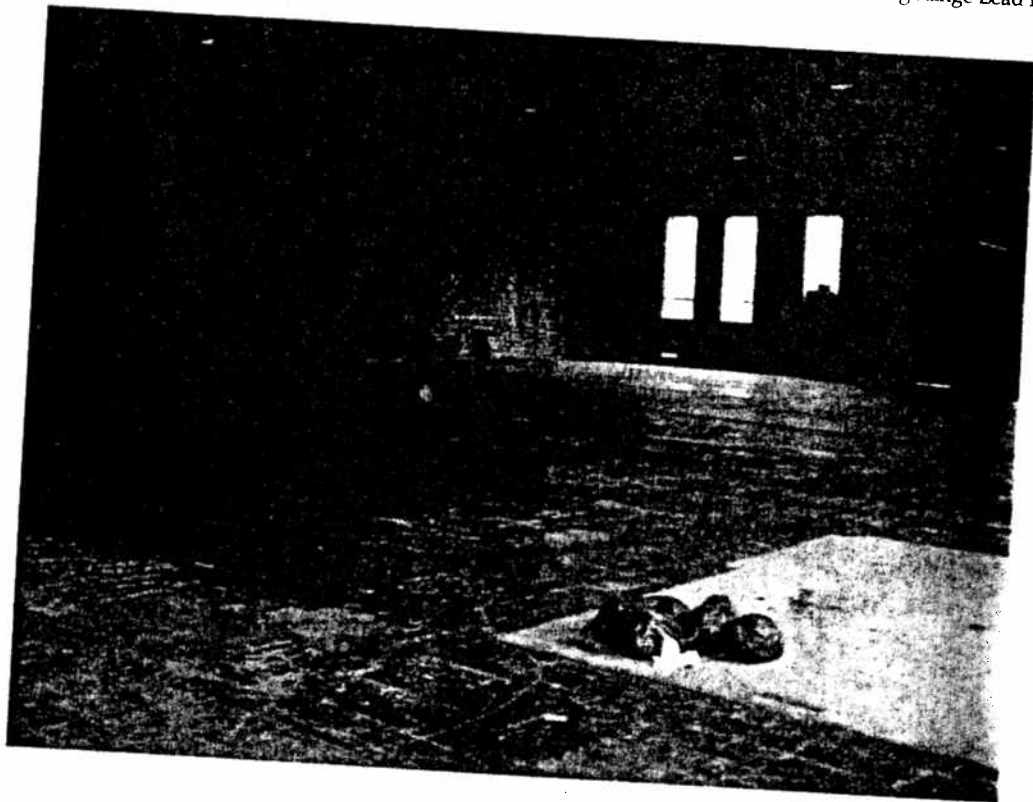




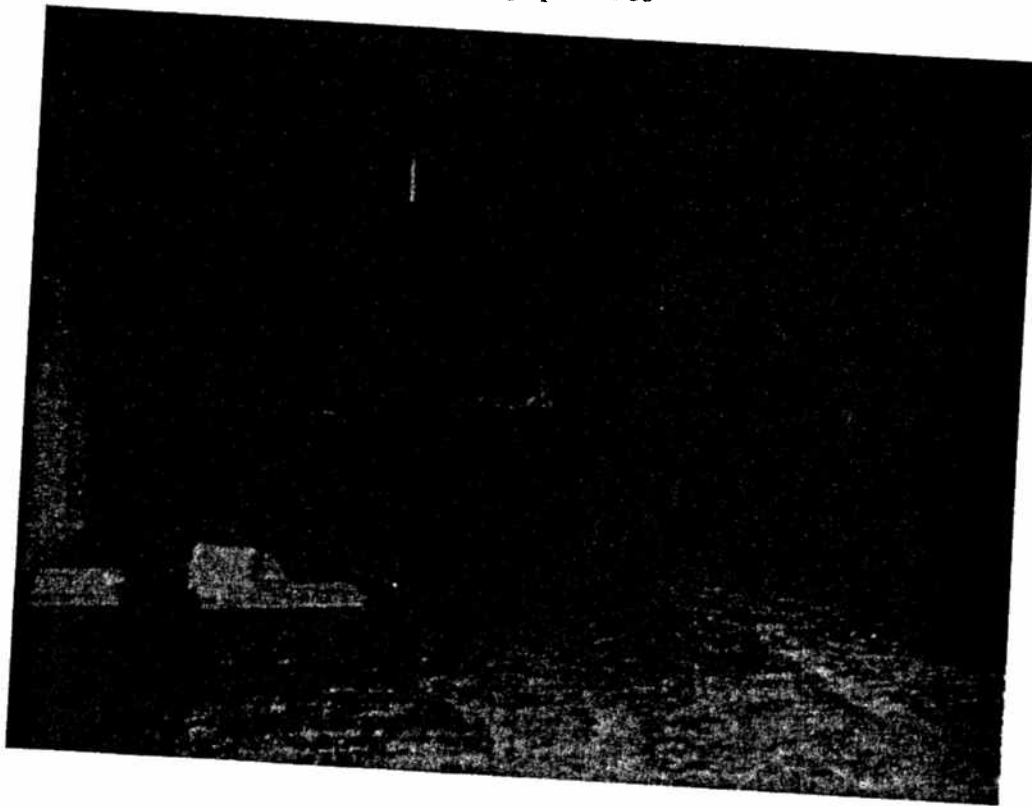
Photograph #44-29



Photograph #44-30



Photograph #44-33



Photograph #44-34