



# Cleveland County

## Hazard Mitigation Plan

2014 – 2019



**Developed by:**

Cleveland County Hazard  
Mitigation Planning Team



**Prepared by:**

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*Eufaula, Oklahoma*

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PLACE HOLDER  
For  
Cleveland County  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Cleveland County Commissioners intend to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
Little Axe Public School District  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Little Axe Public School Board of Education intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
Robin Hill Public School District  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Robin Hill Board of Education intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
Moore-Norman Technology Center  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Moore-Norman Technology Center intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
Town of Etowah  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Etowah Trustees intend to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
Town of Lexington  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the City Council of Lexington intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
Lexington Public School District  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Lexington Public School Board of Education intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
City of Moore  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Moore City Council intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**



PLACE HOLDER  
For  
Moore Public School District  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Moore Board of Education intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
City of Noble  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Noble Council intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

**PLACE HOLDER**  
**For**  
**Noble Public School District**  
**Adoption Resolution**

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Noble Board of Education intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
City of Norman  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Norman City Council intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
Norman Public School District  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Norman Board of Education intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
University of Oklahoma  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Oklahoma Board of Regents intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

PLACE HOLDER  
For  
Town of Slaughterville  
Adoption Resolution

**Once the plan has been reviewed and deemed approvable pending adoption by Oklahoma Emergency Management and FEMA, the Town Council of Slaughterville intends to formally adopt the Cleveland County Hazard Mitigation Plan and provide an adoption resolution for approval.**

# CHAPTER ONE

## Plan Strategy

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### Introduction

Preventing the disaster-rebuild-disaster cycle is a major initiative of the Federal Emergency Management Agency (FEMA). Disasters cannot be controlled, but human activities can minimize damages. One of the goals of FEMA is to reduce or prevent potential damage from various natural disasters. FEMA has initiated programs to make investments in communities that will reduce the amount of money it takes for a community to recover from a disaster. This risk reduction is known as Hazard Mitigation and the process to achieve it is outlined in a Hazard Mitigation Plan.

A Hazard Mitigation Plan provides a systematic, objective review of a political jurisdiction and describes what steps can be taken to reduce a disaster's harmful effects. Among the benefits of maintaining a Hazard Mitigation Plan are:

- Ensures that hazard mitigation activities are coordinated with other community goals, preventing conflicts and reducing the costs of implementation.
- Ensures that all alternatives are evaluated so that problems are addressed by the most appropriate and effective solutions.
- Educates residents and other planning participants on existing hazard and protection measures.
- Justifies public and political support for projects.

The Plan is designed to fulfill the requirements of the following programs administered by the Federal Emergency Management Agency (FEMA):

- a. Pre-Disaster Mitigation Program (PDM),
- b. Flood Mitigation Assistance Program (FMA),
- c. Community Rating System Floodplain Management Planning (CRS)
- d. Post-disaster assistance through the Hazard Mitigation Grant Program (HMGP).
- e. Severe Repetitive Loss Program (SRL)
- f. Repetitive Flood Claims Program (RFC)

In the past, the **Robert T. Stafford Disaster Relief and Emergency Assistance Act** has provided funding for disaster relief, recovery, and some hazard mitigation planning. The Disaster Mitigation Act of 2000 (DMA 2000) has been updated to meet the growing concern and



needs of natural hazard mitigation. Due to more occurrences of disasters in the United States in recent years, including Oklahoma, the challenge to eliminate or reduce the effects of natural disaster on jurisdictions and their citizens falls primarily to the local jurisdictions to resolve the problem.

The escalating cost of emergency relief aid has prompted the Federal Emergency Management Agency (FEMA) to focus its priorities toward mitigation. This is a dramatic shift from FEMA's traditional charter of responding to disasters and being prepared to respond.

Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5165, enacted under the Disaster Mitigation Act (DMA) of 2000 (P.L. 106-390), provides new and revitalized approaches to mitigation planning. Section 322, in concert with other sections of the Act, provides:

- (b) Local and Tribal Plans - Each mitigation plan developed by a local or tribal government shall -
  - (1) Describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan; and
  - (2) Establish a strategy to implement those actions. A major requirement of the law is the development of local hazard mitigation plans.

Local mitigation plans must be reviewed, updated and submitted to the State Hazard Mitigation Division, and re-approved by FEMA every five years to remain eligible. This Mitigation Plan has been prepared to meet the requirements of the Act and the regulations established by FEMA. The commencement of this plan update was to update the original Cleveland County Hazard Mitigation Plan which was approved by FEMA on October 18, 2006. The Cleveland County Hazard Mitigation Planning Team (CCHMPT) worked to review the goals, objectives, strategies and mitigation projects identified in the 2006 plan in order to identify any changes which have taken place since October, 2006, as well as to identify and update new criteria for the next five years. The plan was revised to reflect any changes in priorities if identified during the planning process. The primary priorities of the goals and objectives have not changed; however, the mitigation actions to accomplish those priorities may have changed and, as such, are identified in Chapter Four: Mitigation Actions.

## Funding

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Funding for the Cleveland County Hazard Mitigation Plan was provided by a Hazard Mitigation Grant Program (HMGP) grant from FEMA, through the Oklahoma Department of Emergency Management (ODEM). Under the terms of the grant, the Federal Emergency Management Agency (FEMA) pays seventy-five percent of the cost of the grant; the local share of twenty-five percent was provided by Cleveland County, although the plan includes **Cleveland County and the unincorporated communities, the incorporated Cities of Lexington, Moore, Noble, Norman, and the Towns of Etowah and Slaughterville. Added to the plan in 2011 are the Public School Districts of Lexington Public School District; Little Axe Public School District; Moore Public School District; Noble Public School District; Norman Public School District; Robin Hill Public School District. Additionally the Moore Norman Technology Center and the University of Oklahoma** have joined as participants in the Cleveland County Hazard Mitigation Plan. All are located in Cleveland County.

In 2011, Cleveland County received the commitment for the federal grant from the Federal Emergency Management Agency (FEMA) to develop this Hazard Mitigation Plan. Subsequently, the Board of Commissioners of Cleveland County contracted with Hazard Mitigation Specialists, L.L.C., a hazard mitigation consulting firm, to help Cleveland County, the political jurisdictions, and public schools with this plan.

The following jurisdictions have had or currently have Capital Improvement project funding, the authority to levy taxes for specific purposes, charge fees for municipal services such as water, and sewer, Community Development Block Grants (CDBG), and various grants through the Oklahoma Water Resources Board (OWRB).

## Purposes of the Plan

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Cleveland County, located in central Oklahoma, experiences frequent natural hazards that cause damage to property and has the potential to adversely affect local citizens.

This Plan provides a framework on which to base comprehensive mitigation planning throughout the County. Hazard identification is the process that determines which hazards may threaten Cleveland County and its jurisdictions. Hazard Mitigation is the process of eliminating or

reducing the effects of natural disasters that may affect Cleveland County in the future largely driven by what has happened during the past five years.

This plan not only provides the framework and guidance for an all-hazard approach to mitigation, it identifies hazard mitigation goals, recommended actions and initiatives that will reduce or prevent injury and damage from natural hazards. This plan points out hazard problems and measures to be implemented or continued, to alleviate the suffering and damage caused by disasters within Cleveland County.

## Scope

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The scope of the Cleveland County Natural Hazard Mitigation Plan is county-wide. This plan is all-inclusive of natural hazards that may threaten Cleveland County residents or visitors. The following jurisdictions are included in the Cleveland County Multi-jurisdictional Natural Hazard Mitigation Plan: **Cleveland County and the unincorporated communities; the incorporated Cities of Lexington, Moore, Noble, Norman and the Towns of Etowah and Slaughterville. Added to the 2011 updated plan are the Lexington Public School District; Little Axe Public School District; Moore Public School District; Noble Public School District; Norman Public School District; Robin Hill Public School District. Additionally the Moore Norman Technology Center and the University of Oklahoma** have joined as participants in the Cleveland County Natural Hazard Mitigation Plan. It should be noted that part of Oklahoma City's city limits extend over into northern and western Cleveland County but are not covered in this plan. That area is part of the Oklahoma City hazard mitigation plan.

To be as effective and complete as possible, the Plan has also incorporated appropriate information from the State of Oklahoma Hazard Mitigation Plan approved by FEMA in 2011. The resources of the state through the Oklahoma Climatological Survey and Oklahoma Geological Survey were found to exceed local jurisdiction resources so they were also used.

With the benefit of this Plan, the county intends to lessen its vulnerability to disasters caused by natural hazards. These actions will shape the community into a more resilient framework, able to recuperate more quickly and easily when damage does occur.

## Community Mitigation Planning Goals

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In order to minimize the destruction and devastation resulting from disasters, Cleveland County has developed this Hazard Mitigation Plan to guide all levels of government, business, and the public. In addition to the general oversight of Pre-Disaster Mitigation that will be provided by Cleveland County Emergency Management and the County Commissioners, the Cleveland County Hazard Mitigation Planning Team (CCHMPT) will play a key role relative to general oversight, reviewing goals, objectives, and developing Pre-Disaster Mitigation implementation plans. The strategy of Cleveland County is to utilize the mitigation programs of the Federal Government to minimize the loss of life and property to the citizens of the county. Each natural hazard that is identified to apply to any portion of the county will be addressed and eliminated where possible through the implementation of the HMGP, PDM, SRL, FMA and RFC programs and grants. Additionally other grants from other sources will be utilized where possible to provide the best mitigation program possible. The approach of the strategy will be all-hazard as they relate to the county, with a specific focus on prioritizing and mitigating those hazards. This plan is intended to promote increased coordination among local officials and agencies from all levels of government and to integrate hazard mitigation management capabilities and programs. The primary goals and objectives of the Cleveland County Natural Hazard Mitigation Plan are to:

**Goal 1: Protect lives and property.**

**Goal 2: To improve or enhance emergency services.**

**Goal 3: To prevent or reduce the effects of natural hazards/disasters.**

**Goal 4: To identify and protect critical facilities in Cleveland County.**

**Goal 5: To develop or improve structures to become a more disaster resistant county.**

**Goal 6: To provide more public awareness of the natural disaster threat.**

## Plan Point of Contact

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**Primary:**

George Mauldin, Director  
Cleveland County Emergency Manager  
201 S Jones  
Norman, OK 73069  
Email: [gmauldin@cleveco14.org](mailto:gmauldin@cleveco14.org)  
Telephone: 405-366-0249

**Secondary:**

Rod Cleveland, District 1 Commissioner  
201 S. Jones  
Norman, OK 73069  
Email: [rcleveland@okco14.org](mailto:rcleveland@okco14.org)  
Telephone: 405-366-0200

## **Existing Plans, Programs and Capabilities**

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There are various local, state, and federal agency operational plans, along with private organizations discussed in the Cleveland County Hazard Mitigation Plan, which coordinate or interact with the Hazard Mitigation Plan. Below are the current plans the team will review and integrate, where appropriate actions and changes into the Cleveland County Hazard Mitigation Plan:

### **PLANS**

#### **CAPITAL IMPROVEMENT PLANS (CIP)**

Capital Improvement Plans help government determine priorities of the jurisdiction and determine possible funding resources. As the county and municipal Capital Improvement Plans for the communities listed are revised, an evaluation of mitigation actions identified in the Hazard Mitigation Plan will be conducted to determine what should be included in the Capital Improvement Plan. A review will also be done during the annual Hazard Mitigation Plan update. Noble does not currently have a plan; however, officials anticipate developing a plan in the next two years.

- Lexington
- Norman
- Norman Public Schools

#### **COMPREHENSIVE MASTER PLANS**

Comprehensive plans are general plans concerning the goals and objectives of the community in the vision, policies and strategies of the future. The Norman plan primarily encompasses land use planning and development. The plan in Noble does not address hazards or mitigation at this time.

- Lexington Public Schools
- Little Axe Public Schools
- Noble
- Noble Public Schools
- Moore
- Moore Public Schools (Crisis Management Plan)
- Norman
- Norman Public Schools
- Robin Hill Public Schools
- University of Oklahoma

#### **COMMUNITY WILDFIRE PROTECTION PLAN**

Helps a community clarify and refine its priorities for the protection of life, property, and critical infrastructure in the wildland–urban interface. It also can lead community members through valuable discussions regarding management options and implications for the surrounding watershed: Lexington

### **CONTINUITY OF OPERATIONS PLAN (COOP)**

The Basic Plan describes the actions that will be taken to implement a viable COOP capability within 12 hours of an event and to sustain that capability for up to 30 days. The Basic Plan can be implemented during duty and non-duty hours, both with and without warning.

Cleveland County. (Does not currently include mitigation)  
University of Oklahoma

### **DEBRIS MANAGEMENT PLAN**

A Debris Management Plan is a proactive approach to coordinating and managing debris removal operations as part of the overall emergency management planning efforts. Plan includes specifying debris dump sites or disposal methods, contractor research and consulting as well as determining debris collection policies and procedures.

Moore  
Norman

### **ECONOMIC DEVELOPMENT PLAN**

A comprehensive policy statement that summarizes the major economic issues affecting the community; establishes the community's goals for employment expansion, community development and economic strength; and identifies the means by which the community can actively reach these goals.

Lexington  
Norman

### **EMERGENCY OPERATIONS PLAN (EOP)**

The Emergency Operations Plans (EOP) coordinates responsibilities to designated departments, agencies, and volunteers in the event of a disaster. This plan provides information on the location of warning sirens and community shelters. It directs departments, agencies and volunteers in the procedures to best provide guidance, relief, and assistance to citizens from the effects of a disaster. This plan is written expressly for the welfare and safety of the people of Cleveland County. Most EOP's do not presently include mitigation projects nor be used to implement mitigation action projects

Cleveland County  
Lexington  
Lexington Public Schools  
Little Axe Public Schools (includes school vehicle)  
Moore  
Moore Public Schools  
Noble  
Noble Public Schools  
Norman  
Norman Public Schools  
Robin Hill Public Schools  
Slaughterville  
University of Oklahoma

### **STANDARD OPERATING PLANS (SOP)**

Each major department has a written operating guide that outlines day to day operations. The County Highway Districts, the Emergency Management and Sheriff's Departments have the most concentrated SOP's due to the nature of their operations. The departmental SOP's outline the operations and who is responsible for the various tasks during day to day operations. Each department affected by the Hazard Mitigation Plan will incorporate the goals and projects into their Standard Operation Plans in order to better carry out the goals established in the HM Plan.

Cleveland County  
Lexington  
Moore  
Noble  
Norman

### **STORM WATER MASTER PLAN**

The Storm Water Master Plan includes recommendations, new flood plain mapping, capital improvement projects, proposed water quality enhancements, drainage easement issues, and financing options. These plans generally include flood and flashflood hazards.

Noble  
Norman (Storm Water Phase II requirements; a Trails/Greenway Master Plan)  
Moore

### **TRANSPORTATION PLAN**

Transportation planning is involved with the evaluation, assessment, design and siting of transport facilities (generally streets, highways, bike lanes and public transport lines).

Little Axe Public Schools  
Norman (under development)  
University of Oklahoma

## **BUILDING CODES/PERMITTING/INSPECTION**

**BUILDING CODES**– Lexington (2009-International); Little Axe Public Schools; Noble (2009-IRC, 2009 IBC); Moore (International 2009); Norman (2006 and 2009 International); State adopted International Building Codes adopted by the local governmental entity, establishing minimum requirements that must be met in the construction and maintenance of buildings. Schools abide by city and state building requirements.

**Effectiveness:** Noble – 6  
Norman – 4  
University of Oklahoma

### **COUNTY RESOLUTIONS**

Codes and resolutions (counties in Oklahoma do not have ordinances) of the listed communities will be updated as appropriate; when policies and codes are changed, they will be reviewed for changes to the Hazard Mitigation Plan.

Cleveland County

**FIRE DEPARTMENT ISO RATINGS:**

Cleveland County - 9  
Lexington – 4  
Moore - 3  
Noble - 4  
Norman – 3 Urban; 9 Rural  
Slaughterville – 7

**SITE PLAN REVIEW REQUIREMENTS**

Lexington  
Moore  
Noble  
Norman  
Slaughterville

**LAND USE PLANNING AND ORDINANCES:**

Designation of allowable land use and intensities for a local jurisdiction. Noble maintains strict enforcement. Floodplain related are effective in reducing hazard impact of flooding.

**ZONING ORDINANCE** – Lexington; Moore; Noble; Norman; Slaughterville

**SUBDIVISION ORDINANCE** – Lexington; Moore; Noble; Norman; Slaughterville

**FLOODPLAIN ORDINANCE** – Cleveland County; Lexington; Moore; Noble; Norman; Slaughterville

**FLOOD INSURANCE RATE MAPS** – Cleveland County; Lexington; Moore; Noble; Norman; Slaughterville

**ACQUISITION OF LAND FOR OPEN SPACE AND PUBLIC RECREATION** – Moore; Norman;

**ADMINISTRATION**

**PLANNING COMMISSION**

Responsible for considering and investigating any subject matter relating to the development and improvement of the community and make recommendations to the governing body concerning those developments and improvements. Planning Commission members investigate and report on developments such as new streets, new structures (such as buildings, statues, memorials, parks, and bridges), and land (parcels, plats and re-plats). Members are also responsible for holding public hearings on any proposed changes in zoning.

Lexington  
Little Axe Public Schools; (city,county,school)  
Moore  
Noble  
Norman  
Slaughterville

**MITIGATION PLANNING COMMITTEE**

Has regular representation on Cleveland County Hazard Mitigation Planning Team

Cleveland County  
Etowah



Lexington  
Lexington Public Schools  
Little Axe Public Schools;  
Moore  
Moore Public Schools  
Noble  
Noble Public Schools  
Norman  
Norman Public Schools  
Slaughterville  
University of Oklahoma

#### **MAINTENANCE PROGRAMS**

Maintenance programs exist in each of the listed communities responsible for maintaining municipal and county properties and functions through specialized employees and departments. Maintenance occurs on an as needed basis.

Cleveland County  
Lexington  
Lexington Public Schools  
Little Axe Public Schools;  
Moore  
Moore Public Schools (buildings and grounds)  
Noble  
Noble Public Schools  
Norman  
University of Oklahoma

#### **MUTUAL AID AGREEMENT**

Local jurisdiction department personnel and equipment are protected in “requested” assistance situations through State Statute 63 O.S. Section 683. In addition, jurisdictional fire departments often have local Mutual Aid Agreements between specific jurisdictions.

Cleveland County  
Lexington  
Little Axe Public Schools;  
Moore  
Noble  
Norman  
Slaughterville (Fire Departments, County Commissioners, US Army)  
University of Oklahoma

### **STAFF**

The staffing in all participating jurisdictions is currently adequate and has been adequately trained to handle their responsibilities and enforcement as it applies to current regulations. They are also adequately trained and continue training in their fields of experience for hazard events that may affect their jurisdiction and are able to provide counsel and supervision of those potential projects to mitigate those hazards. They are also planning to enforce and to continue monitor the current regulations listed and keep them all updated as they relates to hazard mitigation.

Adequate to enforce regulations, generally trained on hazards and mitigation, coordination is effective

**CHIEF BUILDING OFFICIAL (FT)**– Lexington; Moore; Noble; Norman; Slaughterville

**FLOODPLAIN ADMINISTRATOR (FT)** – Cleveland County; Lexington; Moore; Noble; Norman; Slaughterville

**EMERGENCY MANAGER (FT)**– Cleveland County; Lexington, Moore; Noble; Norman; Slaughterville; University of Oklahoma

**COMMUNITY PLANNER (FT)** – Lexington; Moore; Noble; Norman;

**CIVIL ENGINEER (FT)** – Lexington; Moore (PT); Noble (PT); Norman; University of Oklahoma

**GIS COORDINATOR (FT)** – Moore; Norman; University of Oklahoma

**CODE ENFORCEMENT** - Slaughterville

**OTHER** – Moore Public Schools (Safety Director; 11 School Resource Officers)

## **TECHNICAL**

**Warning systems** – Lexington (outdoor public address); Lexington Public Schools (internal); Little Axe Public Schools (operated by City of Norman); Moore (dense outdoor warning system-mass notification – social media outlets); Noble (5 warning sirens); Norman (68 warning sirens-67 with voice capability); Noble Public Schools (internal); Norman Public Schools (internal); Moore Public Schools (mass calling/texting/email system; many campuses have Moore outdoor warning sirens located on them/tone alert radios; all Moore schools have NOAA weather radios); Robin Hill Public Schools; University of Oklahoma

**HAZARD DATA AND INFORMATION** – Moore (mapping); Moore Public Schools (Info for Gun Free School Act and campus surveys); Norman;

**GRANT WRITING** – Cleveland County; Lexington; Moore; Moore Public Schools; Noble; Norman; Norman Public Schools; Robin Hill Public Schools; Slaughterville; University of Oklahoma

**HAZARDOUS ANALYSIS** - University of Oklahoma

**OTHER** – Moore (WebEOC)

## **FINANCIAL**

Funding resource has been used in the past and could be used in the future unless noted below.

**CAPITAL IMPROVEMENT PROJECT FUNDING** – Lexington; Lexington Public Schools; Moore; Moore Public Schools; Noble (not used); Noble Public Schools; Norman (floodway land acquisition); Norman Public Schools; Robin Hill Public Schools

**AUTHORITY TO LEVY TAXES FOR SPECIFIC PURPOSES** – Cleveland County; Etowah (not used); Lexington; Moore (new Public Safety Center and 3 Fire Stations); Moore Public Schools; Noble (requires citizen approval); Norman; Slaughterville (limited)

**FEES FOR WATER, SEWER, GAS OR ELECTRIC SERVICES** – Lexington, Moore (gas/electric only); Noble; Norman;

**IMPACT FEES FOR NEW DEVELOPMENT** – Moore (not used); Noble; Norman;

**STORM WATER UTILITY FEES** – Noble (not used);

**INCUR DEBT THROUGH GENERAL OBLIGATION BONDS AND/OR SPECIAL TAX BONDS** – Cleveland County (jail); Lexington Public Schools; Little Axe Public Schools; Moore (assist in Public Service expansions); Moore Public Schools; Noble; Noble Public Schools; Norman; Norman Public Schools; Robin Hill Public Schools; Slaughterville

**COMMUNITY DEVELOPMENT BLOCK GRANTS** – Lexington; Moore (rebuilding water infrastructure critical for fire response); Noble; Norman;

**FEDERAL FUNDING PROGRAMS** – Cleveland County; Lexington; Moore (FEMA); Moore Public Schools (Homeland Security grants for school safety); Noble; Norman; Norman Public Schools; Robin Hill Public Schools; Slaughterville (Fire Act Grants)

**STATE FUNDING PROGRAMS** – Cleveland County; Lexington; Moore Public Schools (schools safety programs); Noble; Norman; Norman Public Schools; Robin Hill Public Schools; Slaughterville (REAP)

## **EDUCATION AND OUTREACH**

The public and school programs on safety through Fire Prevention, Home security, and generally the more common natural and technological hazards that might affect the community. Partnership initiatives addressing disaster related issues. Could help implement future mitigation activities.

**LOCAL CITIZEN GROUPS OR NON-PROFIT ORGANIZATIONS FOCUSED ON ENVIRONMENTAL, EMERGENCY PREPAREDNESS ACCESS AND FUNCTIONAL NEEDS POPULATIONS, ETC.** – Moore (EM Volunteers); Norman (Emergency Response Volunteers); Norman Public Schools; Robin Hill Public Schools University of Oklahoma

**ONGOING PUBLIC EDUCATION PROGRAMS** – Lexington, Lexington Public Schools; Little Axe Public Schools (Professional Days Training); Moore (EM, Fire, Police safety); Moore Public Schools (when requested by school staff); Noble (includes stormwater pollution awareness); Lexington Public Schools; Noble Public Schools; Norman; Norman Public Schools; Robin Hill Public Schools; Slaughterville (Fire Department); University of Oklahoma

**NATURAL DISASTER OR SAFETY SCHOOL PROGRAMS** – Lexington; Lexington Public Schools; Little Axe Public Schools (Professional Days Training); Moore Public Schools (Fire/Intruder/severe weather exercises on all campuses); Noble Public Schools; Norman (Police Adopt a school program); Norman Public Schools; Robin Hill Public Schools;

**Storm Ready Certification** – Moore; Norman; University of Oklahoma

**FIREWISE COMMUNITY CERTIFICATION** – Norman (Ready Set Go program);

**PUBLIC AND PRIVATE PARTNERSHIPS** –

Lexington- (Hamm Trucking and public schools).

Norman- (Community Outreach and Preparedness)

## **Community Profile - Cleveland County**

Located in central Oklahoma, Cleveland County is bounded by Oklahoma County on the north; Pottawatomie County on the east; McClain County on the south and west; and Canadian County to the northwest. The South Canadian River defines the southern boundary of Cleveland County. The county lies in the Red Bed Plains



physiographic region except for the southern corner, which is situated in the Sandstone Hills. The county's total land and water area of 558.34 square miles is drained by the Little River and the Canadian River. The County is named for former President Grover Cleveland.

### **History of Cleveland County**

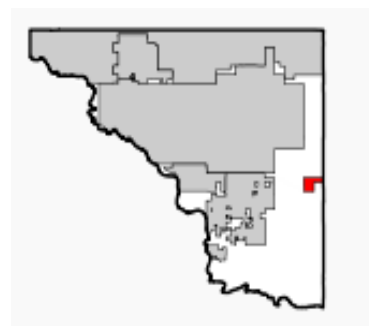
Spanish and French explorers and traders were the first Europeans in present Oklahoma, because Spain and France were vying for control of North America between Canada and Mexico. In 1740 French Canadian traders and brothers Pierre Antoine and Paul Mallet traveled east along the Canadian River on their return trip from New Mexico while searching for a trade route to connect Santa Fe with Missouri and New Orleans. After the 1803 Louisiana Purchase, including present Oklahoma, between the 1820s and 1850s American explorers, traders, and military passed through the region. Those who followed the Canadian River across present Cleveland County included the Long-Bell Expedition, the Dodge-Leavenworth Expedition, Nathan Boone, and Josiah Gregg. In 1835 near present Lexington Maj. Richard Mason negotiated peace between the Plains tribes, the Osage, and the Five Civilized Nations at Camp Mason or New Camp Holmes. The site was abandoned in August 1835.

In 1818 the Quapaw ceded the area south of the Arkansas and Canadian rivers in present Oklahoma. During the late 1820s and the 1830s the Creek and Seminole were removed from the southeastern part of the United States to the ceded area. In 1856 an agreement between the two tribes created a Seminole Nation with separate land for them west of the Creek Nation. During the Civil War the Seminole and Creek supported the Confederacy and as a result lost land in the Reconstruction Treaty of 1866. This left an area that became known as the Unassigned Lands, which would be opened to non-Indian settlers on April 22, 1889. Prior to that the Kansas Southern Railway (sold to Atchison, Topeka and Santa Fe Railway on February 15, 1899) constructed a line from the Kansas-Oklahoma border to Purcell located in McClain County. Cleveland County's principal towns were founded along this railroad line.

After the passage of the Organic Act on May 2, 1890, Cleveland County was organized as County Three. Norman was selected as the county seat. In 1891, following the Sac and Fox Opening, a strip of land six miles wide and thirty-one miles long was added to the eastern part of Cleveland County. For a short time Cleveland County was also known as Little River County. At an election on August 5, 1890, the majority of the voters selected Cleveland (in honor of President Grover Cleveland) over the other choice of Lincoln. Initially, county officials rented space until 1893, when they moved to a two-story, brick building. That building burned in February 1904, and a new courthouse was completed in 1906. The present courthouse was constructed in 1939 and has had additions built in 1979 and 1980.

### **Community Profile - Town of Etowah**

Etowah is located on Etowah Road eleven miles east of Noble. Oklahoma Historian George Shirk noted that the town name was derived from a Cherokee settlement in Georgia. In the nineteenth century the area where the town developed stood in the Unassigned Lands. This region opened to general settlement with



the 1889 Land Run. The rural community of Etowah soon emerged on the road connecting Purcell to Tecumseh.

### **History of Town of Etowah**

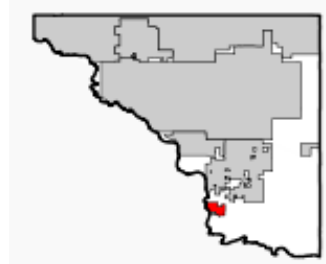
In 1894 the U.S. Post Office Department designated an Etowah post office. In 1898 the town had one business, and a general merchandise store. In 1899 the local school had forty students. In 1907 the community lost its post office, when the area received free rural delivery from the Noble office. By 1911 Etowah had two general stores, a blacksmith, and a cotton oil mill. For most of the twentieth century it remained a small, dispersed rural community. In the 1930s the village initiated a homecoming or town reunion, which continued into the twenty-first century.

In 1967 residents petitioned the Cleveland County commissioners to incorporate. The commissioners approved and ordered an election, which never occurred. Community leaders formed a municipal government and operated as a town, but the incorporation was not officially finalized. In 1983 the town trustees enacted zoning ordinances that led to a number of residents questioning the legal status of Etowah. That year a district judge ruled the town incorporated, citing that it operated as a municipality for almost twenty years without being questioned.

### **Community Profile - City of Lexington**



**Lexington:** Lexington lies two and one-half miles from the Canadian River on State Highway 39.



#### **History of Lexington**

In 1835, north of the present town, Maj. Richard B. Mason established Camp Holmes, where many of the Plains Indian tribes and members of the Five Civilized Tribes, along with the Osage, signed the Treaty of Camp Holmes on August 25, 1835.

Subsequently, a trading post was built at the site, called Camp Mason. The area stood within the Unassigned Lands prior to its opening with the Land Run of 1889. Several entrepreneurs planned Lexington prior to the run, filing the necessary legal papers on the eventful day. The town name emanates from Lexington, Kentucky.

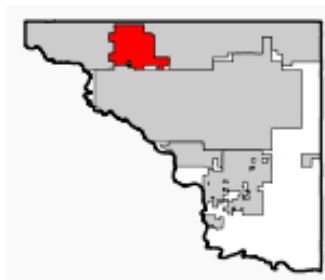
The U.S. Post Office Department designated a Lexington post office on February 21, 1890. The community could not support its municipal government and assessed a high tax on liquor sales, which caused infighting and a loss of incorporation. After a compromise, the town reincorporated in 1892. Saloons dominated the town's business landscape from its founding until 1907 statehood, when intoxicating liquor was prohibited. The village stood as a "whiskey town" on the border of Indian Territory.

In 1898 five saloons, seven general stores, eight doctors, a veterinarian, a broom factory, three blacksmiths, a harness and saddle maker, a hotel, a newspaper, and other retail outlets served the town. Surrounding fruit orchards benefitted the local economy. The Glenwood Fruit Farm

soon became the eminent producer. Cotton and corn were also early agricultural mainstays. By 1908 the community supported two banks.

During World War II the U.S. Navy constructed a gunnery school east of Lexington. After the war the state acquired the campus and located an annex to the Central State Mental Hospital (later Griffin Memorial Hospital) there. In 1971 the Oklahoma Department of Mental Health closed the facility and gave the land to the Department of Corrections. A minimum-security prison, named the Regional Treatment Center, opened soon after. In 1976 the state began construction on the Lexington Assessment and Reception Center (LARC). The center processes all prisoners sentenced to Oklahoma's prison system. It also houses medium and minimum-security facilities. In 1978 the Regional Treatment Center, which was separate from the LARC, became the Joseph Harp Correctional Center, a medium security prison.

## Community Profile - City of Moore



Moore is surrounded on three sides by Oklahoma City and on the fourth by Norman. Moore is on State Highway 37, with Interstate 35 and U.S. Highway 77 running through its city limits.

### History of Moore

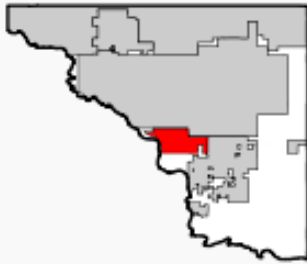
In 1886-87 the Southern Kansas Railway (a working subsidiary of the Atchison, Topeka and Santa Fe Railway which bought it outright in 1899) laid track through the area, positioned in the Unassigned Lands prior to the Land Run of 1889. At the present townsite the railway located a watering stop, which they named Verbeck. Reportedly, railroad employee Al Moore lived in a boxcar there, accounting for the later name. The community received a postal designation in May 1889.

When it incorporated in 1893, the town had a hotel, a livery, three general merchandise stores, a saloon, a restaurant, a lumber company, a carriage, plow, and wagon works, and a grocery. Two doctors served the village. In 1894 the Cleveland County Courier began operation. In 1910 the Oklahoma Railway Company constructed an interurban line from Oklahoma City to Moore. By 1911 a bank, a blacksmith, a milling and Grain Company, a cotton oil company, a livery, a hardware store, a drugstore, two doctors, a creamery, and four general stores served the community.

Moore remained rural, benefitting area ranchers and farmers through the mid-twentieth century. By 1946 the community maintained a bank, a cotton gin, a grain elevator, a lumber company, and several retail outlets. Between 1960, when the population was 1,783, and 1970, with a population of 18,761, the town was one of Oklahoma's fastest growing cities. This growth led to expansion of city services and an inflow of retail and manufacturing businesses. In 1963 a second bank received its charter. In 1971 the Moore Municipal Hospital opened. The town called itself the "minute city" because of its proximity to Midwest City's Tinker Air Force Base, Oklahoma City's General Motors Assembly Plant and Mike Monroney Aeronautical Center, and Norman's York International Plant and the University of Oklahoma. These employment hubs attracted a large number of residents. At the beginning of the twenty-first century the public school system (with over two thousand employees), Convergys Corporation, Wal-Mart, Cendant Corporation, and Vaughn Foods were the leading employers.

The town's residents and visitors now enjoy numerous amenities, including a library, eight city parks, a community center, a community pool, several golf courses, and four hotels. In 2005, the Moore Medical Center, a forty-five-bed hospital opened replacing the old hospital, which closed in 1993.

## Community Profile - City of Noble



**Noble:** Noble is positioned on U.S. Highway 77 near the east bank of the Canadian River approximately six miles south of Norman.

### **History of Noble**

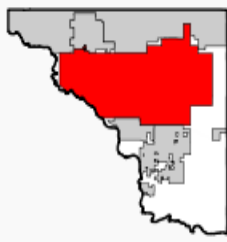
Prior to the Land Run of 1889, the area stood in the Unassigned Lands. Albert Rennie planned the town, claiming the 160-acre town site during the run and convincing the Southern Kansas Railway (sold to the Atchison, Topeka and Santa Fe Railway in 1899), to locate a station there. Rennie named the town Noble to honor U.S. Secretary of the Interior John W. Noble. The community had hoped to gain the county seat, but the Norman town site attracted more businesses. In July 1889 the Post Office Department designated a Noble post office. In January 1891 the town site was surveyed and platted.

By August 1890 the town had a lumber company, a butcher, a livery, a grocer, two blacksmiths, a druggist, a hardware store, a hotel, two general stores, three doctors, and a newspaper, the *Noble Democrat*. Soon after the village was established, a cotton gin served the area farmers. In 1898 the Oklahoma College Experiment Station built and installed a cattle-dipping vat at the town to bathe cattle entering Oklahoma Territory. This helped prevent the spread of Texas fever. In 1898 Canadian River Bridge Company built a suspension bridge over the South Canadian River. The flooding river destroyed the bridge in 1903 or 1904. In 1902 the bank received its charter, and by 1911 a jeweler and a feed mill also served the town.

By 1946 the bank had successfully survived the Great Depression, and several retail outlets, a feed mill, the nursery, and the Smith Brothers Road Contractors, established in 1918, operated in the town. The town, with 2,241 residents in 1970, became a "bedroom" community for Norman and Oklahoma City. More businesses emerged. In 1979 Award Design Medals, Inc., opened and was the largest employer for several years. The company manufactured specialty belt buckles (often for the rodeo circuits), medallions, and figurines before closing in 2001. In 1970 the Brockhaus Nursery purchased Garee's Noble Nursery. In the 1980s Noble continued to prosper, adding seven businesses in 1982. In 1992 the Thunder Valley Raceway Park opened, providing drag racing entertainment.

In 1984 Gov. George Nigh designated Noble the "Rose Rock Capital." Rose rock (barite rosette) is a rare rock that can be found in central Oklahoma, Kansas, California, and Egypt. Annually in May Noble hosts the Rose Rock Festival, and in 1986 a rose rock museum was established.

## Community Profile - City of Norman



**Norman:** Norman is located approximately nineteen miles south of the State Capital located in Oklahoma City. Its north boundary is shared by Oklahoma City and Moore. State Highway 9, U.S. Highway 77, and Interstate 35 run through the community. In the 1990s Norman became Oklahoma's third largest city, behind Oklahoma City and Tulsa.

## **History of Norman**

The town name honors Abner E. Norman, who led a team appointed to survey the Unassigned Lands between 1870 and 1873. His group camped where the town is now situated, and the words "Norman's Camp" were burned into a tree. In 1886-87 the Southern Kansas Railway (a subsidiary of the Atchison, Topeka and Santa Fe Railway) laid tracks through the area and established station grounds at the present townsite.

As the 1889 Land Run approached, entrepreneurs formed the Norman Townsite Company to organize the town. The group had developed a plat before the event, but used the survey prepared by the railroad company. By 1890 the population stood at 787, and the burgeoning town held doctors, lawyers, hotels, and all the amenities and retail outlets of a community that size, including a cotton gin. In 1890 High Gate College opened, offering grammar, high school, and college classes. In December 1890 the Territorial Legislature passed an act to locate the University of Oklahoma (OU) at Norman. In 1892 OU held its first classes in rented downtown buildings. In 1893 workers completed the first university building, which fire later destroyed. In 1894 High Gate closed, and its college students transferred to OU. A private sanitarium company purchased the college building, and it evolved into the Oklahoma State Asylum in 1915 (later Griffin Memorial Hospital).

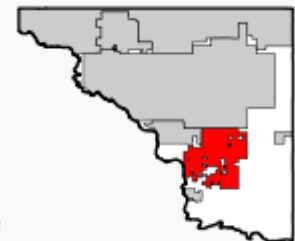
The business community boomed. By 1902 the downtown district contained two banks, two hotels, and a flour mill, among other businesses. In 1913 the Oklahoma Railway Company extended their interurban that ran from Oklahoma City to Moore, south to Norman. By the 1920s the OU campus spread over 267 acres and had added several new structures, including Memorial Stadium. The sanitarium and university helped the community weather the Great Depression. In 1939 the Cleveland County courthouse replaced a 1906 government building.

World War II brought more changes to the city. In 1941 OU, with help from Norman officials, established Max Westheimer Field, a university airstrip, and the next year offered to lease it to the U.S. Navy as a training facility. During the war the airfield became the Naval Flight Training Center, known as north base, and the navy established the Naval Air Technical Training Center (NATTC), known as south base, south of the OU campus. A naval hospital was also established. The north base trained nearly nine thousand men, with the south base training thousands more. In 1946 the navy donated the bases to the university, but in 1952, with the advent of the Korean War, the military utilized the bases in a smaller capacity until 1959. The addition of the government buildings and land helped OU handle the large enrollment increase of the post-World War II era. This also allowed the city to develop, and the 1950 population stood at 27,006.

Norman's proximity and easy access to Oklahoma City contributed to it being a "bedroom" community for employees who worked outside Norman proper. In the 1960s the city, through annexations, expanded to 174 square miles, incorporating a large land area in the Lake Thunderbird vicinity. In 1984 the community supported sixty-three manufacturing establishments, which employed 2,562.

## **Community Profile - Town of Slaughterville**

**Slaughterville:** Slaughterville lies along State Highway 77, five miles south of Noble. The name honors Jim Slaughter, who operated an area store.





## **History of Slaughterville**

The Land Run of 1889 opened the region to its first general settlement. Before then the present townsite was in the Unassigned Lands. In 1889 settlers erected the first of three buildings, which housed the Shiloh Methodist Church, one-half mile north of present Slaughterville. Through most of the twentieth century the town existed as a dispersed rural district, with a service station/dry goods store on U.S. Highway 77 serving farmers and ranchers.

In 1970 the crossroads town incorporated to stave off perceived annexation threats from Norman, Noble, and Lexington. Soon, a fire department organized. The original town limits, approximately twenty-seven square miles in the 1970s, decreased in 1985, when the town's trustees de-annexed nearly 40 percent of the land. By 2000 the town area had increased to 38.108 square miles. A majority of the residents commuted to larger towns to work. The children attended school at either Lexington or Noble.

## **Population**

**Cleveland County** - At 1907 statehood Cleveland County had a population of 18,460. Growth was slow during the next two decades with 18,843 and 19,389 reported in 1910 and 1920, respectively. Numbers have continually increased from 24,948 in 1930. The federal census indicated 41,443 in 1950. By 1980 the numbers almost doubled at 81,839. In 2000 Cleveland County had 208,016 residents. The 2010 census shows the county census at 255,755. Cleveland County is a prosperous, growing county and is anticipated to continue this growth.

**Etowah** - In 1911 Etowah's estimated population stood at seventy-five residents, in 1980 the population was twenty-eight, and it added five residents in 1990. The 2000 population stood at 122, with most workers commuting to larger cities. The 2010 census showed the population to be 92 residents.

**Lexington** - In 1890 Lexington's population stood at 223, and it increased to 861 in 1900. The population was 950 in 1920 and 836 in 1930. In 1950 Lexington had 1,176 residents. That number climbed from 1,516 in 1970 to 1,731 in 1980. In 2000 the town had 2,086 residents. In 2010 the census counts for Lexington was at 2152.

**Moore** - At 1907 statehood Cleveland County had a population of 18,460. The 2010 census shows the county census at 255,755. Communities in Cleveland County constitute the largest segment of the population in the county. Moore's 1900 the population stood at 129, climbing to 225 in 1910. In 1930 the population was 538, but declined to 499 in 1940 as did many of the other communities in pre- WWII Oklahoma. By 1950 the Moore population was only 942. By 1980 however the population had mushroomed to 35,063, and it has continued to grow, standing at 40,318 in 1990 and 41,138 in the 2000 census. The 2010 census shows the population of Moore had grown to 55,081.

**Noble** - In 1900 the population stood at 349, climbing to 403 in 1910. In 1920 the population was 497, which declined to 463 in 1930, but rebounded to 536 in 1940. The population began a steady ascent, reaching 724 in 1950 and 995 in 1960. As the 1970s approached the population boomed. The 1980 population stood at 3,497 and climbed to 4,710 in 1990. In 2000 the community's population stood at 5,260 growing to 6,481 citizens.

**Norman** - By 1900 Norman's population had climbed to 2,225. . In 1910 there were 3,724 residents, and the number climbed to 5,004 in 1920. Throughout the 1920's the population continued to rise, reaching 9,603 in 1930 and 11,429 in 1940. The population increased from 33,412 in 1960 to 52,117 in 1970. The population stood at 68,020 in 1980 and climbed to 80,071 in 1990. By 2000 the population stood at 95,694. The 2010 Census showed Norman's population had grown to 110,925.

**Slaughterville** - There were 1,953 residents in 1980 and 1,843 in 1990. In 2000, the population stood at 3,609 and the 2010 census showed the population of 4,137.

## Government

### COUNTY GOVERNMENT

**Cleveland County** government generally performs state mandated duties which include assessment of property, record keeping (e.g., property and vital statistics). Other major programs performed by the county are the maintenance of rural roads, administration of elections, county law enforcement/jail administration, judicial functions, and relief for the poor. Today counties are also rapidly moving into other public services such as undertaking programs relating to child welfare, consumer protection, economic development, employment training, planning and zoning, and water quality, to name a few.

Counties are a subdivision of state government. The powers it exercises are primarily delegated by the State as a quasi-municipal corporation. Cleveland County, like most counties, considers the construction and maintenance of county roads one of their primary programs.

Each County is divided into three districts, as equal in population as possible and numbered 1, 2, and 3 respectively. One Commissioner is elected from each district. District boundaries are set every 10 years following the federal census. Oklahoma County Commissioners are required to fulfill the needs of their district with taxpayer funds provided, each year, in a Highway Cash Account and a Highway Levy Account. A County Commissioner is a Constitutional Officer, who must fulfill his or her Constitutional and Statutory duties.

All of the county officials are elected to staggered four year terms except for the Election Board Secretary who is appointed by the local state senator. Counties are made up of the following elected officials:

- District 1, 2, and 3 County Commissioners
- County Clerk - Functions as the custodian of records for the county, acts as registrar of deeds, and acts as the county's purchasing agent.
- County Court Clerk - Maintains all proceedings of the Court of Record in the county.

- County Assessor - Have the duty and responsibility to determine the true worth of real and personal property for the purpose of taxation.
- County Treasurer - Acts as the tax collector and banker for the county.
- County Sheriff - Preserves the peace and protects life and property and suppress' all unlawful disturbances.

## Oklahoma Statutes Citationized

### Title 19. Counties and County Officers

#### Chapter 1 - Status and Power of Counties

#### Section 3 - County's Powers Exercised by Board of Commissioners - Certain Contracts Void by Individual Commissioner

Cite as: O.S. §, \_\_\_

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The powers of a county as a body politic and corporate shall be exercised by its board of county commissioners.

It is hereby declared to be contrary to law, and against public policy, for any individual county commissioner, or commissioners, when not acting as a board, to enter into any contract, or to attempt to enter into any contract, as to any of the following matters:

- (a) Any purchase of equipment, machinery, supplies or materials of any kind for any county or any commissioner's district, or districts, thereof;
- (b) Any contract or agreement relating to or for the leasing or rental of any equipment, machinery, supplies or materials for any county or any commissioner's district, or districts, thereof;
- (c) To do or transact any business relating to such county, or any commissioner's district, or districts thereof, or to make any contract or agreement of any kind relating to the business of such county, or any commissioner's district, or districts thereof;

And none of such acts or attempted contracts as above set forth, done or attempted to be done, by an individual county commissioner or commissioners, when not acting as a board, shall ever be subject to ratification by the board of county commissioners, but shall be illegal, unlawful and wholly void.

Provided that nothing herein shall be construed as prohibiting or preventing the chairman of the board of county commissioners from performing such duty or duties as he may be required by law to perform as chairman of such board, but only after the board, by a majority vote thereof, shall have authorized and directed such performance by said chairman.

## MUNICIPAL GOVERNMENT

A **municipality** is used to mean the governing body of a municipality. A municipality is a general-purpose administrative subdivision, as opposed to a special-purpose district. In Oklahoma there are several forms of government within municipal government. The forms of government for each jurisdiction are identified following:

Under Oklahoma law, municipalities are divided into two categories: cities, defined as having more than 1,000 residents, and towns, with under 1,000 residents. Both have legislative, judicial, and public power within their boundaries, but cities can choose between a mayor-council, council-manager, or strong mayor form of government, while towns operate through an elected officer system.

### Oklahoma Statutes Citationized

#### Title 11. Cities and Towns

#### Chapter 1 - Oklahoma Municipal Code

#### Article I - General Provisions and Definitions

1. "Charter municipality" or "Municipality governed by charter" means any municipality which has adopted a charter in accordance with the provisions of the Constitution and laws of Oklahoma and at the time of adoption of the charter had a population of two thousand (2,000) or more. Once a municipal charter has been adopted and approved, it becomes the organic law of the municipality in all matters pertaining to the local government of the municipality and prevails over state law on matters relating to purely municipal concerns;

2. "City" means a municipality which has incorporated as a city in accordance with the laws of this state;

13. "Town" means a municipality which has incorporated as a town in accordance with the laws of Oklahoma.

#### **Section 22-101 - Corporate Powers of Municipalities**

*All incorporated municipalities shall be bodies corporate and politic, and shall have the powers to:*

1. Sue and be sued;
2. Purchase and hold real and personal property for the use of the municipality;
3. Sell and convey any real or personal property owned by the municipality and make orders respecting the same as may be conducive to the best interests of the municipality;
4. Make all contracts and do all other acts in relation to the property and affairs of the municipality, necessary to the good government of the municipality, and to the exercise of its corporate and administrative powers; and
5. Exercise such other powers as are or may be conferred by law.

## Statutory Town Board of Trustees

### **Oklahoma Statutes Citationized**

#### **📁 Title 11. Cities and Towns**

#### **📁 Chapter 1 - Oklahoma Municipal Code**

#### **📁 Article XII - Statutory Town Board of Trustees Form of Government**

#### **📄 Section 12-102 - Governing Body - Board of Trustees**

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The town board of trustees shall consist of either three (3) or five (5) trustees who shall be nominated from wards or at large and elected at large. The governing body may submit to the voters the question of whether the town board shall consist of either three (3) or five (5) trustees. If approved, the election of trustees to fill any new positions shall take place at the time set by the town board but no later than the next regular municipal election. The terms of the new trustees shall be staggered as provided for in Sections 16-205 and 16-206 of this title.

### **The Town of Etowah**

### **The Town of Slaughterville**

Towns governed under the statutory town board of trustees form have all the powers, functions, rights, privileges, franchises and immunities granted, or which may be granted, to towns. Such powers shall be exercised as provided by law applicable to towns under the town board of trustees form, or if the manner is not thus prescribed, then in such manner as the board of trustees may prescribe. Slaughterville has an Administrator/Town Clerk who works under the direction of the Board of Trustees and is responsible for the daily operation of the Town. The Administrator also works closely with citizens and other agencies to see that ordinances and services are properly administered.

## **Statutory Council-Manager**

### **Oklahoma Statutes Citationized**

#### **Title 11. Cities and Towns**

#### **Chapter 1 - Oklahoma Municipal Code**

#### **Article X - Council-Manager Form of City Government**

#### **Section 10-101 - Statutory Council-Manager Form of Government**

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The form of government provided by Sections 11-10-101 through 11-10-121 of this title shall be known as the statutory council-manager form of city government. Cities governed under the statutory council-manager form shall have all the powers, functions, rights, privileges, franchises and immunities granted, or which may be granted, to cities. Such powers shall be exercised as provided by law applicable to cities under the statutory council-manager form, or if the manner is not thus prescribed, then in such manner as the council may prescribe.

In a Council-Manager form of government the City Council consists of a Mayor, who is elected at-large, with an appropriate number of elected council members, to serve the political wards (districts) in the City. He has no regular administrative duties other than in signing written obligations of the City as the Council may require.

The City Manager is the chief executive administrative officer for the community and is appointed by and reports directly to the City Council. The City Manager supervises all of the city's departments, prepares the annual budget, and performs such activities as directed by the council. Lastly, the city manager has the power to appoint, and when necessary for the good of the service, remove, demote, lay off or suspend all heads of administrative departments and other administrative officers and employees of the city except as otherwise provided by law.

## **Climate**

Cleveland County is part of the Central Great Plains in the far western regions of the county and transitions to Crosstimbers over most of the county. Average annual precipitation ranges from about 36 inches in western Cleveland County to nearly 40 inches in the east. May and September are the wettest months, on average, but much of the spring through fall receives sufficient rainfall. Nearly every winter has at least one inch of snow, with one year in three having ten or more inches.

Temperatures average near 61 degrees, with a slight increase from north to south. Temperatures range from an average daytime high of 94 degrees in July to an average low of 28 degrees in January. Cleveland County averages a growing season of 209 days, but plants that can withstand short periods of colder temperatures may have an additional three to six weeks.

Winds from the south to southeast are quite dominant, averaging near ten miles-per-hour. Relative humidity, on average, ranges from 45% to 88% during the day. During the year, humidity is highest in May and lowest in August. Winter months tend to be cloudier than summer months. The percentage of possible sunshine ranges from an average of about 55% in winter to nearly 80% in summer.

Thunderstorms occur on about 49 days each year, predominantly in the spring and summer. During the period 1950 - 2011, Cleveland County recorded 65 tornadoes. On occasion, hurricanes affect Cleveland County. As they move onto land they weaken and become Tropical Storms. As they move further inland, they tend to lose strength and move slower, resulting in unusually large quantities of rain over the area. With Cleveland County's relatively flat topography, these storms still create a significant flooding threat.

## **Economics and Transportation**

Cleveland County is the eighth largest Oklahoma County in area; it has the third largest population and two of the state's seven largest cities, Norman and Moore. Additional agriculture, manufacturing and other industries have boosted the economy since the early 1900's. Moore Medical Center, Norman Regional Hospital, Griffin Memorial Hospital, and Oklahoma Veterans Center offer numerous health care jobs. Major employers within the county include York International, U.S. Postal Training Center, Wal-Mart Stores, Sysco Food Services, Hitachi Computer Products, Saxon Publishers, Lowes Home Improvement, Home Depot Home Improvement, and Yamanouchi Pharma Technologies.

Motorists and commercial transports have use of two Interstate highways and three state highways to get to their destinations all over the country as well as numerous miles of county roads.

### **Major highways**

-  Interstate 35
-  Interstate 44/U.S. Highway 62
-  State Highway 9
-  State Highway 37
-  State Highway 39

Interstate 35 traverses Cleveland County and offers easy access and a convenient transportation corridor to the junction of I-40 and I-44, just to the north. Cleveland County offers a diverse mix of industry, including agribusiness, the equine industry, energy, manufacturing and distribution, research and development and retail trade and tourism. Education and research opportunities abound at the University of Oklahoma campus (enrollment 20,000) and over a dozen colleges and universities that are within a 45 minute drive.

Inter-city passenger train service is available via Amtrak at Norman's Depot. Amtrak's Heartland Flyer provides daily round trip service to downtown Oklahoma City and Fort Worth, Texas.

Moore-Norman Technology Center provides the nation's premier business and industry training program. The towns in the county provide a business friendly atmosphere designed to encourage economic development.

**Lexington** is home to two correctional centers; the Lexington Assessment and Reception Center, and the Joseph Harp Correctional Center.



**Lexington Assessment and Reception Center**

The Lexington Assessment and Reception Center complex is composed of three units:

1. The Lexington Assessment and Reception Center is a special purpose maximum security unit that receives persons sentenced to prison by the courts. During the reception period of approximately ten to thirty days staff determine which DOC facility assignment is most appropriate for each inmate. Security and operations support is provided by the prison, with additional staff working in classification and health services supplied by the Operations division. The additional staffing is listed above, with the prison staffing listed separately under the correctional center side. The reception process operates under the direction of the administrator of Population Management.
2. The Lexington Correctional Center is a medium security prison. Its count and funding is listed separately and it is administered by the warden of the facility.
3. The Rex Thompson Minimum Security Unit staffing and budget are included under the correctional center side, with a separate table to show the inmate profile at the unit. This unit is also administered by the warden.

Lexington is also home to the Joseph Harp Correctional Center.





### **Joseph Harp Correctional Center**

Joseph Harp Correctional Center is named in honor and memory of Warden Joseph Harp who served as warden at the Oklahoma State Reformatory from 1949 to 1969. Warden Joseph Harp was clearly an innovative leader and professional in the field of corrections.

Under Warden Harp, Oklahoma State Reformatory was the first institution to establish a fully accredited academic High School behind prison walls. Warden Harp recognized that one of the greatest needs that many inmates of his time (as well as today) had was a high school education. As early as 1950, Warden Harp proposed in a legislative report the need for: a Department of Corrections; a merit system of employment; a statewide probation system staffed with competent officers who would make pre-sentence investigations; a reception center for all felons coming into the prison system; and a full time pardon and parole board.

In **Moore**, the seventh largest city in Oklahoma, new industrial prospects appear frequently, significant commercial growth is occurring along the Interstate 35 corridor, and the new residential developments include larger, executive-type housing and gated communities. With this growth the city is hard at work improving our public safety departments with the temporary half-cent public safety sales tax approved by voters in 2006. The funds from the public safety tax are being used to purchase new equipment for our fire and police, as well as the construction of new fire stations and a new Police/Emergency Management Center in Old Town. Moore is also constructing several street projects approved by voters in November 2008.

Norman, the third largest city in Oklahoma is home to the Norman Regional Hospital, Griffin Memorial Hospital, and Oklahoma Veterans Center. Other major employers in Norman include York International, U.S. Postal Training Center, Sysco Food Services, Hitachi Computer Products, Saxon Publishers, and Yamanouchi Pharma Technologies.

Norman is served locally by Max Westheimer Airport, a general aviation airport run by the University of Oklahoma. The airport is one of only two airports in the Oklahoma City metropolitan area designated as a reliever airport to Will Rogers World Airport. Max Westheimer Airport is capable of handling aircraft up through and including executive class jet aircraft.

The Cleveland Area Rapid Transit (CART), operated by the University of Oklahoma, provides bus service throughout the 191-square-mile (490 km<sup>2</sup>) Norman area. Metro Transit maintains a fleet of buses and trolleys serving the greater Oklahoma City area, including Will Rogers World Airport.



In 2008, CART became the 39th public transportation system in the United States to be featured on Google Transit, a website that allows transportation users to electronically plan their travel routes. In 2010, CART buses were modified to include a GPS tracking system that allows riders to see the location of buses and their predicted arrival times via the CART and Google websites. CART buses transport more than 1.3 million travelers annually.

Inter-city passenger train service is available via Amtrak at Norman's Depot. Amtrak's *Heartland Flyer* provides daily round trip service to downtown Oklahoma City and Fort Worth, Texas.



Although Norman currently has no light rail or commuter rail service, there is growing interest in incorporating such services into the city's future transportation plans.

The predominant form of transportation in Norman is roads and highways with 80.0% of all residents driving alone to work, 9.0% carpooling, and just 1.3% taking public transportation. As of 2007, Interstate 35 alone was handling over 99,000 vehicles per day. Other major highways include U.S. Highway 77, which serves more than 25,000 vehicles per day and State Highway 9, a portion of which serves 28,000 vehicles per day. Highway 9 is a major east–west highway in Oklahoma. Spanning across the central part of the state, SH-9 begins at the Texas state line near Madge, OK and ends at the Arkansas state line near Fort Smith, Arkansas. At 348.1 miles (560.2 km), SH-9 is Oklahoma's second-longest state highway (second to State Highway 3). The Norman area is also served by State Highway 77H.



## Academia

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Early settlers focused on establishing educational facilities. Residents could receive higher education in Norman at High Gate College, opened in 1890, and the University of Oklahoma, opened in 1892. In Noble the Noble Academy operated from 1891 to 1895. In 1908 Cleveland County children were served by eighty-six common schools and two high schools. Among African American schools were the Stella School District, West Point School District, and Norris School District in the northeastern corner of the county. At least three schools for African Americans, Banner School District, Rose Hill School District, and McIntosh School District, existed east of Lexington. By 1930 the county had sixty-four one- and two-room school houses, and Norman, Moore, Noble, and Lexington had high schools. The private, nonprofit Hillsdale Free Will Baptist College, located in Moore, opened in the late 1960s. Since 1972, the Moore-Norman Technology Center has offered programs in business administration, computer technology, and health careers.

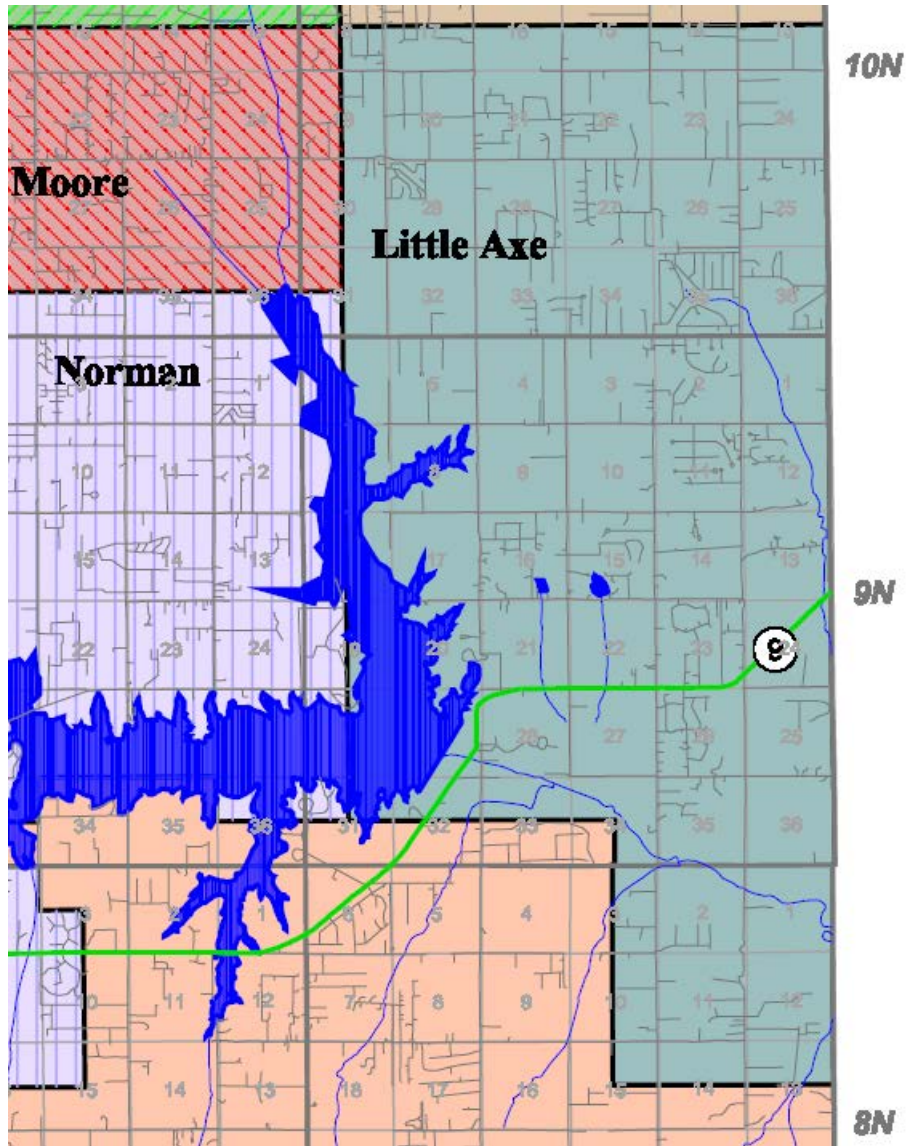
At the turn of the twenty-first century, Cleveland County had six public school districts: Lexington; Little Axe; Moore; Noble; Norman and Robin Hill. Education and research opportunities abound at the University of Oklahoma campus (enrollment 20,000) and over a dozen colleges and universities that are within a 45 minute drive of Norman.

Moore-Norman Technology Center provides the nation's premier business and industry training program. The towns in the county provide a business friendly atmosphere designed to encourage economic development.

Little Axe Public Schools and Robin Hill Public Schools are rural school districts in **Cleveland County**.

## Little Axe Public School District

**Little Axe Public School District** serves students in northeastern Cleveland County with a total district enrollment of 1223 (latest available). It is bounded by Moore, Norman, McLoud and Noble School Districts.



**Little Axe Elementary**  
Enrollment - 602 Grades Pre-K – 5



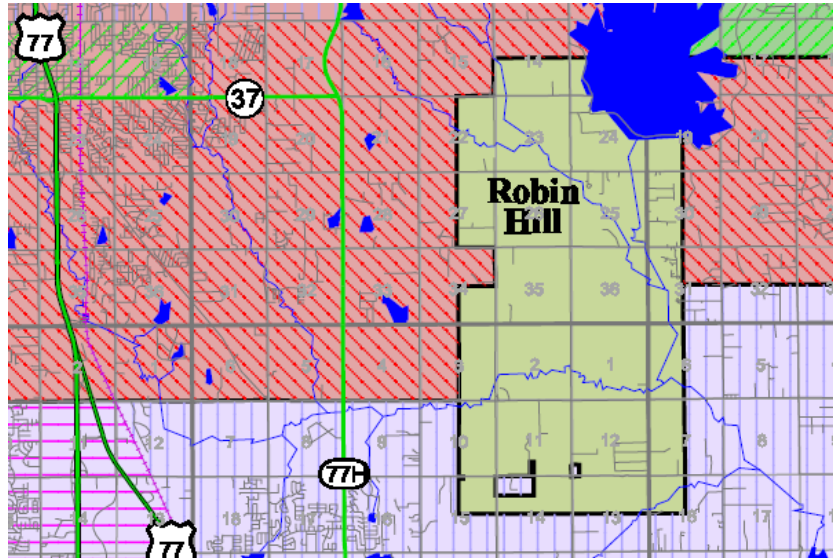
**Little Axe Middle School**  
Enrollment - 245 Grades 6-8



**Little Axe High School**  
Enrollment 368 Grades 9-12

## Robin Hill Public School District

**Robin Hill Public School District** – Robin Hill Public School District serves students in central Cleveland County in grades Pre-K – 8 with a total enrollment of 222. It is bounded by the Moore and Norman School Districts.



**Robin Hill Elementary School**  
Enrollment 222 Grades Pre-K – 8

**Lexington Public School District**



**#1 – Lexington Elementary/Junior High**

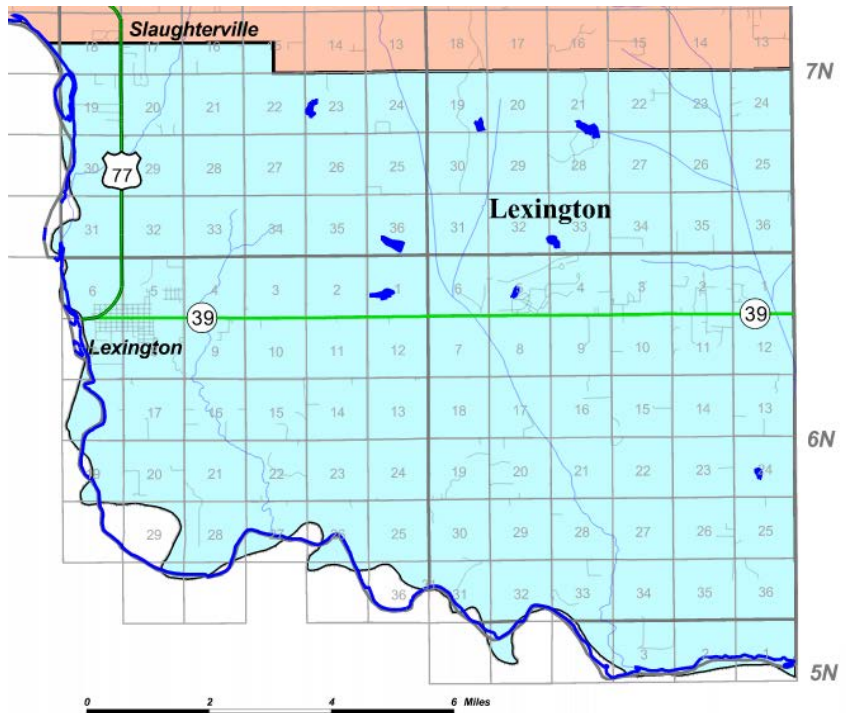


**#2 – Lexington High School**



**#3 – Aerial view of both Lexington Public Schools**

**Lexington Public School District** – serves students in the southern part of Cleveland County in grades Pre-K through 12 with a total enrollment of 1,069 students.





**Lexington Elementary School**  
Enrollment 476 – Grade Pre-K – 5



**Lexington Intermediate School**  
Enrollment 165 grades 5-6



**Lexington Junior High School**  
Enrollment 209 in grades 7-9

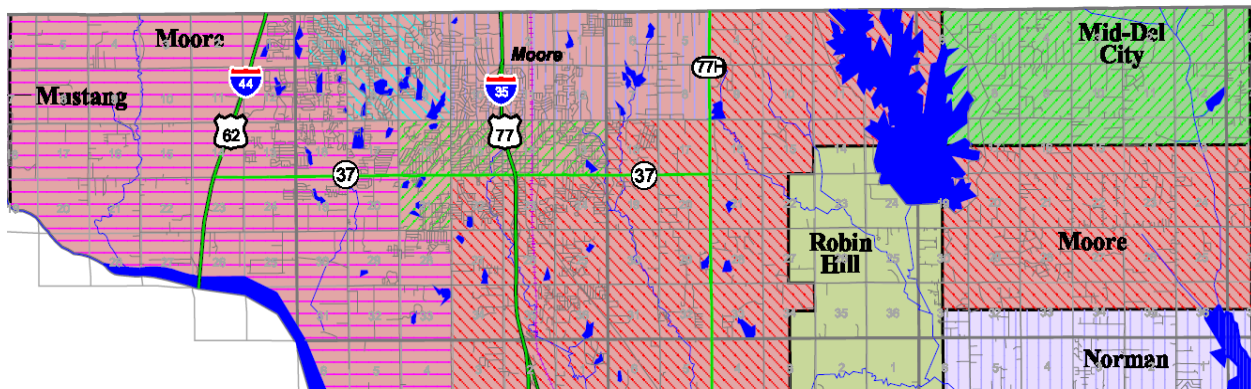


**Lexington High School**  
Enrollment 206 grades 10-12

## **MOORE PUBLIC SCHOOL DISTRICT**

**MOORE PUBLIC SCHOOL DISTRICT** – Moore Public School District serves students in northern Cleveland County in grades Pre-K – 12 with a total enrollment of 22,226. Moore Public School District is the third largest in the State of Oklahoma.

The Moore Public School District incorporates much of northern Cleveland County offering pre-K through 12th grade in the suburban areas of Moore and south Oklahoma City. With a student population of over 23,000, the system is the third largest in the state. The staff of some 2,500 employees includes about 1,400 certified personnel who have an average of 13 years of experience and more than 500 advanced degrees.



## **ELEMENTARY SCHOOLS**

Moore Public Schools has 23 elementary schools, grades kindergarten through sixth. Approximately 11,000 students are enrolled in elementary schools. A four-year-old pilot program is offered at 15 elementary schools.

The elementary curriculum emphasizes academic, social and communication skills and is designed to allow students to progress at a developmentally appropriate pace. Each elementary school has a media center staffed with a full-time media specialist, a counselor, and music and physical education classes taught by certified instructors.

**NOTE: During a tornado on May 20, 2013, Plaza Towers Elementary School and Briarwood Elementary School were destroyed. School was still in session and at Plaza Towers Elementary School seven students were fatalities when interior wall collapsed on them. Highland East Jr. High School and the District Administration Building also received heavy damage. All schools started school on schedule in September although some were in temporary facilities. School rebuilding has also begun.**



**Apple Creek Elementary**



**Briarwood Elementary**



**Broadmoore Elementary**



**Bryant Elementary**



**Central Elementary**



**Earlywine Elementary**



**Eastlake Elementary**



**Fisher Elementary**



**Fairview Elementary**



**Heritage Trails Elementary**



**Houchin Elementary**



**Kelley Elementary**





**Kingsgate Elementary**



**Northmoor Elementary**



**Oakridge Elementary**



**Plaza Towers Elementary**



**Red Oak Elementary**



**Santa Fe Elementary**



**Sky Ranch Elementary**



**Sooner Elementary**



**Southgate-Rippetoe Elementary**



**Wayland Bonds Elementary**



**Winding Creek Elementary**

### **JUNIOR HIGH SCHOOLS**

Moore Public Schools has five junior high schools, grades seven and eight. Approximately 4,700 students are enrolled in junior high. The junior high schools provide a challenging and caring school climate that seeks to develop strong academic foundations, discover special interests, and provide activities for personal and social growth.

Moore's junior high school curriculum bridges the gap between elementary and high school focusing on basic skills, decision-making, critical thinking and exploration of elective subjects. It allows students to learn to organize their world and make progress toward personal independence.



**Brink Jr. High**  
Enrollment 876 Grades 6-8



**Central Jr. High**  
Enrollment 553 Grades 6-8



**Highland East Jr. High**  
Enrollment 673 Grades 6-8



**Highland West Jr. High**  
Enrollment 608 Grades 6-8



**Moore West Jr. High**  
Enrollment 658 Grades 6-8

### **HIGH SCHOOLS**

Each day approximately 5,900 students attending Moore, Southmoore and Westmoore High Schools participate in quality academic and extracurricular activities, while experiencing a strong tradition of learning excellence. A tradition strengthened through strong collaboration among faculty, parents and students. In addition to core curriculum courses, a wide variety of offerings include: AP courses, electives and career/technology programs. The curriculum is aligned to college entrance exams and requirements.



**Moore High School**  
Enrollment 2165 Grades 9-12



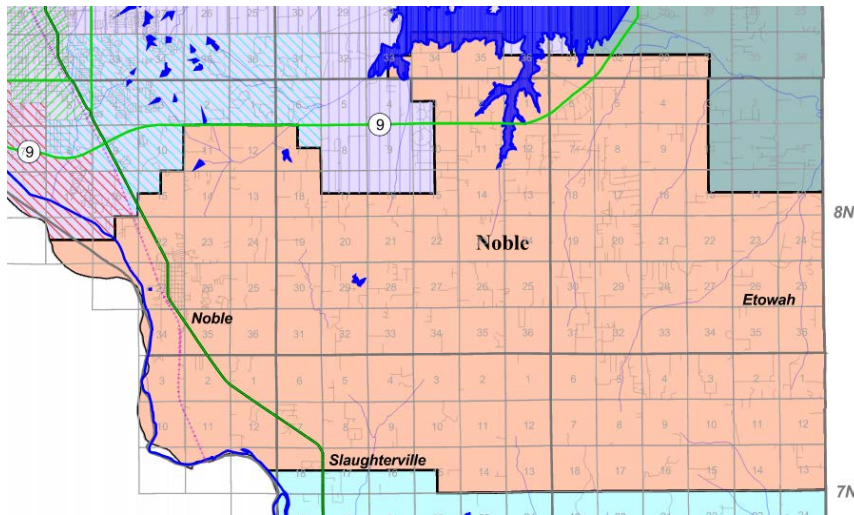
**Southmoore High School**  
Enrollment 1983 Grades 9-12



**Westmoore High School**  
Enrollment 1950 Grades 9-12

## **Noble Public School District**

**Noble Public School District** serves students in south-central Cleveland County in grades Pre-K through 12 with a total enrollment of 2,999 students.



### **ELEMENTARY SCHOOLS**



**Katherine Daily Elementary School**  
Enrollment 602 Grades Pre-K -1



**John Hubbard Elementary School**  
Enrollment 445 Grades 2-3



**Pioneer Inter Elementary School**  
Enrollment 465 Grades 4-5



**Pioneer Intermediate School**  
Enrollment 667 Grades 6-8

## SECONDARY SCHOOLS



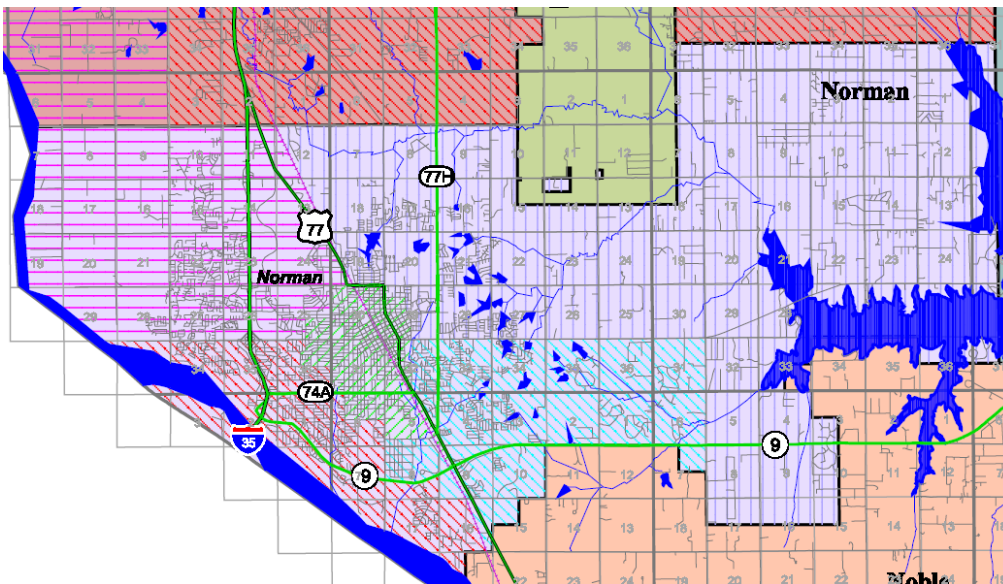
**Curtis Inge Middle School**  
Enrollment 667 Grades 6-8



**Noble High School**  
Enrollment 816 Grades 9-12

## Norman Public School District

The Norman Public School District serves students Pre K – 12<sup>th</sup> grade who live in the central part of Cleveland County.



## Elementary Schools



**Adams Elementary**  
Enrollment – 491 Grades Pre K – 5



**Cleveland Elementary**  
Enrollment – 525 Grades Pre K – 5



**Eisenhower Elementary**  
Enrollment – 560 Grades Pre K - 5



**Jackson Elementary**  
Enrollment – 500 Grades Pre K – 5



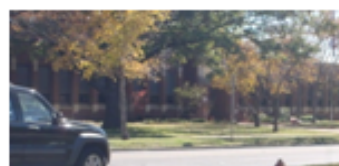
**Jefferson Elementary**  
Enrollment – 393 Grades Pre K – 5



**Kennedy Elementary**  
Enrollment – 585 Grades Pre K – 5



**Lakeview Elementary**  
Enrollment – 251 Grades Pre K – 5



**Lincoln Elementary**  
Enrollment – 307 Grades Pre K – 5



**Madison Elementary**  
Enrollment – 587 Grades Pre K – 5



**McKinley Elementary**  
Enrollment – 303 Grades Pre K – 5



**Monroe Elementary**  
Enrollment – 387 Grades Pre K – 5



**Roosevelt Elementary**  
Enrollment – 685 Grades Pre K – 5



**Truman Elementary**  
Enrollment – 394 Grades 3 – 5



**Washington Elementary**  
Enrollment – 666 Grades Pre K – 5



**Wilson Elementary**  
Enrollment – 254 Grades Pre K – 5

**Middle Schools**



**Alcott Middle School**  
Enrollment 618 Grades 6-8



**Irving Middle School**  
Enrollment 775 Grades 6-8



**Longfellow Middle School**  
Enrollment 621 Grades 6-8



**Whittier Middle School**  
Enrollment 1074 Grades 6-8

**High Schools**



**Norman High School**  
Enrollment 1680 Grades 9-12



**Norman North High School**  
Enrollment 2113 Grades 9-12



education. They also provide professional assistance to businesses in order to help them achieve their business goals.

Each year, MNTC serves more than 40,000 adults through conference facilities and continuing education classes, and, provides hundreds of businesses training designed to increase their profitability and enhance their organizational performance.

MNTC also serves over 1,100 secondary and post-secondary students enrolled in nearly 80 career majors, many of which are nationally accredited. Through participation in Cooperative Alliance Agreements with OCCC, OSU-OKC and Rose State, most career major students can earn college credit while enrolled at MNTC.

Additionally, MNTC offers a range of unique community outreach programs and services: Career Awareness Night, CareerQuest, Summer Youth Academy, and the business incubator. MNTC is a multiple recipient of the Gold Star School Award, is ISO registered, and was awarded the Oklahoma Quality Award at the Achievement Level in 2007.

District population is 232,942 based on 2010 census data. School districts served include Moore and Norman.

## **University of Oklahoma**



Founded in 1890, it existed in Oklahoma Territory near Indian Territory for 17 years before the two became the state of Oklahoma. As of 2007 the university had 29,931 students enrolled, most located at its main campus in Norman. Employing nearly 3,000 faculty members, the school offers 152 baccalaureate programs, 160 master's programs, 75 doctorate programs, and 20

majors at the first professional level. David Boren, a former U.S. Senator and Oklahoma Governor, has served as President of the University of Oklahoma since 1994.

Attracting top students from across the nation and more than 100 countries around the world, OU provides a major university experience in a private college atmosphere. OU is number one in the nation in



the number of National Merit Scholars enrolled among public universities and is in the top ten of public universities in the nation in the graduation of Rhodes Scholars.

<b>OU Headcount by Campus</b>	<b>Enrollments</b>		<b>Percent Change</b>
	<b>Fall 2011</b>	<b>Fall 2012</b>	
<small>Campus Enrollments represent all students attending classes on each campus. Students may be enrolled on multiple campuses.</small>			
Norman On-Campus Enrollment	23,850	24,144	1.2%
OU Outreach Programs			
Liberal Studies Total Enrollment	1,648	1,719	4.3%
Academic Programs Enrollment	529	1,146	116.6%
Advanced Programs Enrollment	1,354	1,326	-2.1%
Health Sciences Center On-Campus Enrollment	2,728	2,763	1.3%
Health Sciences Center Off-Campus Enrollment	214	193	-9.8%
OU-Tulsa Enrollment in Norman Campus Programs	675	741	9.8%
OU-Tulsa Enrollment in Health Sciences Center Programs	682	649	-4.8%
OU-Tulsa Enrollment in Liberal Studies	46	47	2.2%

The OU Honors College is one of the largest honors programs among public universities in the United States, matching the University's best and brightest students with faculty in classrooms of 19 or fewer students. OU is one of the few public universities in the nation to cap the class size of first-year English composition courses at no more than 19. OU offers students the opportunity to study abroad in over 100 cities and 50 countries, including our signature program in Arezzo, Italy. The number of endowed faculty professorships and chaired positions has increased from less than 100 15 years ago to more than 560 today. This enables OU to keep and attract faculty researchers of national and international stature.



The University of Oklahoma Department of Athletics promotes excellence in athletics without compromising excellence in academics or integrity in its commitment to rules or conduct. Student-athletes are encouraged by the coaching and administrative staff to maintain a balance between athletics, academics, and the social aspects of college.

The OU Athletics Department sponsors 21 varsity sports with more than 600 student-athletes and is completely self-supporting.

## Climate

Cleveland County is part of the Central Great Plains in the far western regions of the county and transitions to Crosstimbers over most of the county. Average annual precipitation ranges from about 36 inches in western Cleveland County to nearly 40 inches in the east. May and September are the wettest months, on average, but much of the spring through fall receives sufficient rainfall. Nearly every winter has at least one inch of snow, with one year in three having ten or more inches.

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Thunderstorms occur on about 49 days each year, predominantly in the spring and summer. During the period 1950 - 2011, Cleveland County recorded 65 tornadoes. On occasion, hurricanes affect Cleveland County. As they move onto land they weaken and become Tropical Storms. As they move further inland, they tend to lose strength and move slower, resulting in unusually large quantities of rain over the area. With Cleveland County's relatively flat topography, these storms still create a significant flooding threat.

## References

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Wikipedia.com  
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Oklahoma Department of Agriculture  
Oklahoma Department of Education

## **CHAPTER TWO**

### **The Planning Process**

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Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural and human-caused hazards. The primary purpose of hazard mitigation planning is to identify community policies, actions and tools for implementation over the long term that will result in a reduction of risk and potential for future losses community-wide. This is accomplished by using a systematic process of learning about the hazards that can affect the community, setting clear goals, identifying appropriate actions, following through with an effective mitigation strategy, and keeping the plan current. The ten step process as outlined in the FEMA 396 How to Guides was followed in the process of developing the Cleveland County Hazard Mitigation Plan.

#### **Phase 1** – Organize resources

**Step 1** – Coordinate/involve all agencies and jurisdictions that want to participate

**Step 2** – Involve the public

**Step 3** – Organize to prepare the plan

#### **Phase 2** – Assess the Risks

**Step 4** – Assess what the natural hazards are

**Step 5** – Assess the problem

#### **Phase 3** – Develop the Mitigation Plan

**Step 6** – Develop list of goals

**Step 7** – Develop list of mitigation actions.

**Step 8** – Draft an action plan

#### **Phase 4** – Implement and Monitor progress

**Step 9** – Adopt the Plan

**Step 10** – Implement, evaluate and revise the plan

### **Cleveland County Hazard Mitigation Plan Formation**

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Notices designed to encourage interest from the public was printed when possible during the process. (Copy of Invitation letter in Appendix A) The Cleveland County Hazard Mitigation Planning Team was formed to provide guidance during the development of this Plan. The Team was comprised of representatives from local governments, county government, state government, public schools, local businesses and private citizens. The Cleveland County Hazard Mitigation Planning Team (CCHMPT) was formed during the first meeting. Public

meetings of the CCHMPT were held and a great amount of information was derived from participants during those meetings.

It should also be noted that while everyone attending the meetings was attentive and remained during the duration of the meetings some did not offer suggestions or ideas. They were in agreement with the reviews presented in the review process, reviewing all major components that had been brought together at previous meetings. The major components reviewed at the meeting after they were originally developed were: purpose of hazard mitigation plans; goals; identified hazards; assessments; critical facilities; projects and prioritization and implementation responsibilities.

Table 2-1 lists the Cleveland County Hazard Mitigation Planning Team members, their affiliation and their positions in the community. The listing given here indicates the planning team member identified by each jurisdiction to represent them on the team. See **Appendix A** for meeting minutes and contributions by all participants including the planning team members.

**NOTE: Some members listed in the planning team are no longer involved due to various reasons such as retirement, illness, moving, etc. Their replacement is not listed because they did not participate at the time the plan meetings were occurring.**

**Table 2-1**

<b>CLEVELAND COUNTY HAZARD MITIGATION PLANNING TEAM</b>		
<b>Name</b>	<b>Affiliation</b>	<b>Position</b>
<b>Dan Cary -Chairman</b>	Cleveland Co.	Emergency Manager
Rod Cleveland	Cleveland Co.	Commissioner- District 1
George Skinner	Cleveland Co.	Commissioner- District 2
Rusty Sullivan	Cleveland Co.	Commissioner-District 3
Janet Green	Etowah, Town	Town Clerk / Treasurer
Denny Prince	Lexington Public Schools	Superintendent
Jansen Idlett	Lexington, City	Fire Chief
Tony Smith	Little Axe Public Schools	Superintendent
Brad Fernberg	Moore Public Schools	Assistant Superintendent
Gayland Kitch	Moore, City	Emergency Manager / Communications Director
Steve Eddy	Moore, City	City Manager
Chris Klein	Moore-Norman Technology Center	EHS Officer
Eva Dunn	Noble Public Schools	Child Nutrition Director
Keith Springstead	Noble, City	Chief of Police
Shane Cohea	Norman Regional Hospital	Safety Manager
Peggy Laizure	Norman Transcript/ Moore American	Reporter/Editor
Roger Brown	Norman Public Schools	Assistant Superintendent

<b>CLEVELAND COUNTY HAZARD MITIGATION PLANNING TEAM</b>		
<b>Name</b>	<b>Affiliation</b>	<b>Position</b>
David Grizzle	Norman, City	Emergency Manager
Jim Martin	Robin Hill Public School District	Superintendent
Marsha Blair	Slaughterville, Town	Town Administrator
Mike Montgomery	University of Oklahoma	Director of Risk Management
George Mauldin	Cleveland County	Emergency Management Director
Lisa Teel	University of Oklahoma	Emergency Preparedness Manager

**Cleveland County CCHMPT Meetings**



# CHAPTER THREE

## Hazard Identification and Assessment

Only natural hazards are profiled in this plan. In 2007 and again in 2011, the Cleveland County Hazard Mitigation Planning Team (CCHMPT) and disaster professionals reviewed the hazards which could occur and hazards which have actually occurred in Cleveland County. The review was based on historical data, public input and experience of the CCHMPT members to identify the natural hazards most likely to impact Cleveland County.

### Review of Natural Hazards

Possible hazards were reviewed by the Cleveland County Hazard Mitigation Planning Team and through public input during the meetings held in 2011. The planning team initially went through the possible hazards in a roundtable discussion, based on their personal knowledge and experience in Cleveland County.

Eleven hazards are profiled in this plan. The team discussed Landslides and Expansive Soils and determined these were not a problem in Cleveland County at this time, so they are not profiled in this plan. Although other natural hazards certainly exist, their occurrence is rare in Oklahoma and they have caused no known damage in Cleveland County. Future editions of this plan will contain information on those only if an occurrence has a significant impact to the risk of human life or property in Cleveland County.

The probability of occurrence shown (Table 3-1) is the determination, based on past history and consideration of the elements necessary for a specific disaster event to occur. Combined with how many of those factors are present, estimates of how likely a hazard is to occur in Cleveland County can better be estimated.

**Table 3-1**

Through reviewing FEMA disaster declarations for the county since 2005, NCDRC data, reports

PROBABILITY OF OCCURRENCE - DEFINITION	
<b>4-HIGHLY LIKELY</b>	Event is probable within the calendar year. Event has a 1 in 1 year chance of occurring.
<b>3-LIKELY</b>	Event is probable within the next three years. Event has up to 1 in 3 year's chance of occurring.
<b>2-POSSIBLE</b>	Event is probable within the next 5 years. Event has up to 1 in 5 year's chance of occurring.
<b>1-UNLIKELY</b>	Event is possible within the next 10 years. Event has up to 1 to 10 years chance of occurring.

completed by the County Emergency Management office, and the public survey input, the following list was compiled:

**Table 3-2**


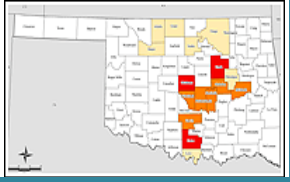



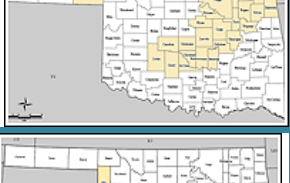

<b>CLEVELAND COUNTY NATURAL HAZARDS</b>		
<b>Hazard</b>	<b>How reviewed</b>	<b>Why identified</b>
<b>Dam failure</b>	<ul style="list-style-type: none"> <li>Oklahoma Water Resources Board</li> <li>CCHMPT input</li> <li>Public Input</li> </ul>	There has never been a dam failure in Cleveland County; however, there are six high hazard dams in Cleveland County.
<b>Drought</b>	<ul style="list-style-type: none"> <li>Oklahoma Climatological Survey,</li> <li>Oklahoma Water Resources Bulletin,</li> <li>Historical Data</li> </ul>	Recent episodes of drought.
<b>Earthquake</b>	<ul style="list-style-type: none"> <li>Oklahoma Geological Survey</li> <li>Past Historical Records</li> </ul>	Past history, existing nearby faults within central Oklahoma.
<b>Extreme heat</b>	<ul style="list-style-type: none"> <li>National Weather Service</li> <li>Oklahoma Climatological Survey</li> </ul>	Oklahoma has prolonged periods of high temperatures and is prone to wide swings of temperature
<b>Flood</b>	<ul style="list-style-type: none"> <li>Local Emergency Management Records</li> <li>Public Input</li> <li>FEMA Declarations</li> <li>NCDC</li> </ul>	There has been a past history of major flooding in Cleveland County due to heavy rains and inadequate drainage.
<b>Hailstorm</b>	<ul style="list-style-type: none"> <li>Local Input</li> <li>NCDC</li> </ul>	Cleveland County experiences hailstorms during severe thunderstorms.
<b>High winds</b>	<ul style="list-style-type: none"> <li>NCDC data</li> <li>Public Input</li> <li>Team Hazard Survey</li> <li>Oklahoma Climatological Survey</li> <li>National Weather Service</li> <li>Storm Prediction Center</li> </ul>	Oklahoma experiences hundreds of severe thunderstorms high winds every year, including downdrafts that have damaged structures.
<b>Lightning</b>	<ul style="list-style-type: none"> <li>NCDC data</li> <li>Public Input</li> <li>Team Hazard Survey</li> <li>Oklahoma Climatological Survey</li> <li>National Weather Service</li> </ul>	Oklahoma experiences hundreds of severe thunderstorms with lightning every year.
<b>Tornado</b>	<ul style="list-style-type: none"> <li>Local Emergency Management Records</li> <li>Public Input</li> <li>FEMA Declarations</li> <li>NCDC</li> </ul>	Oklahoma has a distinction as the epicenter of Tornado Alley. Cleveland County has experienced recent tornados.
<b>Wildfire</b>	<ul style="list-style-type: none"> <li>Fire Department Records</li> <li>Public Input</li> </ul>	Local FD records reflect damage from wildfires frequently in Cleveland County.
<b>Winter storm</b>	<ul style="list-style-type: none"> <li>Public Input</li> <li>National Weather Service</li> <li>FEMA Declarations</li> </ul>	Severe ice and snowstorms occur regularly in central Oklahoma. The last occurrence was in 2011.

Throughout this plan we discuss the potential of future hazards being profiled using a basic percentage model to determine the risk probability.

## Recent Disaster History


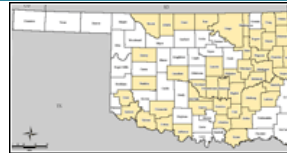
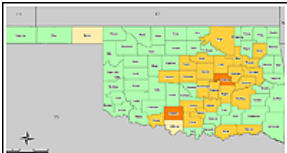
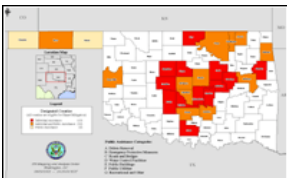

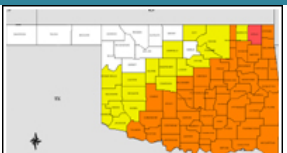
Cleveland County has had thirteen natural disasters since 2001 for which the county has been declared a disaster area by the President of the United States. The table below has a summary of the federally declared disaster history of Cleveland County.

**Table 3-3**

Disasters in Cleveland County – 2001 through June 2013				
Incident Period	Nature of Disaster	FEMA #	Declaration Date	Declaration Area
May 18 – June 2, 2013	Severe Storms, Tornadoes	FEMA -DR -4117	May 20, 2013	
May 10, 2010 – May 13, 2010	Severe Storms, Tornadoes, and Straight-Line Winds	FEMA-1917-DR	May 24, 2010	
January 28, 2010 – January 30, 2010	Severe Winter Storm	FEMA-DR-1883	March 5, 2010	
December 24, 2009 – December 25, 2009	Severe Winter Storm	FEMA-DR-1876	February 25, 2009	
April, 9, 2009 – April 12, 2009	Wildfires	FEMA-DR-1846	June 19, 2009	
December 8, 2007 – January 3, 2008	Severe Winter Storms	FEMA-DR-1735	December 18, 2009	
August 18, 2007 – September 12, 2007	Severe Storms, Tornadoes, and Flooding	FEMA-DR1718	August 24, 2007	



## Disasters in Cleveland County – 2001 through June 2013

Incident Period	Nature of Disaster	FEMA #	Declaration Date	Declaration Area
June 10, 2007 – July 25, 2007	Severe Storms, Tornados, and Flooding	FEMA-DR-1712	July 7, 2007	
January 12, 2007 – January 26, 2007	Severe Winter Storms	FEMA-DR-1678	February 1, 2007	
November 27, 2005 – March 31, 2006	Severe wildfire threat	FEMA-DR-1623	January 10, 2006	
May 8, 2003 – May 31, 2003	Severe Storms and Tornados	FEMA-DR-1465	May 10, 2003	
January 30, 2002 – February 11, 2002	Ice Storm	1401	February 1, 2002	
December 25, 2000 – January 10, 2001	Severe winter storms	1355	January 5, 2001	

[www.fema.gov/disasters](http://www.fema.gov/disasters)

## HAZARD PROFILE

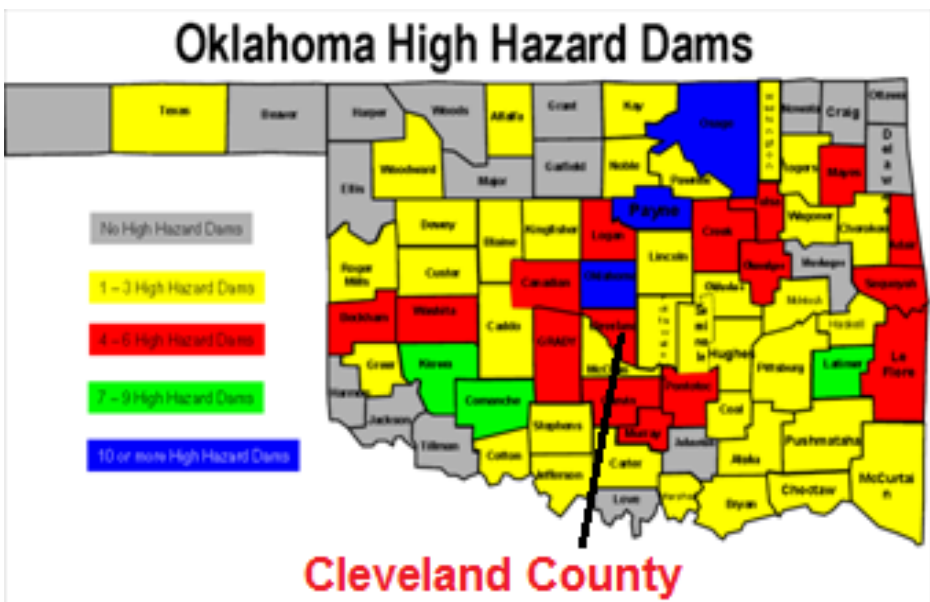
### Dam Failure - Cleveland County

According to the Oklahoma Water Resources Board (OWRB), Oklahoma has over 4,500 dams. Many are small farm and ranch ponds, or small lakes.

A dam is an artificial barrier usually constructed across a stream channel to impound water. Timber, rock, concrete, earth, steel or a combination of these materials may be used to build the dam. The dams in Cleveland County are constructed of earth or concrete. Dams must have spillway systems to safely convey normal stream and flood flows over, around, or through the dam. Spillways are commonly constructed of non-erosive materials such as concrete. Dams should also have a drain or other water-withdrawal facility for control of the pool or lake level and to lower or drain the lake for normal maintenance and emergency purposes.

The amount of water impounded is measured in acre-feet. An acre-foot is the volume of water that covers an acre of land to a depth of one foot. As a function of upstream topography, even a very small dam may impound or detain many acre-feet of water. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded and the density, type, and value of development and infrastructure located downstream.

In hydrological terms, a dam failure is a catastrophic event characterized by the sudden, rapid and uncontrolled release of an impoundment of water. The map of high-hazard dams was



provided by the National Inventory of Dams. Dams in Oklahoma are inspected by the Oklahoma Water Resources Board if they are non-Federally constructed and maintained dams which are: 1) greater than 6 feet in height with storage

capacities of 50 acre-feet or more; 2) or greater in height with storage capacities of 15 acre-feet or more. The program requires inspections every five and three years for low and significant hazard structures, respectively. It requires annual inspection of the state’s high-hazard dams, so

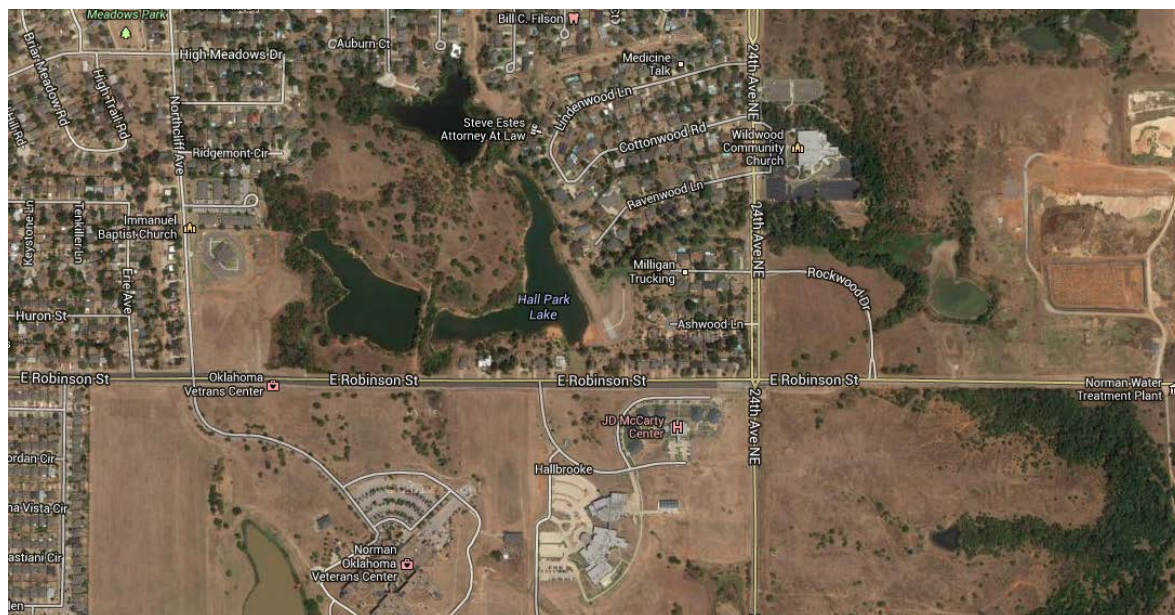
designated due to the presence of one or more habitable structures downstream with loss of life likely to occur if a dam were to fail.

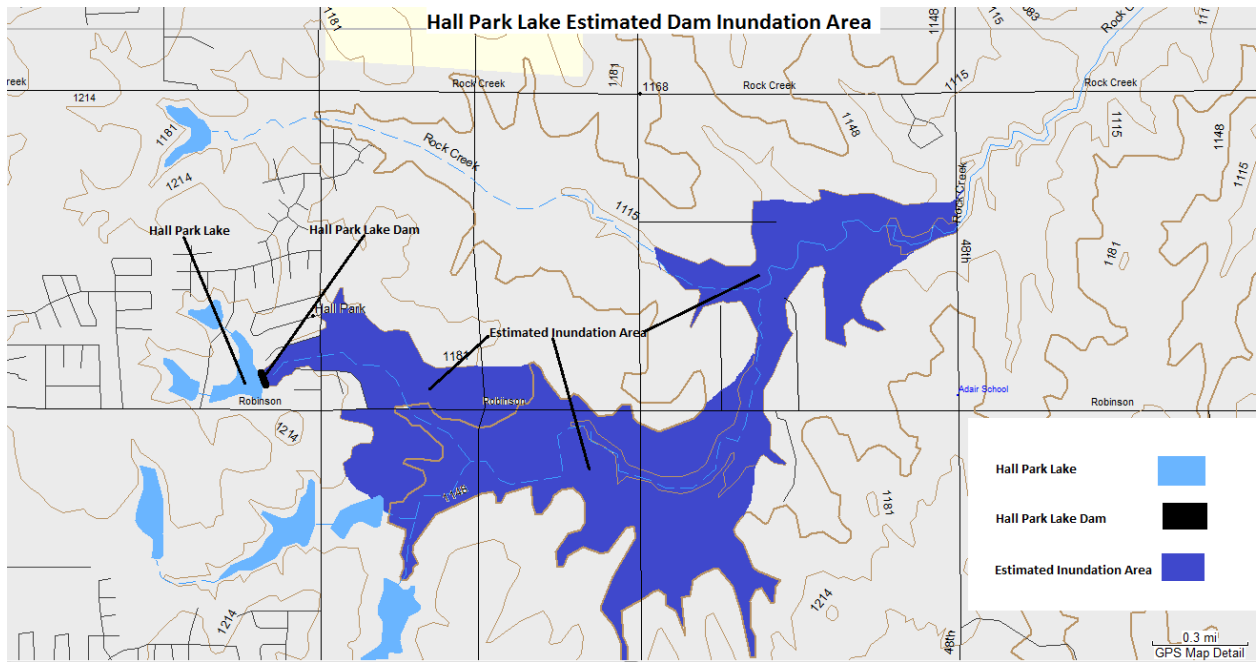
## Location

The dams listed below have been rated by the Oklahoma Water Resources Board as High Hazard dams in Cleveland County. Although there are five (5) high hazard dams located within Cleveland County, only the City of Norman, Robin Hill public school district and areas of unincorporated Cleveland County would be affected by a dam breach. No other jurisdictions would be inundated by a dam failure within the county.

Dam Name	Dam Length	Dam Height	Max Storage	Normal Storage	Surface Area	Drainage Area
Hall Park	600 ft.	21 ft.	144 acre.ft.	98 acre ft.	17 acre ft.	Unavailable
Shadow Lake	751 ft	11 ft	56 acre ft	20 acre ft	17 acre ft	230 acres
Stanley Draper	7,250 ft	111 ft	148,000 a/f	100,000 acre ft	2,900 acre ft	13.07 acres
Summit Lake	810 ft	21 ft	200 acre ft	130 acre ft	18 acre ft	Unavailable
Sutton Wilderness Lake	670 ft	18 ft	170 acre ft	130 a/f	14 acre ft	Unavailable

**HALL PARK:** Hall Park is a small reservoir in Cleveland County. A breach of this dam could affect a few residential properties and several businesses within the city limits of Norman. No public schools, nor the University of Oklahoma nor the Moore Norman Technology Center would be affected by a breach of this dam.





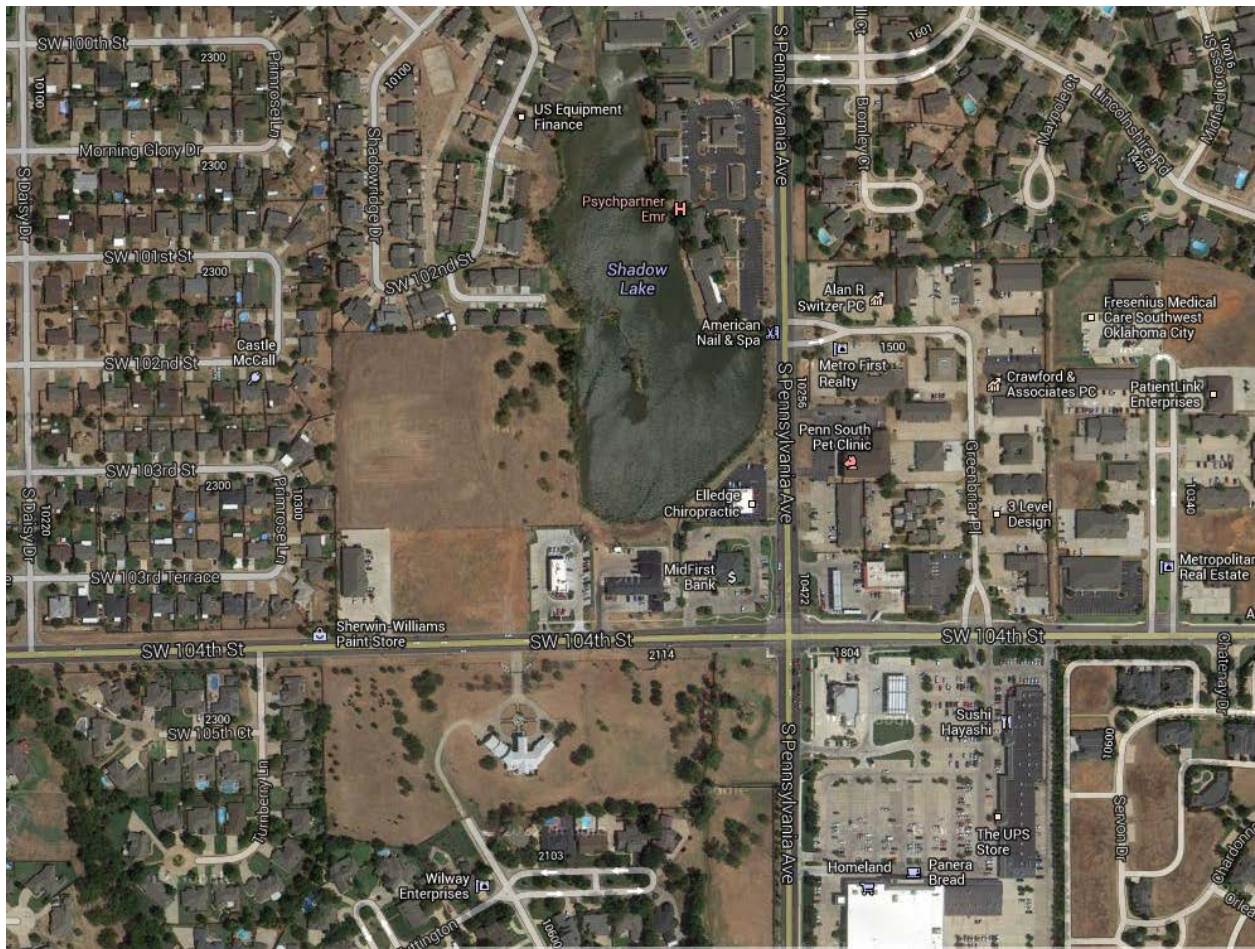
Hall Park Lake Dam estimated inundation zone.



The zone quickly flows into rural areas of Norman however would affect approximately 50 homes along E. Robinson Street, Ashwood Lane, Rockwood Drive, and some homes on Rosewood Lane. (See map following) No public schools are located within this inundation zone.

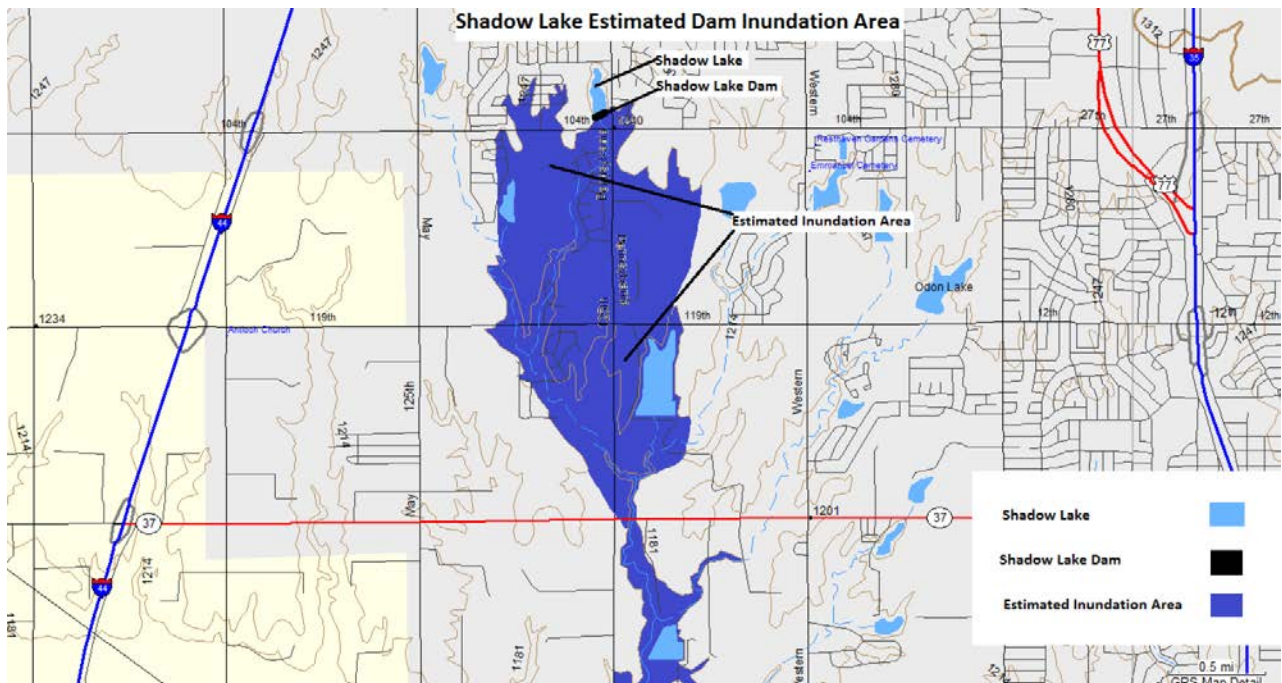


**SHADOW LAKE** - Shadow Lake is a reservoir located 3.9 miles from Moore, in Cleveland County. Numerous businesses have sprung up around the intersection of SW 104<sup>th</sup> and Pennsylvania Ave and further south down Pennsylvania Ave. Many of these businesses would be inundated by flood waters in the event of a dam failure at Shadow Lake. Several housing additions are also located within the estimated inundation area and could experience some flooding. Shadow Lake is a small lake and only the businesses located at the intersection of SW 104<sup>th</sup> and Pennsylvania would risk being destroyed, other locations would experience minor flooding. No Moore Public Schools would be affected by a breach in this dam. (limited information on this lake dam.





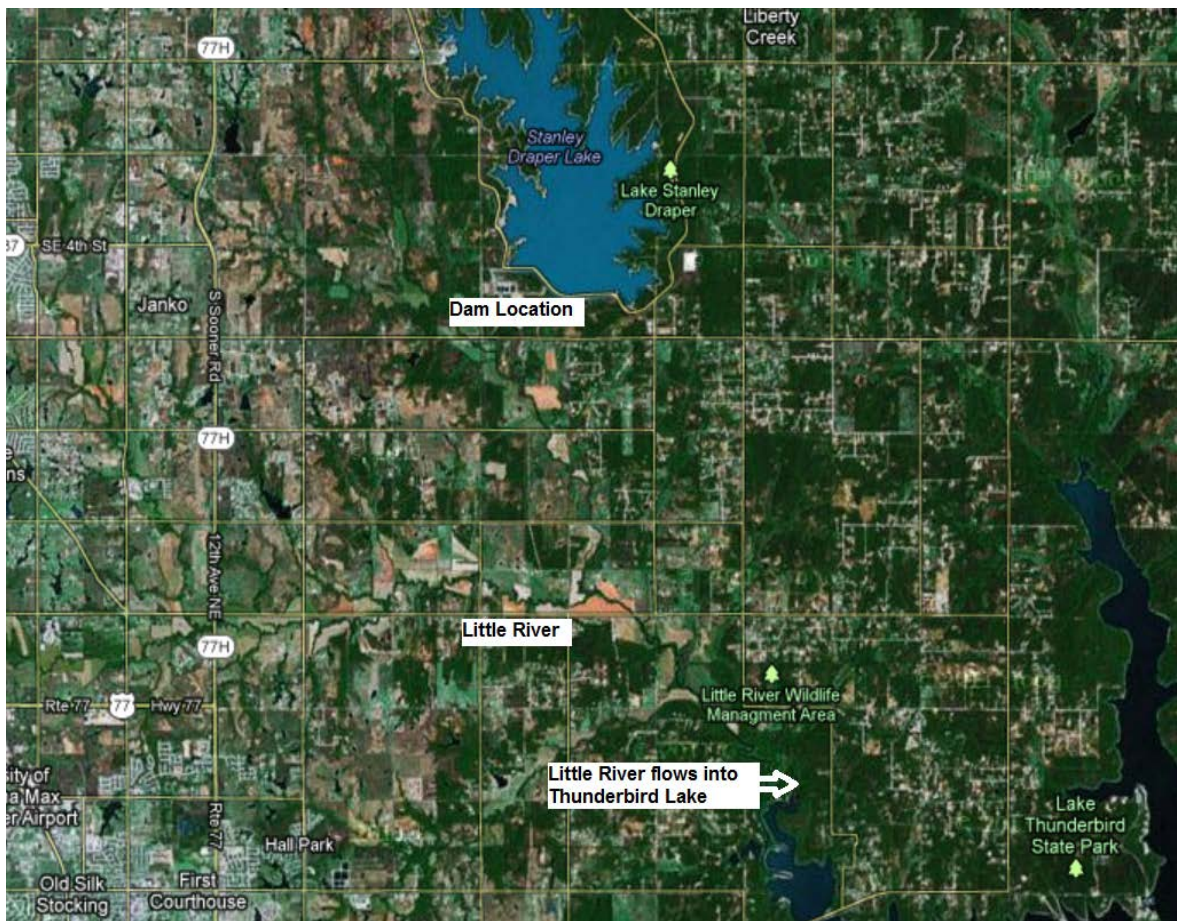
View of Shadow Lake Dam from Pennsylvania near 104<sup>th</sup> Street



### STANLEY DRAPER LAKE:

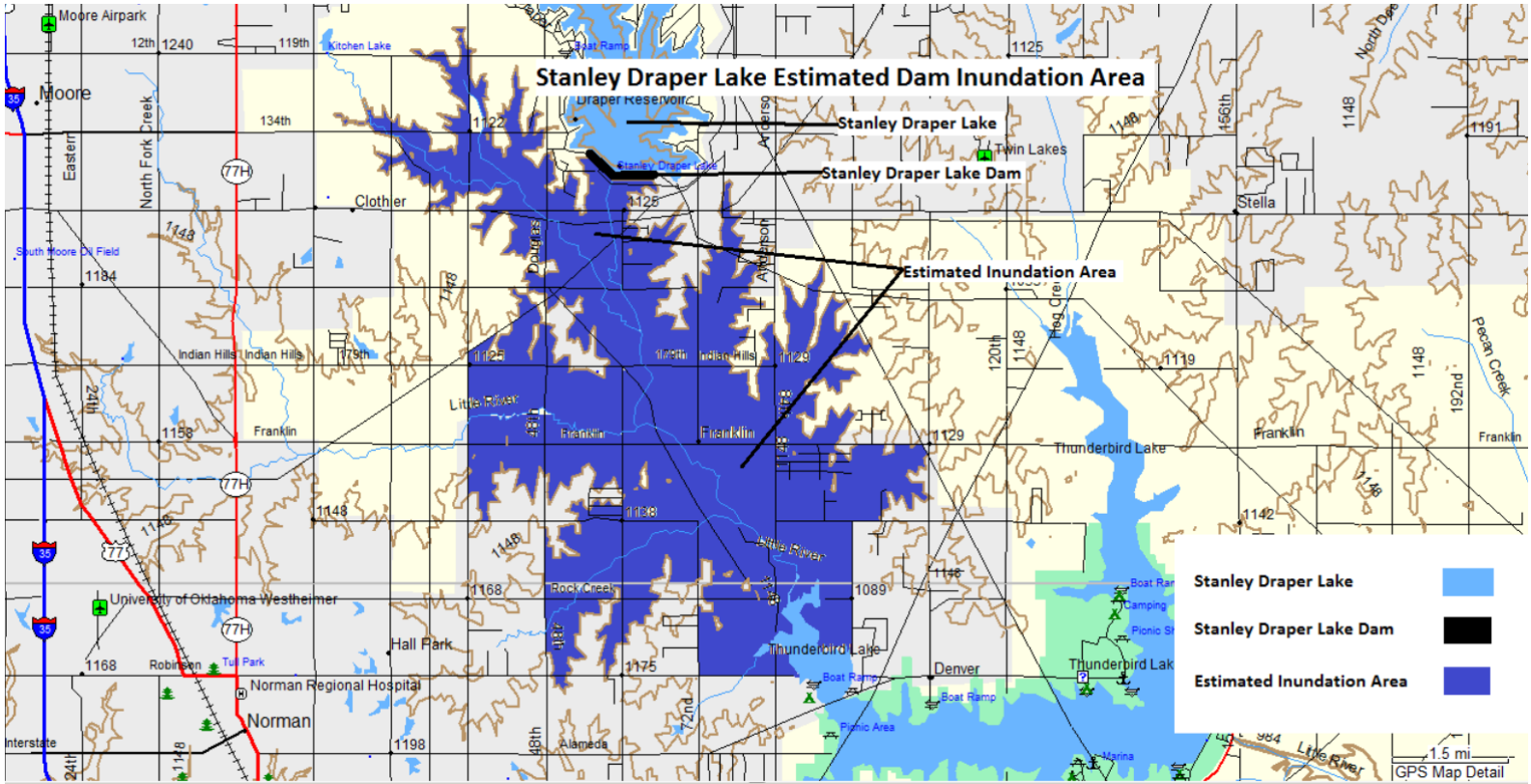
Stanley Draper Dam is a major reservoir on East Elm Creek in Cleveland County and is used for drinking water and recreation purposes. Lake Draper sits just near I-240 in southeast Oklahoma City between Midwest Boulevard and Post Road. The dam is located on the south side near SE 149th. Construction was completed in 1962. It is owned by the City Of Oklahoma City. Stanley Draper is of earthen construction. The lake was named after the prominent, longtime Oklahoma City Chamber of Commerce Director, Stanley Draper, and is one of three Oklahoma City urban reservoirs.

Should the dam fail, Robin Hill School and approximately 100 homes, primarily acreages and small farms and ranches in unincorporated Cleveland County, would be inundated until the flood water reached the Little River five miles south of the dam. The Little River then flows into Thunderbird Lake, another major lake located in Cleveland County but not classified by OWRB as a high hazard dam in Cleveland County. Neither Oklahoma University nor Moore Norman Technology Center would be affected by a breach of the Stanley Draper Lake Dam.

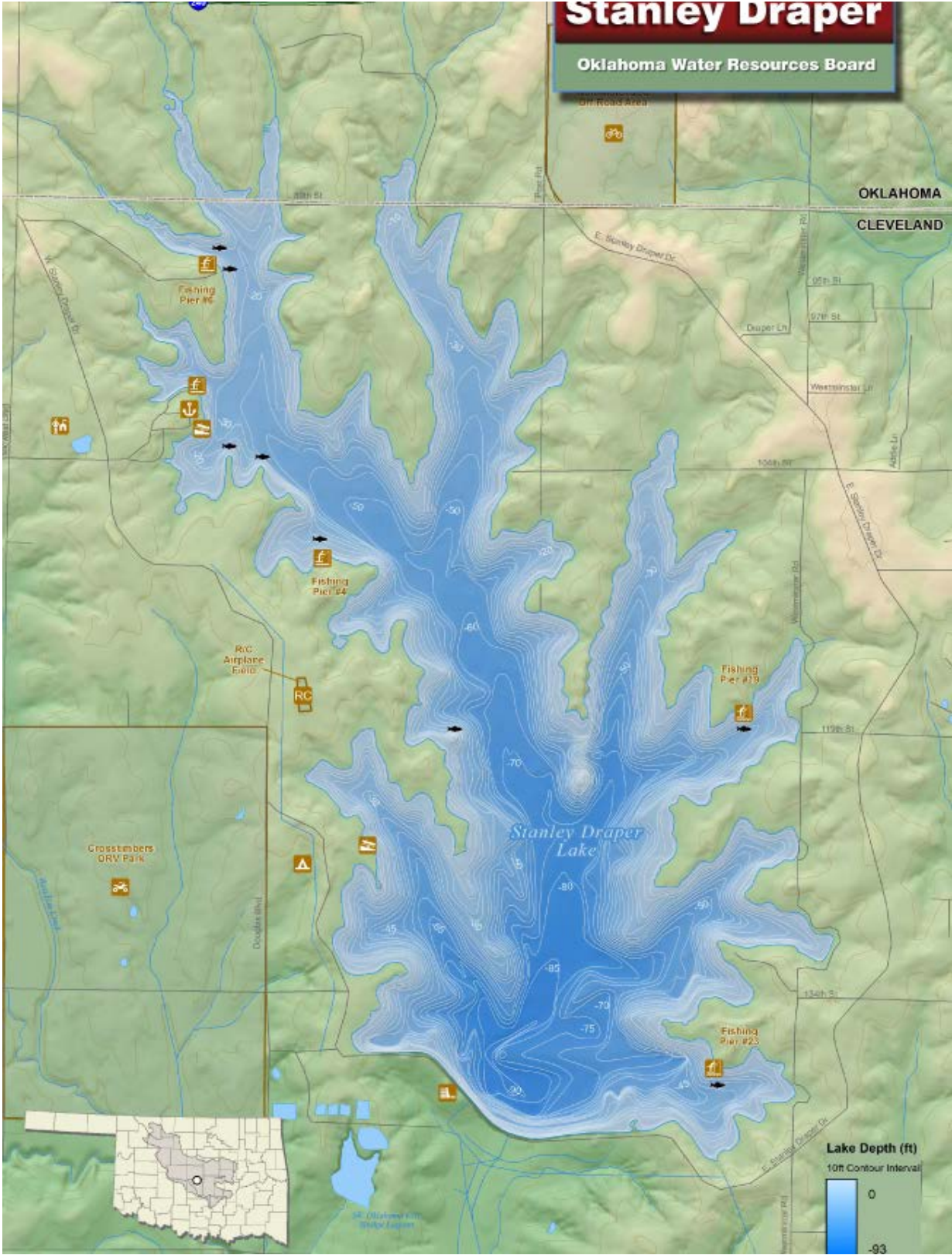


STANLEY DRAPER		1962
		City of Oklahoma City
<b>County:</b> Cleveland		<a href="#">FISHING</a>
<b>Stream:</b> East Elm Creek		<a href="#">WATER QUALITY</a>
<b>Purpose:</b> WS, R*		<a href="#">LAKE LEVELS</a>
<b>Shoreline:</b> 34 miles		<a href="#">RECREATION</a>
<b>Normal Area:</b> 2,459 acres		<a href="#">REPORTS</a>
<b>Normal Pool Elevation:</b> 1,191 ft		<a href="#">HIGH RESOLUTION MAP</a>
<b>Normal Pool Capacity:</b> 87,296 ac-ft		<a href="#">MAP LEGEND</a>
		<a href="#">LAKES INDEX</a>
		<a href="#">OWRB HOME</a>
<small>*Reservoir Purposes: FC=Flood Control, WS=Water Supply, R=Recreation, FW=Fish and Wildlife, WQ=Water Quality, CW=Cooling Water, LF=Low Flow Regulation, N=Navigation, IR=Irrigation, C=Conservation, HP=Hydroelectric Power.</small>		









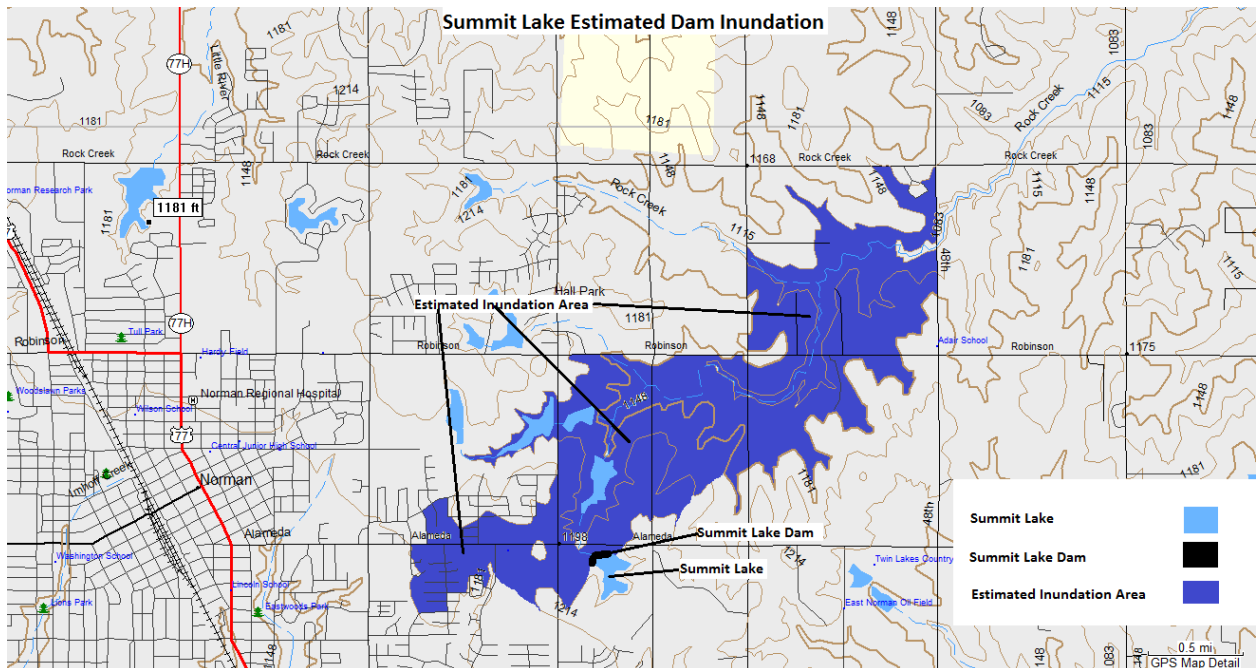
**SUMMIT LAKE:**

Summit Lake is located on the south-east edge of Norman. Summit Lake is a small fishing lake located within a housing development with 320 homes. Should the dam fail, approximately 1/3 of the homes in the SE part of the addition would be affected.

This is a small private lake.



The Moore-Norman Technology Center, Oklahoma University campus nor any public school would be impacted by a breach of the Summit Lake. Only residential properties would be affected.



## SUTTON LAKE WILDERNESS

Sutton Lake is located in the Sutton Urban Wilderness area in the City of Norman. This is a small private lake however it is listed as a High Hazard Dam due to its location in an urban area. A dam breach at Sutton Lake would flow north. Rock Creek Road, along with several houses, would be flooded by a total breach of the dam.



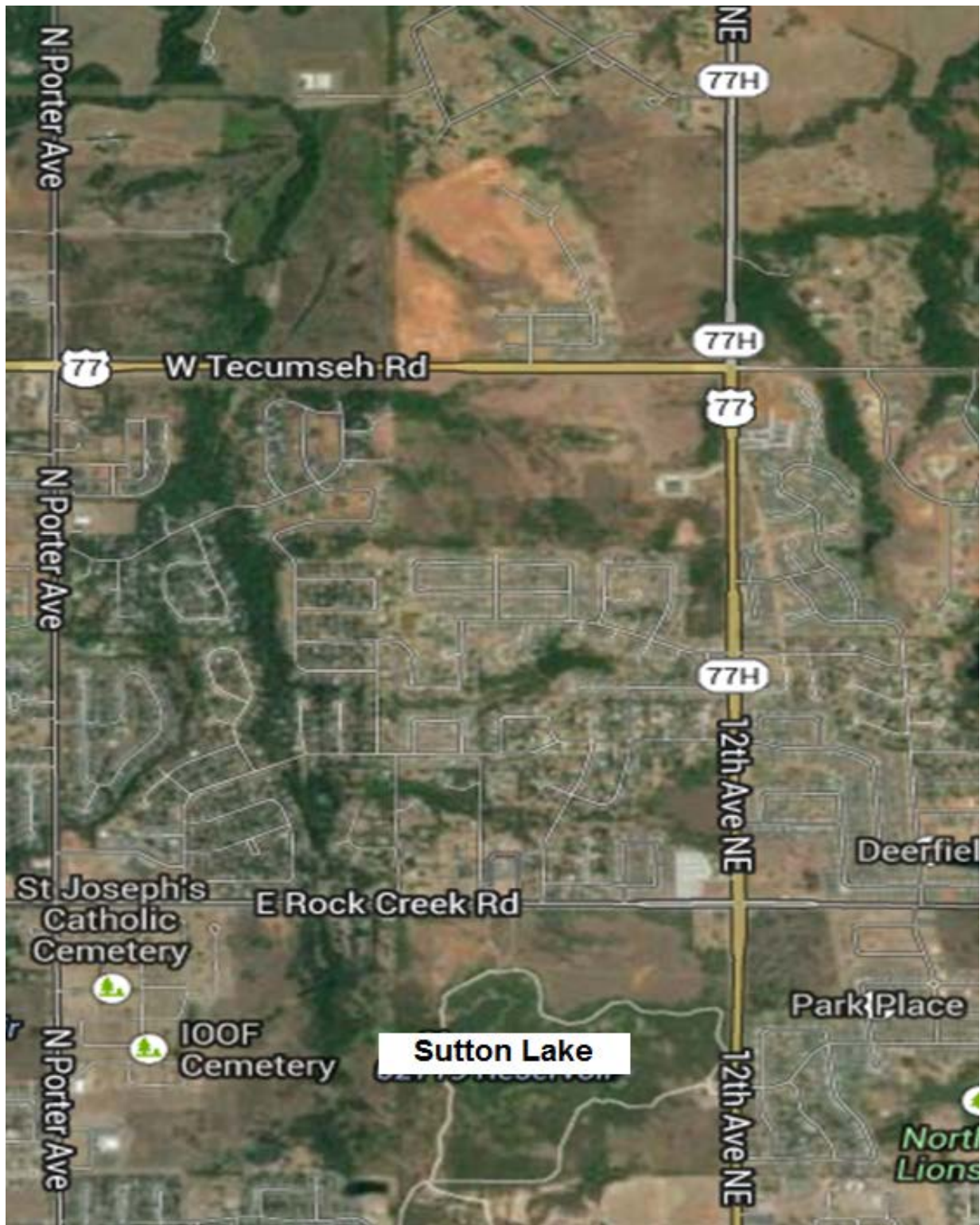
53 acres added through purchase by Norman in 2008

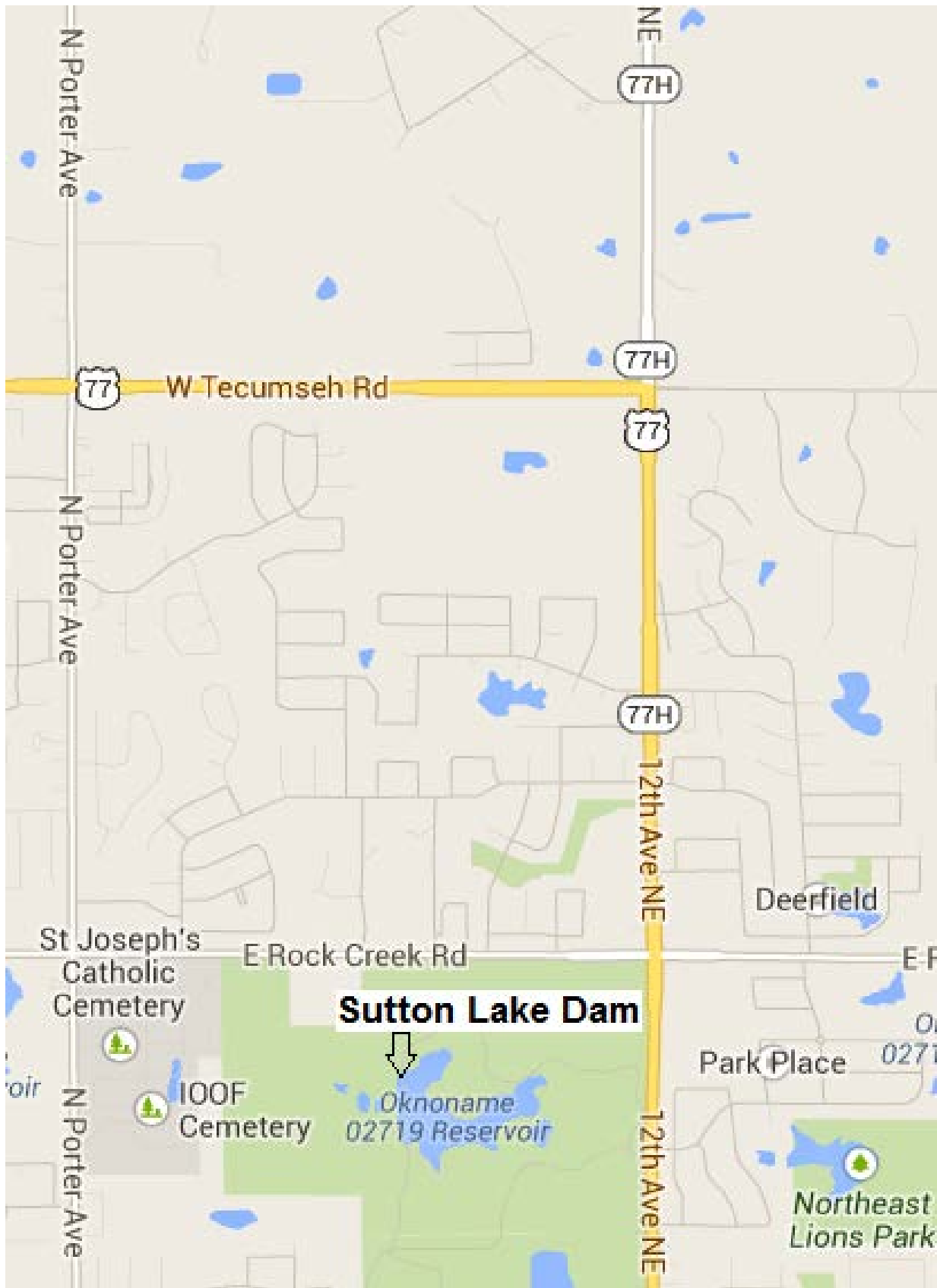
160 acres established as a community park in 1979 through 99-year lease by Norman with state

### SUTTON WILDERNESS PROJECT INFORMATION

Tree removal has been done recently in Sutton Wilderness which has been mainly in the northwest portion of the property and has consisted of removing Red Cedar trees that have spread over the years. This area of the park was originally a tall grass prairie that has been changed dramatically by the infestation of Cedar trees. Park and Recreation Staff are working closely with the Sutton Wilderness Advisory Committee on a management plan which has identified the removal of many of the Cedars in the area and will be followed by replanting of native grasses.

In addition, we have started the removal of trees and shrubs on the west side of the lake dam. This follows an inspection by the State of Oklahoma Water Resources Board (OWRB) which identified the dam as a high hazard dam. The Sutton Wilderness Lake Dam is located on property leased by the City of Norman. The lease states that the City of Norman is responsible for lake maintenance. State law mandates that this dam be maintained per state dam regulations. The root structures from shrubs and particularly large trees can reduce the structural integrity of the dam and if left unmanaged could potentially lead to the failure of the dam. We are responsible for the maintenance of the dam and must now remove the trees and shrubs that are growing there to insure the public safety of those downstream. The Public Works Department will be completing the project by having a contractor complete the removal of any trees and shrubs, address any structural issues that may be needed (at this point we are not aware of any) and establish a low growing ground cover on the back side of the dam. We anticipate this work will take place in the next year or so.







Map provided by the City of Norman



The Moore-Norman Technology Center, nor Oklahoma University campus nor any public school would be impacted by a breach of the Sutton Wilderness Lake. Only residential properties would be affected.

## Extent

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As with any location in which man-made structures are built, potential failure of the structure could place lives and property at risk. The best way to minimize potential failure is to identify structures whose failure could cause the greatest loss of life and/or property, and to require those structures to undergo a rigorous inspection regime. From a hazard management perspective, the most noteworthy structures are those categorized as high-hazard dams. This designation relates solely to potential impacts of a structural breach; it is not an indication of the quality of construction or maintenance. Dam failures can result from any one or a combination of five reasons:

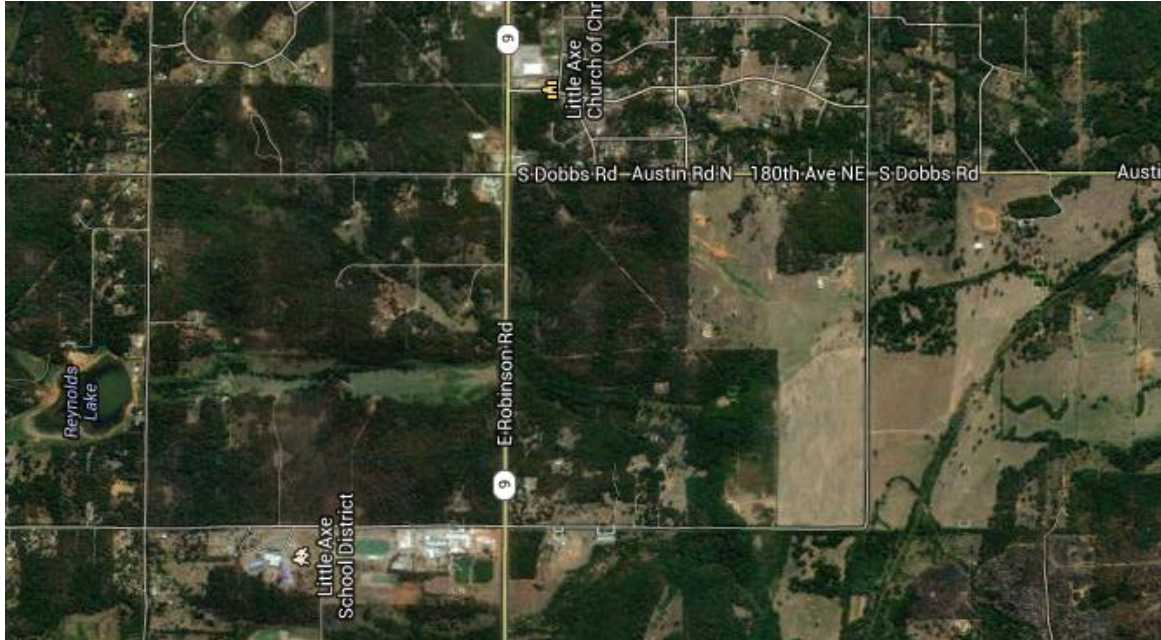
- Overtopping caused by water spilling over the top of a dam
- Structural failure of materials used in dam construction
- Cracking caused by movements like the natural settling of a dam
- Inadequate maintenance and upkeep
- Piping—when seepage through a dam is not properly filtered and soil particles continue to progress and form sink holes in the dam

The Conservation District has indicated that, “As a general rule, in the absence of a formal breach inundation map, we consider the area five miles downstream at the top-of-dam elevation and below to be the potential area of risk.” Using the guidance from the Soil Conservation District, all areas at or below the dam height for five miles downstream from the dams has been classified as the estimated dam inundation zone. Elevation reference marks are provided on the estimated dam inundation zone maps.

A small break or seepage eliciting only 1-inch of flow per minute and causing nominal crop damage is considered a minor severity. Cleveland County considers a breach releasing one foot of water flooding businesses and homes to be a major event

## Previous Occurrences

There has been one known dam breach in Cleveland County that being at Reynolds Lake in northeastern Cleveland County.



The Reynolds Lake dam above collapsed during an extremely heavy rain following Tropical Storm Erin in 2007. At the time, there were no structures affected by the breach of this dam although Reynolds Road was completely washed out below the dam. Reynolds Lake is located in Cleveland County. This dam is not rated high hazard by the Oklahoma Water Resources Board. There is little data available on this lake.



Looking northwest from Reynolds Road to the Reynolds Lake Dam.



Looking south below the dam. Note patching in road and new dirt used to fill after the breach



## Probability of Future Events

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The dams profiled in this plan are either over 50 years old or within a couple of years of reaching that age. Today the dams are in a far different setting than when they were originally constructed. Population has grown; residential and commercial development has occurred downstream from the dams; land uses have changed; sediment pools have filled; concrete and metal components have deteriorated. Today some dams do not meet current dam safety regulations that have been enacted and revised with more stringent requirements than when the dams were built.

*U.S. Natural Resources Conservation Service (NRCS)* has undertaken rehabilitation of some of the dams in Oklahoma. The federal government provides 65 percent of the funding for rehabilitation projects and project sponsors provide 35 percent. Projects are selected on a priority basis with those with high safety and health concerns receiving the highest priority. In 2007 there was \$6.5 million from the legislature available through the Oklahoma Association of Conservation Districts with a potential of \$2.6 – 2.7 million in Rural Economic Action Plan (R.E.A.P) allocations possible. The probability of a Dam Failure in Cleveland County including those in the City of Norman in the future is “**Unlikely.**”

## Vulnerability and Impact

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Dam failures are generally catastrophic if the structure is breached or significantly damaged. Dam failure can occur with little warning. Intense storms may produce a flood in a few hours or even minutes for upstream locations. Dam failure may occur within hours of the first signs of breaching.

Vulnerability and impact are assessed in several ways: the benefits to human society arising from the dam; agriculture, drinking water, damage prevention and power, and benefit to nature and wildlife (especially fish and rare species). The lakes formed by the dams provide recreational activities for local citizens as well as tourists and travelers.

Assessment through the harm caused by dam failure is another way of determining vulnerability and impact due to the disruption of human lives through relocation, loss of employment due to loss of businesses loss of human life, loss of wildlife, livestock and crops. The property losses of homes, vehicles, businesses and through the loss of employment, loss of transportation availability and the loss of communications facilities such as telephones, cell phone sites and

radio towers, would make contact with response agencies more difficult, loss of critical structures and facilities; massive economical loss and even loss of cultural and historical items affecting the knowledge of future generations are major factors when considering vulnerability and impact to an area. A dam failure anywhere in Cleveland County could be an economic disaster for the county depending on the dam causing the problem. Obviously smaller lakes would not have the same effect as the larger ones. See Appendix C – Critical Facilities for more information on vulnerability and impacts of critical facilities at risk from a dam failure.

Officials with Oklahoma's conservation districts have said the state's dam control system is flooded with problems and desperately needs money to fix them. Efforts are underway throughout the state to fix the problems but it takes money that is not currently available.

## **Conclusions**

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Cleveland County has five dams rated as high hazard based on evaluation and ranking by the Oklahoma Water Resources Board. Although the dams are in good condition now they are deteriorating and may become a concern of major proportions in the future. There is already a good inspection program on these dams and the county plans for those to continue. Future projects to help the public become more aware of the potential of dam failure will be a step in mitigating the outcome of a breach in one of the dams in the future.

## **References**

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(OWRB) Oklahoma Water Resources Board (<http://www.owrb.ok.gov/maps/pmg/DMindex.html>)  
<http://www.ci.norman.ok.us/parks/george-m-sutton-wilderness-park>

## HAZARD PROFILE

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### Drought- Cleveland County

Drought is a persistent and abnormal moisture deficiency having adverse impacts on vegetation, animals or people. There are dozens of more specific drought definitions used around the world based on the lack of rain over various time periods or measured impacts such as reservoir levels or crop losses. Because of the various ways people measure drought, no one has produced an objective drought definition upon which everyone can agree.

**Drought Types:** There are three main ways to consider drought.

1. **Meteorological drought** is usually based on long-term precipitation departures from normal, though high temperatures often play a role.
2. **Hydrological drought** refers to deficiencies in surface and subsurface water supplies. It is measured as stream flow, and as lake, reservoir, and ground water levels.
3. **Agricultural drought** occurs when there isn't enough soil moisture to meet the needs of a specific crop at a particular time. Agricultural drought is typically evident after meteorological drought but before a hydrological drought.

When no rain or only a small amount of rain falls, soils can dry out and plants die. When rainfall is less than normal for several weeks, months, or years the flow of streams and rivers declines, water levels in lakes and reservoirs and even aquifers fall, causing the depth of water in wells to decrease. If dry weather persists and water supply problems develop, the dry period can become a drought. The first evidence of drought usually is seen in records of decreased rainfall.

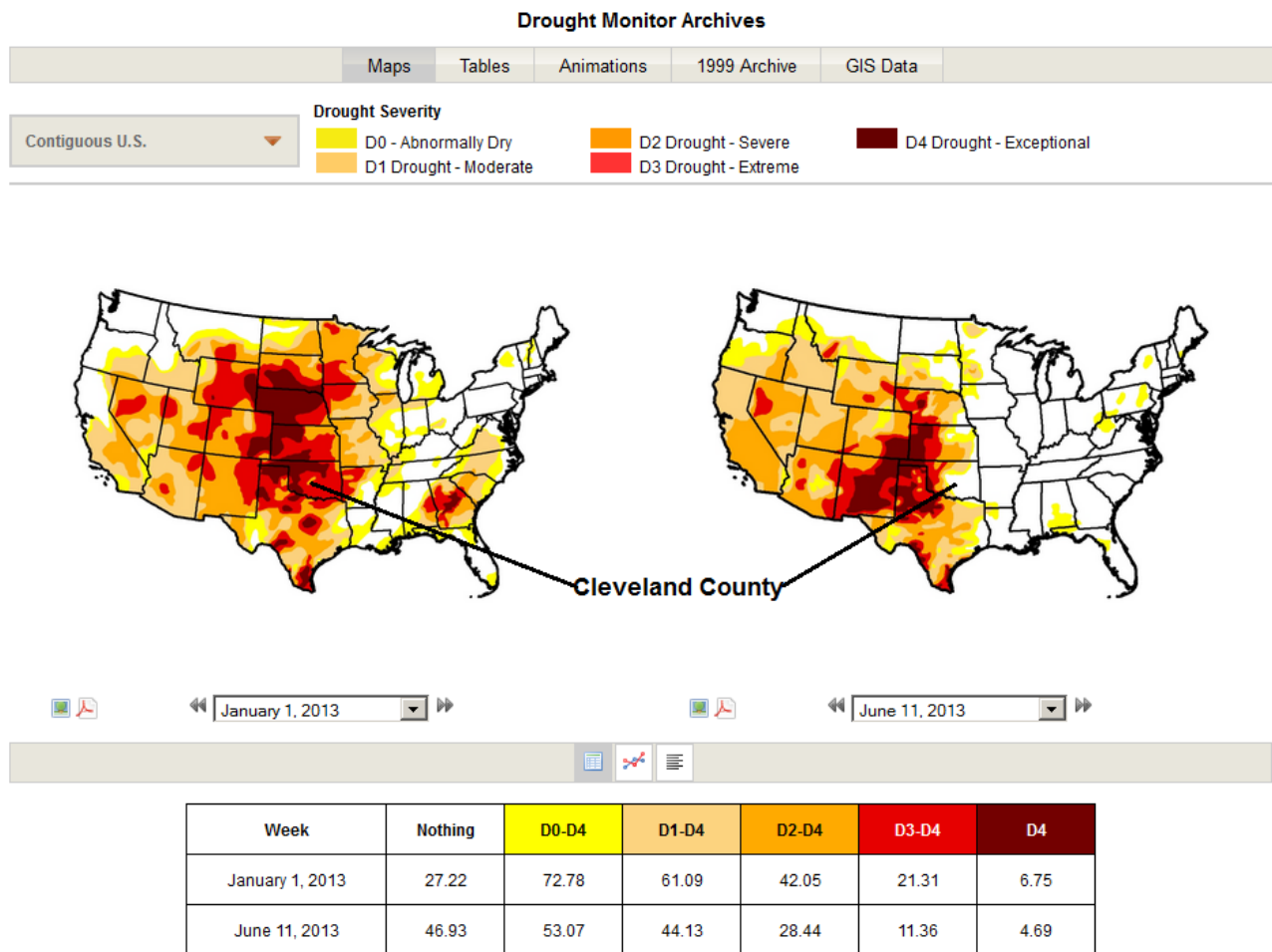
Within a short period of time, the amount of moisture in soils can begin to decrease. The effects of a drought on flow in streams and rivers or on water levels in lakes and reservoirs may not be noticed for several weeks or months. Water levels in wells may not reflect a shortage of rainfall for a year or more after the drought begins due to aquifer availability.

### Location

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All of Cleveland County, including the unincorporated communities and the incorporated communities, all public school districts, the University of Oklahoma and Moore/Norman Technology Center are susceptible to Drought.

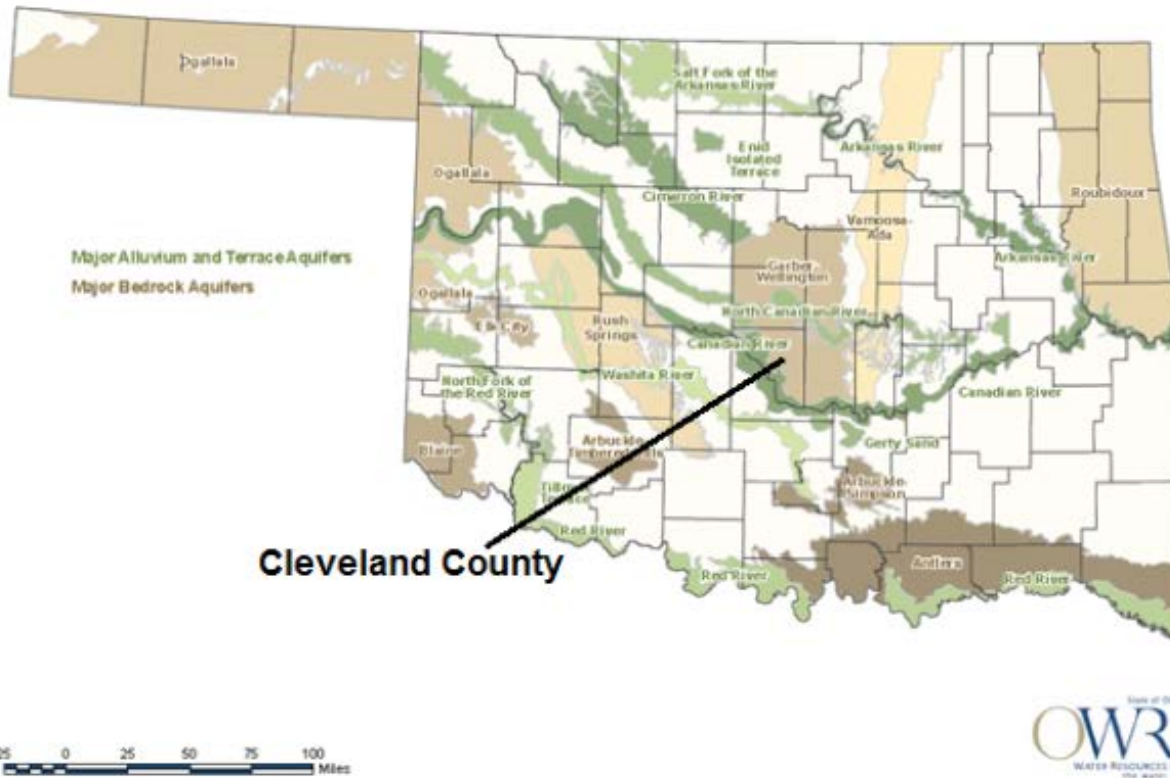
As of January 1, 2013, all of Oklahoma including Cleveland County including the unincorporated communities and the incorporated communities, all public school districts, the University of Oklahoma and Moore/Norman Technology Center was affected by Severe to Extreme Drought. Cleveland County including the unincorporated communities and the incorporated communities, all public school districts, the University of Oklahoma and Moore/Norman Technology Center



was embroiled in a Severe Drought that had lingered for almost a year. Drought conditions can intensify or decline quickly over a few months, as is shown on the June 11, 2013 map placing Cleveland County clear of Drought conditions. Heavy rains during May helped reduce the drought conditions rapidly.

During Drought periods much of Oklahoma is dependent on continued water supply through a series of aquifers throughout the state. A large part of Cleveland County is located over bedrock aquifers which provide a good source of water.

## Major Groundwater Aquifers of Oklahoma



The series of conservation dams in the county as well as a number of streams, rivers and private ponds, along with the aquifer provide adequate water during normal times. During severe drought conditions, however, streams and ponds dry up and water in the rivers and lakes get very low, even though there is a major aquifer following along the South Canadian River in Cleveland County and major bedrock aquifers under the rest of the county. Fortunately, major lakes in Cleveland County add to the availability of the aquifers for water resources.

### **Extent**

The **Palmer Drought Severity Index (PDSI)** was developed in 1965 as an index to “measure the departure of the moisture supply.” Palmer based his index on the supply and demand concept of the water balance equation, taking into account more than only the precipitation deficit at specific locations. The objective of the Palmer Drought Severity Index was to provide a



measurement of moisture conditions that were “standardized” so that comparisons using the Index could be made between locations and between months. The Palmer Index is based on precipitation and temperature. The Palmer Index can therefore be applied to any site for which sufficient precipitation and temperature data is available.

The Index varies roughly between -4.0 and +4.0. Weekly Palmer Index values are calculated for the Climate Divisions during every growing season and are on the internet from the Climate Prediction Center.

**Table 3-5**

<b>PDSI CLASSIFICATIONS FOR DRY/WET PERIODS</b>				
<b>4.00 or more</b>	<b>Extremely wet</b>		<b>-0.50 to -0.99</b>	<b>Incipient dry spell</b>
<b>3.00 to 3.99</b>	<b>Very wet</b>		<b>-1.00 to -1.99</b>	<b>Mild drought</b>
<b>2.00 to 2.99</b>	<b>Moderately wet</b>		<b>-2.00 to -2.99</b>	<b>Moderate drought</b>
<b>1.00 to 1.99</b>	<b>Slightly wet</b>		<b>-3.00 to -3.99</b>	<b>Severe drought</b>
<b>.050 to 0.99</b>	<b>Incipient wet spell</b>		<b>-4.00 to -4.99</b>	<b>Extreme drought</b>
<b>0.49 to - 0.49</b>	<b>Near normal</b>		Source: <a href="http://drought.unl.edu/whatis/induces.html">http://drought.unl.edu/whatis/induces.html</a>	

Cleveland County officials and members of the CCHMPT consider anything of the magnitude -2.00 or below on the Palmer Drought Index to be a significant drought situation. By the time the situation drops below -3.00, Cleveland County considers it to be a severe drought situation and appropriate actions need to be taken to conserve water.

## **Previous Occurrences**

According to NCDC records, there have been 24 drought events affecting Cleveland County from 1950 through 2013.

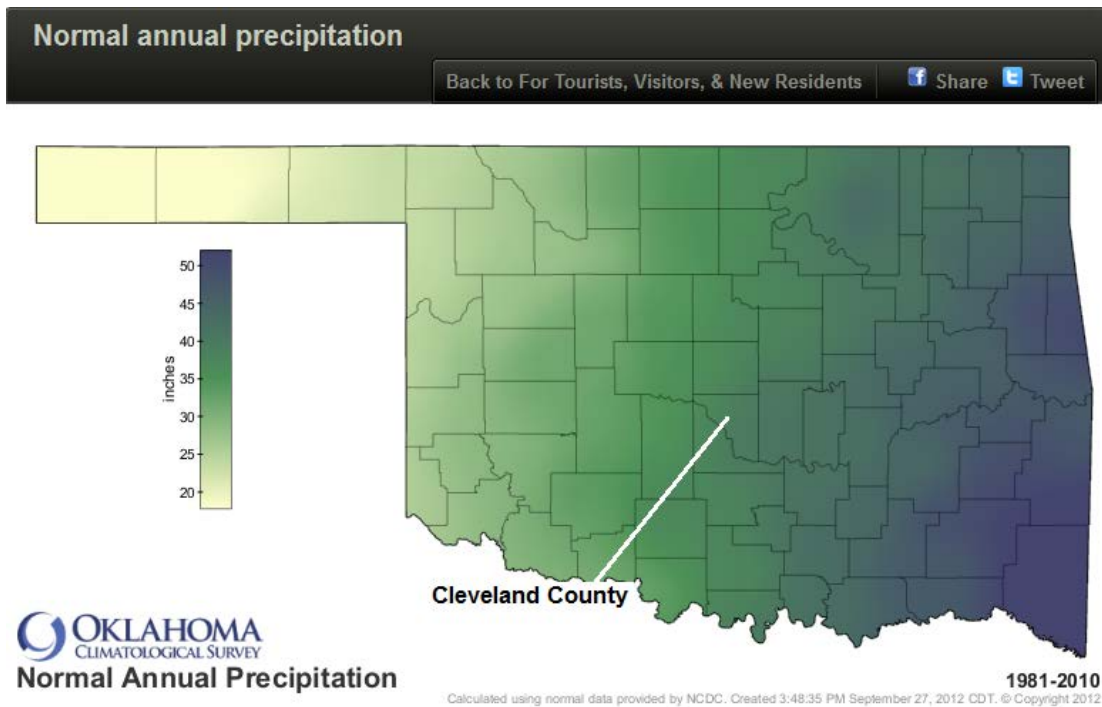
This is somewhat misleading, however, as there have only been six Drought years. The years 2000; 2001; 2005 and 2007 were years during which only one month was declared as a drought. During 2006-07, over twelve months were considered in a drought. In September 2011, Cleveland County was included in an area of D-4 or Exceptional Drought; however, by April 2013, the drought was beginning to recede. By the middle of June 2013 the drought condition was gone in Cleveland County.

Table 3-6

<b>CLEVELAND COUNTY DROUGHT EVENTS</b>	
<b>2007 through January 2013</b>	
<b>Date</b>	<b>Description</b>
<b>Jan. – Feb 2013</b>	D3 (extreme) drought continued through the month of January in Cleveland County with persistent dry conditions. D3 (extreme) drought conditions were present at the beginning of the month in Cleveland County, but had improved slightly to D2 (severe) drought by the end of the month due to several winter storms.
<b>July - Dec 2012</b>	As a mid-level ridge of high pressure built into the Southern Plains late in July, few opportunities for rain lead to expanding drought conditions across much of Oklahoma. Abnormally dry conditions were present at the beginning of the month, but D3 (extreme) drought developed by the end of the month with persistent dry conditions.
<b>Mar - Dec 2011</b>	Since Thanksgiving 2010, much of central and western Oklahoma has seen its driest precipitation totals since the 1920s and 30s. The lack of beneficial rainfall, combined with extreme high temperatures continued the drought that had plagued Oklahoma for several months. July 2011 was officially the hottest month on record locally and nationally. High temperatures were over 100 degrees for almost the entire month. Rainfall totals, especially for those over western and southern Oklahoma were little more than a trace. The dry vegetation contributed to several grass fires. Some municipalities had restricted water use, as water levels in area lakes have dropped to very low levels. The exact monetary loss for the crop loss cannot be determined, although it would probably be in the millions.
<b>01 Mar 2007</b>	The drought officially came to an end, thanks to heavy rainfall that fell during the latter half of the month. The drought went from a D2 (extreme) to a D1 (Moderate) on 3/22. Several rounds of heavy rainfall from the 26th through the 30th continued the trend, upgrading the status to D0 (Abnormally Dry).
<b>01 Feb 2007</b>	Severe (D2) drought conditions continued across much of the northern half of Oklahoma during the month of February. Normal rainfall that fell for February did nothing to help the drought, considering precipitation totals are not usually high in February. Water worries continue over this area with lake levels remaining low. Even with beneficial above normal rainfall earlier this year, and the slow improvement of lake levels over the last 3 months, many boat docks and ramps still remained on dry ground. Many people did not venture out on area lakes this month due to prolonged cold spells, so recreation in and around the lake were minimally affected. Water rationing is starting to be considered, although most lakes are still considered at safe levels for everyday living. The agriculture industry continued to be hit hard by the drought.
<b>01 Jan 2007</b>	Severe to extreme (D2-D3) drought conditions were seen however, much needed precipitation during the latter half of the month, mainly in some form of winter precipitation, allowed for these areas to improve to just severe conditions (D2). This also allowed for an improvement to areas farther south that were in D2 drought conditions during the month of December. The winter storm from the 12th through the 14th provided much needed precipitation to improve these areas to D1 or less.

## Probability of Future Events

Oklahoma has significant exposure to Drought. Cleveland County is vulnerable to drought although it generally does not experience the exceptional drought suffered in 2011. Based on the history of three droughts in the past 10 years, and 17 events over the last 61 years, the CCHMPT considered the probability of future events and concluded that drought is conceivable



in the future. The map from the National Weather Service shows the area in and around Cleveland County will need an additional 12-15 inches of precipitation to bring the PDI back to near "0" or normal status. As of May, 2012, that goal has been reached with significant rainfall during March, April, and the early part of May 2012. The Cleveland County Hazard Mitigation Planning Team believes that the entire county is equally at risk for drought and the probability of future events is "Likely."

## Vulnerability and Impact

Severe drought conditions cause many problems in Cleveland County. The greatest vulnerability to drought conditions is the population, both human and animal. The local jurisdictions (cities and towns) as well as the county are tasked with providing adequate water supply for consumption and health and sanitation purposes. Effects of drought are mostly felt by farmers and ranchers, through crop and livestock losses. This is important to the largest part

of Cleveland County, which is rural. Ponds and lakes lose large amounts of water, causing further losses of livestock. These losses cause financial hardship and loss for those farmers and ranchers in Cleveland County, and also impact the businesses from which they purchase goods or for which they provide produce and livestock. For Cleveland County, loss of tourism from low water in the lakes also becomes a problem. When lakes are too low for boating, fishing and skiing, recreational use drops and visitors wanting lake activities don't come to Cleveland County.

The public school districts can also be affected by drought, although not as much as other parts (municipalities) of the county. The public schools with students in agricultural programs such as 4-H and FFA have to deal with drought situations through their student projects. Some projects may be lost or severely damaged due to lack of rain. Schools buildings are not typically affected by drought. See Appendix C – Critical Facilities for more information on vulnerability and impacts of critical facilities at risk from drought.

Drought causes dry vegetation, resulting in wildland fires that cause loss of homes, businesses, outbuildings, and grazing lands during the drought period. Sometimes during a drought, dry, cracking soil can cause water lines to break, resulting in water loss to large segments of the population; highway pavement will sometimes break or ripple, causing hazardous driving conditions and forcing citizens and businesses to find alternate transportation routes. Water



sources tend to dry up or become so low water rationing is necessary. Cities often have to limit or completely stop lawn watering, car washing and other non-critical uses in order to have sufficient water for potential fire suppression needs and normal day to day critical needs. Unincorporated and small incorporated towns often make no special considerations unless their source of water is provided by larger jurisdictions. The City of Moore has had to convert from well water recently due to arsenic levels and now buys more than half of their water from Oklahoma City. When Oklahoma City goes into a rationing situation, the City of Moore is required by contract to do the same. They do not redistribute the water to other jurisdictions. By contract, they must be at or above whatever usage restrictions are in place in Oklahoma City. For instance, Moore can choose to restrict water usage when Oklahoma City is “normal”;

however, if Oklahoma City chooses to restrict usage, then the City of Moore has no option but to restrict to the degree (or greater) than Oklahoma City does.

Sustained drought conditions may also create extensive damage to water distribution systems based upon the expansion and contraction of soils. This damage can affect all of the jurisdictions and their inhabitants, whether they rely upon local well supply or municipal distribution systems.

Etowah and Slaughterville do not have a water systems. The residents rely on well water. Noble and Lexington have water systems but they do not supply water to other jurisdictions. The water wells in the Lexington area do not provide sufficient clean water even during non-drought conditions, but these wells are vulnerable to drought conditions and may not be able to provide adequate or potable water. The Town of Lexington is working with the Cleveland County Rural Water District No. 1 to persuade the Lexington Assessment and Reception Center (prison system) to build a new well system and share the water with Lexington residents. ***“Daryl Covey, chairman of the Cleveland County Water District, said a well on the prison’s grounds would tap into the Garber Wellington Aquifer and the water would be shared with nearby homes. . . . The system would provide water not only to the homes immediately south of the highway, but to the prison and the town of Lexington, as well.”*** ***“Lexington is expanding and the town’s two wells are shallow and water can be scarce during droughts, prompting the town to buy water from nearby Purcell, City Manager Charles McCown said.”*** *The Oklahoman, December 21, 2013.*

The City of Norman provides water only for the City of Norman, Moore-Norman Technology Center and the University of Oklahoma. They do not provide water to other jurisdictions at this time. Their water source is water wells and Lake Thunderbird.

## Conclusions

Cleveland County is susceptible to the effects of drought. The most recent drought in the county started in the fall of 2010 and continued into 2013. By the end of May 2013, the drought has been eased and is no longer a threat to any Cleveland County residents.

Based on past and current events, Cleveland County will experience drought in the future. Through projects specified later in this plan, it is possible to reduce the effects on the citizens and the land, allowing the citizens to hope to improve Cleveland County's response to drought.

## References

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U.S. Drought Monitor (<http://droughtmonitor.unl.edu/archive.html>)

National Climatic Data Center (<http://www.ncdc.noaa.gov/stormevents/>)

Oklahoma Climatological Survey (<http://climate.mesonet.org/>)

## HAZARD PROFILE

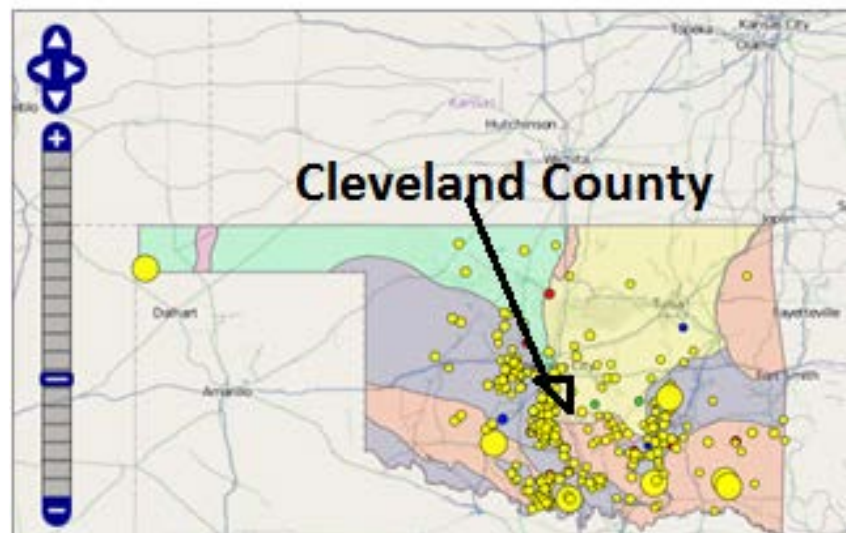
### Earthquake – Cleveland County

An earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock faults beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; but some earthquakes occur in the middle of plates. Earthquakes strike suddenly, without warning.

### Location

All of Cleveland County, including the unincorporated communities and the incorporated communities, all public school districts, the University of Oklahoma and Moore/Norman Technology Center are susceptible to the effects of an earthquake. The largest earthquake experienced in Oklahoma occurred on November 06, 2011 with a magnitude of 5.6. The Geological Survey said the earthquake was shallow, about three miles deep, and that the epicenter was four miles east of Sparks, located about 44 miles northeast of Oklahoma City. The quake followed smaller ones earlier in the day, including one at 2:12 a.m. with a preliminary magnitude of 4.7. Its epicenter was in Prague, about 50 miles east of Oklahoma City. The previous record earthquake was in 1952 when a 5.5 tremor occurred in Canadian County near El Reno. Generally, Cleveland County is not considered a high risk for damaging earthquakes; however, there are "felt" earthquakes from time to time. Even though most are not felt, the potential exists that if a larger earthquake occurred in Canadian County, or other in

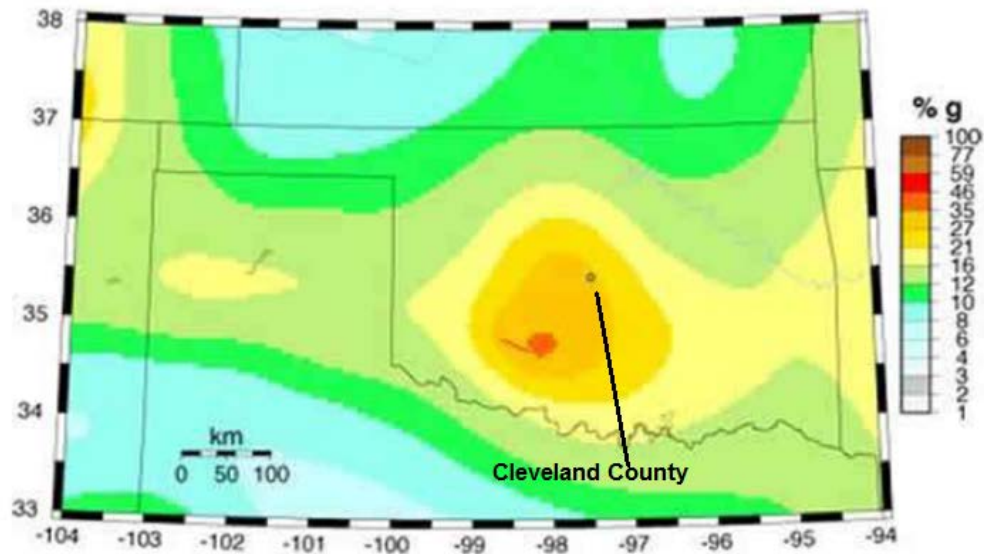
Oklahoma Earthquakes 2000-2007



Oklahoma County or Lincoln County or other locations, there could be minor damage result from that earthquake.

## Extent

There have been a series of “felt” earthquakes in Cleveland County in recent years. Cleveland County has had an increase of these earthquakes recently. It is bordered by Oklahoma County on the north, which has experienced a major increase of felt earthquakes in the northeast and east central parts of the county. Cleveland County falls within the USGS 20%g Peak Ground Acceleration (PGA) with 10% probability of exceedance in 50 years seismic map.



USGS hazard map for Oklahoma, showing the potential level of shaking associated with possible earthquakes in Oklahoma. This map is based on our current understanding of past earthquakes and where earthquakes are likely to occur in the future. This map shows the amount of shaking that has a 1 in 50 chance of occurring in the next 50 years. Shaking is expressed as a percentage of g, or the acceleration of gravity, with reds indicating more shaking than blues. The red line in southwestern Oklahoma represents the Meers fault, which has had a recent earthquake (1,200-1,300 years ago) rupture to the surface.

This PGA equates to a **Modified Mercalli Intensity (MMI)** scale of IV or V. This MMI intensity would indicate that a future earthquake affecting Cleveland County will cause only light to moderate ground shaking. This MMI scale of IV or V could result in building damages from none to very light. The impact of earthquake incidents would likely fall into the category of slight to moderate. Cleveland County officials including all incorporated jurisdictions, public schools, the Moore Norman Technology Center and Oklahoma University consider any earthquake activity above 4.8 on the Richter scale as a severe event and have decided they need to be prepared for such an event. Housing in the county is not built to “earthquake standards;”



however, structures on the University of Oklahoma campus are probably some of the strongest buildings in the county. The earthquakes in Cleveland County in the past have been slight with little or no damage reported in the county. An earthquake of magnitude 4.9 or greater in the future could cause damage.

**Table 3-7**

<b>Earthquake: Mercalli/Richter Scale Comparison</b>		
<b>Mercalli Scale</b>	<b>Richter Scale</b>	<b>Full Description</b>
<b>I.</b>	<b>0 – 1.9</b>	Not felt. Marginal and long period effects of large earthquakes.
<b>II.</b>	<b>2.0 -2.9</b>	Felt by persons at rest, on upper floors, or favorably placed.
<b>III.</b>	<b>3.0 – 3.9</b>	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
<b>IV.</b>	<b>4.0 - 4.3</b>	Hanging objects swing. Vibration like passing of heavy trucks. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink the upper range of IV, wooden walls and frame creak.
<b>V.</b>	<b>4.4 - 4.8</b>	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Pendulum clocks stop, start.
<b>VI.</b>	<b>4.9 - 5.4</b>	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Books, etc., off shelves. Pictures off walls. Furniture moved. Weak plaster and masonry D cracked. Small bells ring. Trees, bushes shaken.
<b>VII.</b>	<b>5.5 - 6.1</b>	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices. Some cracks in masonry C. Waves on ponds. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
<b>VIII.</b>	<b>6.2 - 6.5</b>	Steering of motor cars affected. Damage to masonry C; partial collapse. Some damage to masonry B. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
<b>IX.</b>	<b>6.6 - 6.9</b>	General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. (General damage to foundations.) Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
<b>X.</b>	<b>7.0 - 7.3</b>	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
<b>XI.</b>	<b>.7.4 - 8.1</b>	Rails bent greatly. Underground pipelines completely out of service.
<b>XII.</b>	<b>&gt; 8.1</b>	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.
<small>           Masonry A: Good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc.; designed to resist lateral forces.            Masonry B: Good workmanship and mortar; reinforced, but not designed in detail to resist lateral forces.            Masonry C: Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.            Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.         </small>		

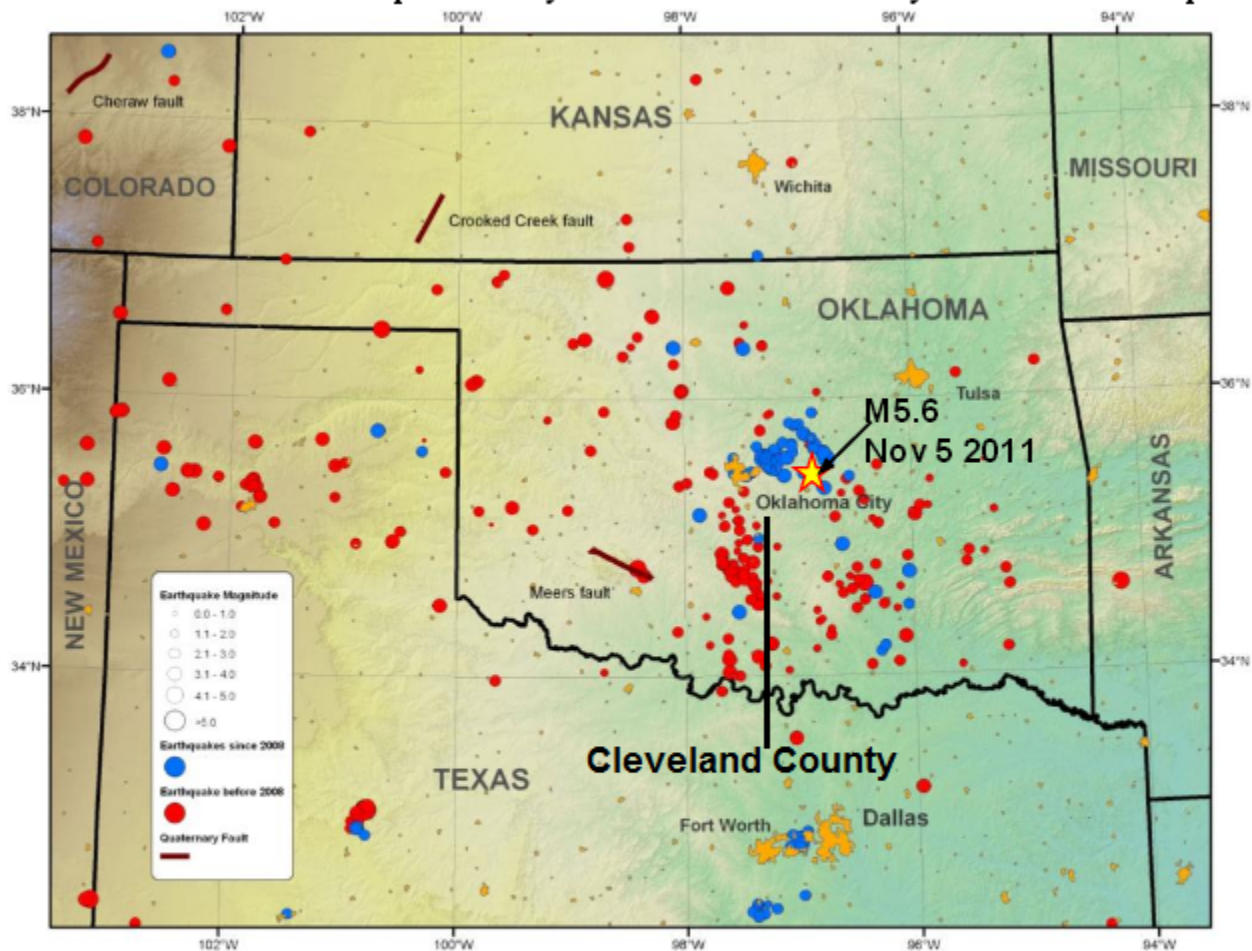
The Richter magnitude scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. This scale is usually the one referred to by news media when making public reports. The Richter Scale is the most familiar to the public. The table above shows how the Richter's original method to measure a seismogram for a magnitude estimate is used to determine damage levels.

## Previous Occurrences

The Oklahoma Geographical Survey Observatory near Leonard,, Oklahoma, provides a brief history of earthquake activity affecting Cleveland County. The epicenters were not in Cleveland County but in Lincoln County, approximately 50 miles north of Cleveland County.

**Table 3-8**

<b>CLEVELAND COUNTY EARTHQUAKE EVENTS 2007 - October 2013</b>			
Oklahoma Geological Survey Observatory			
<b>Date</b>	<b>Location</b>	<b>Magnitude</b>	<b>Damage</b>
<b>Apr 16, 2013</b>	Located in the Perkins OK area 76 miles NE of Norman. Depth = 2.3	4.7	None known
<b>Apr 20, 2012</b>	Rural area of 14000 block of Indian Hills Road in north Norman. Depth= 13.0	1.9	None known
<b>Oct 27, 2011</b>	Rural area in 12000 block of N. Banner Road in El Reno. Depth= 5.6	1.9	None known
<b>Nov 5, 2011</b>	Rural area in Lincoln County Depth = unk.	5.6	Minor damage in Cleveland County
<b>Mar 2, 2010</b>	Rural area in the 10121 W Britton Road in Yukon. Depth = 5.0	0.3	None known
<b>Jul 20, 2010</b>	Rural area 10 miles east of 3100 120th Ave SE Norman Depth= 3.35	0.8	None Known
<b>Oct 13, 2010</b>	1509 Westmore Drive in south Oklahoma City NW of Moore. Depth= 11.0	4.7 MMI - IV	Minor damages reported
<b>Oct 13, 2010</b>	West of Moore 13 miles in the Newcastle area Depth= 7.56	1.3	None Known
<b>Oct 13, 2010</b>	NW of Moore in SW Oklahoma City rural area. Depth= 4.54	2.0	None Known
<b>Oct 14, 2010</b>	NW of Moore in SW Oklahoma City rural area. Depth= 5.00	0.8	None Known
<b>Oct 18, 2010</b>	Rural area west of Norman Depth= 1.45	2.4	None Known
<b>Oct 19, 2010</b>	Rural area NW of Norman Depth= 3.98	3.0 MMI - III	None Known
<b>Jun 26, 2009</b>	Rural area of NW Oklahoma City near Piedmont Depth = 5.0	3.7	None Known
<b>Dec 1, 2008</b>	Rural area of NW Oklahoma City Depth = 5.0	2.7	None Known
<b>Feb 12, 2007</b>	1400 Clear Creek Rd in a primarily rural area in eastern Moore. Depth= 5.0	3.0	None Known



*Seismicity in the Oklahoma region since 1973. Events shown in red pre-date January 1, 2008, while events in blue post-date this time. Star shows the epicenter of the 5 November 2011 magnitude 5.6 earthquake. The locations of known Quaternary or younger faults are shown as red lines.*

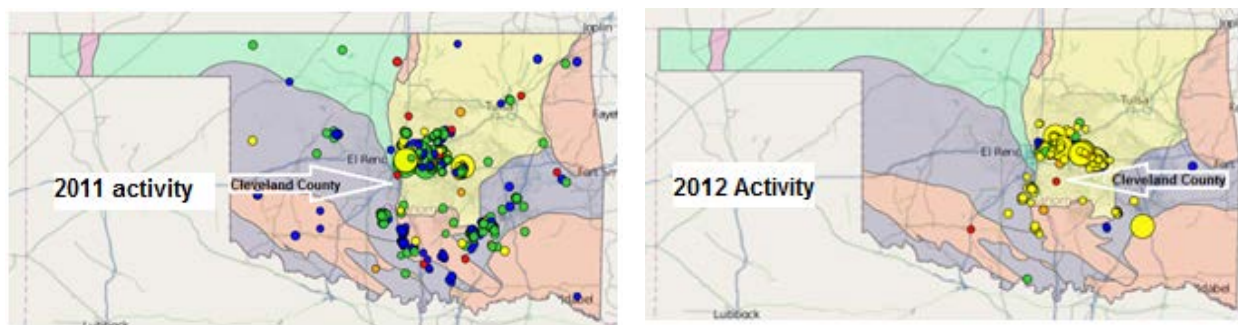
As previously described, a magnitude 4.7 earthquake occurred in Lincoln County, Oklahoma on November 5, 2011 at 2:12 AM. This turned out to be a foreshock to a much larger earthquake. The main shock (magnitude 5.6) occurred at 10:53 PM on November 6. The earthquakes occurred about six miles northwest of Prague and 5.2 miles southeast of Sparks. These earthquakes occurred very close to where a magnitude 4.3 earthquake occurred on February 27, 2010. From the location of the earthquake and the focal mechanism, it is most likely that this earthquake occurred on the Wilzetta fault also known as the Seminole Uplift. Although the epicenter was located in Lincoln County, these earthquakes were felt in Cleveland County as well as over a large part of Oklahoma.

## Probability of Future Events

The magnitude 4.7 and 5.6 earthquakes that occurred on November 5-6, 2011, were situated in a region located about 50 km east of Oklahoma City, Oklahoma, part of which lies within Cleveland County. Earthquakes are not unusual in Oklahoma, but they often are too small to be felt. From 1972-2008, about 2-6 earthquakes each year were recorded by the United States Geological Survey (USGS) National Earthquake Information Center; these earthquakes were scattered broadly across the east-central part of the state. In 2008, the rate of earthquakes began to rise, with over a dozen earthquakes occurring in the region east-northeast of Oklahoma City and southwest of Tulsa, Oklahoma. In 2009, the rate of seismicity continued to climb, with nearly 50 earthquakes recorded--many strong enough to be felt. This activity continued in 2010. The shallow magnitude 4.7 and 5.6 earthquakes of November 5, 2011, are the largest events recorded during this period of increased seismicity. Additionally, the magnitude 5.6 quake is the largest quake to hit Oklahoma in modern times.

There have been dozens of aftershocks recorded following the November 5, 2011 magnitude 5.6 earthquake and its magnitude 4.7 foreshock. These aftershocks continued for weeks but will likely decrease in frequency. Data from the Oklahoma Geological Survey and the USGS, along with immediate past history, indicates the potential of damaging earthquakes in Cleveland County is **“Likely.”**

There continues to be earthquake activity in the counties surrounding Cleveland County as shown in the following maps. Although citizens in Cleveland County sometimes feel the stronger earthquakes around them, very few have caused any damage.



## Vulnerability and Impact

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Buildings with foundations resting on unconsolidated landfill and other unstable soil, as well as trailers and homes not tied to their foundations, are at risk because they can be shaken off their mountings during even a modest earthquake, displacing the residents. Many residents in the smaller jurisdictions (such as Etowah, Lexington, Noble and Slaughterville) live in frame houses or mobile homes which could be more adversely affected by even slight tremors. Residents in larger towns are usually in newer, better built stronger homes but still are vulnerable to earthquakes although not to the extent of homes in the smaller communities. Because of the length of time that Moore and Norman have been in existence, these communities also have an abundance of smaller, less stable homes.

In addition to buildings with less stable soil and foundations, at greater risk are multi-level buildings in areas such as Moore, Norman, Lexington and Noble as well as campus structures. Many of the buildings, especially dormitories, of the University of Oklahoma, are multi-level and may experience greater damage from higher velocity earthquakes. Buildings and Moore-Norman Technology Center also contain glass frontings that are very susceptible to damage from earthquakes, which creates potential injuries for inhabitants.

Lexington, Moore, Noble and Norman have multiple school facilities which are multi story but are newer or high grade construction which has a greater propensity to withstand the effects of earthquake tremors.

Although unlikely in lightly felt earthquakes, roads and bridges can be damaged forcing motorists, including commercial drivers and school bus drivers to find alternate routes. Natural gas lines, water lines, pipelines, electric lines, even underground lines may be damaged causing loss of those services to the population. Not only is loss of service a factor, but there may be environmental concerns. Slightly larger felt earthquakes may cause damage to the inside structures existing in most homes throughout the county such as bookshelves, hot water tanks, pictures on walls, dishes and some equipment may suffer damage by falling. When larger earthquakes occur in populated area, deaths and injuries can occur in addition to more severe property damage. See Appendix C – Critical Facilities for more information on vulnerability and impacts of critical facilities at risk from an earthquake.

## Conclusion

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During the same period Cleveland County experienced felt earthquakes, January and February 2010, Oklahoma County experienced eight and twenty-six earthquakes respectively. This close proximity to Oklahoma County would likely indicate there will be more "felt" earthquakes in Cleveland County. Additional consideration is the fact that one of the largest earthquakes in Oklahoma (5.5) occurred in 1952 in Canadian County near El Reno which is only 49 miles from Norman. Also consider the fact that the largest earthquake in the State of Oklahoma in 2011 (5.6) occurred 60 miles away but was felt in Cleveland County.

## References

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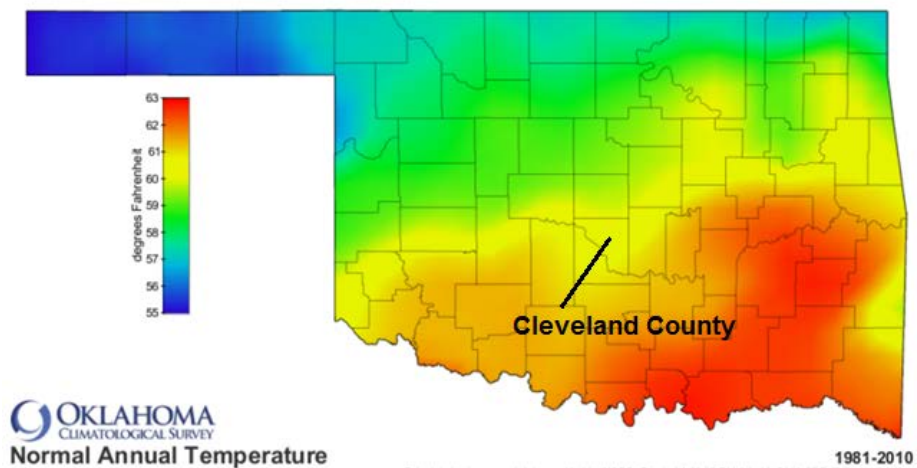
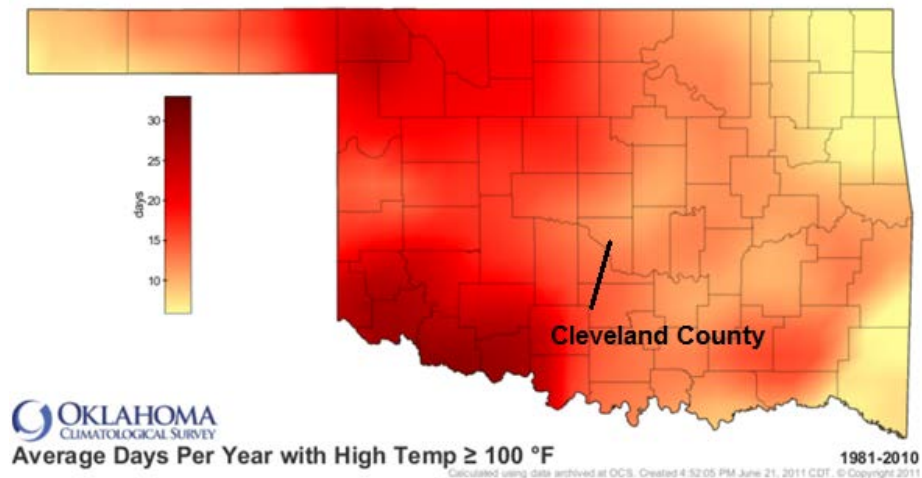
Oklahoma Geological Survey (<http://www.ogs.ou.edu/homepage.php>)  
US Geological Survey (<http://www.okgeosurvey1.gov/>)

# HAZARD PROFILE

## Extreme Heat – Cleveland County

Oklahoma is a part of the Southern Great Plains, and is prone to wide swings of temperature. Summertime temperatures routinely climb above the 100-degree mark. Temperatures that hover 10 degrees or more above the average high temperature for the area and lasts for several weeks are defined as extreme heat. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a “dome” of high atmospheric pressure traps hazy, damp air near the ground.

The hottest period of the Oklahoma summer extends from mid-July through mid-August. Overall, August, the third and final month of the climatological summer, is Oklahoma's second hottest, fifth driest, and least windy month. The normal statewide monthly temperature is 80.9 degrees Fahrenheit (F). Cleveland County's average maximum temperature according to the Oklahoma Climatological Survey is 72 degrees with the highest recorded temperature occurring in Guthrie (Logan County) on August 10, 1936 when temperatures reached 116 degrees F.



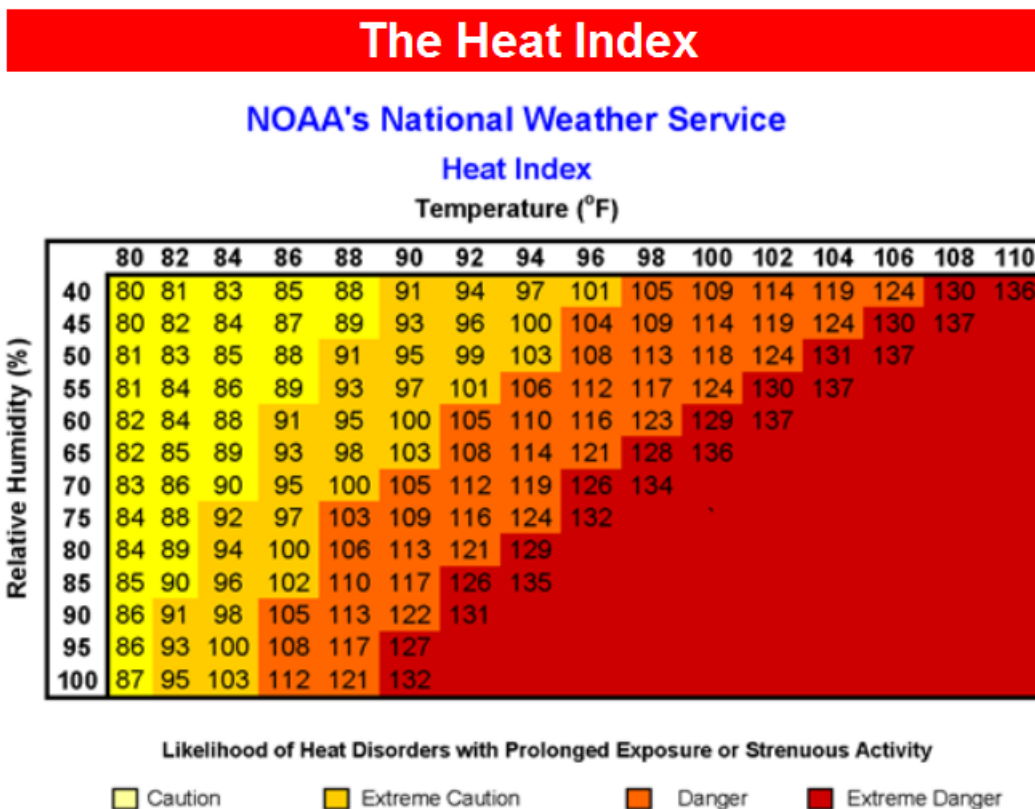
Cleveland County has an annual average temperature of 61 degrees F with only 10 - 15 days during the year experiencing temperatures over 100°, usually during July and August. The preceding maps show the variation between normal temperatures (upper map) and the high temperatures in the summer over 100 degrees (lower map).

## Location

All of Cleveland County including the unincorporated communities and the incorporated communities, all public school districts, the University of Oklahoma and Moore/Norman Technology Center are all susceptible to the effects of extreme heat. The temperatures experienced in Cleveland County do not compare to those counties in western Oklahoma that experience 35 – 40 days of temperatures over 100 degrees. Cleveland County however has a higher humidity because of its location in relation to the Gulf of Mexico, and it has an annual average of 75 days with temperatures above 90 degrees.

## Extent

It is often extremely hot and humid during the summer in Oklahoma including Cleveland County. Extended periods of higher than normal temperatures could result in the heat becoming a hazard to life and property.





**The Heat Index** is how the heat and humidity in the air combine to make individuals feel. Higher humidity plus higher temperatures often combine to make us feel a superficial temperature that is higher than the actual air temperature.

The National Weather Service in Norman will issue special advisories/warnings during times of High Heat Indices as follows:

**Heat Advisory** – Issued when the Heat Index will be equal to or greater than 100 degrees Fahrenheit, but less than 105 degrees Fahrenheit.

**Excessive Heat Warning** – when heat indices will attain or exceed 105 degrees Fahrenheit.

**Excessive Heat Watch** – a possibility exists that Excessive Heat Warning criteria may be met at longer ranges (12 – 48 hours out)

Cleveland County, including all incorporated jurisdictions, public schools, the Moore Norman Technology Center and Oklahoma University, considers any extended period with heat indices above 90 degrees as a severe event and cause for concern with periodic check-ups on the elderly and other at risk populations. An excessive heat warning is considered a major event and all possible preventive measures should be extended to citizens such as cooling facilities.

## Previous Occurrences

According to NCDC, Cleveland County has had only two major extreme heat events over the last 10 years with excessively high temperatures causing significant problems for citizens and agriculture, though the record-setting temperatures of 2012 have not yet been recorded and, therefore, are not available at the time of this writing. Information listed below for 2012 is based on Oklahoma Mesonet data through the Oklahoma Climatological Survey (OCS). Damages listed indicate damage amounts from all of the affected counties in Oklahoma, not only from Cleveland County.

**Table 3-10**

CLEVELAND COUNTY EXTREME HEAT EVENTS 2001-APRIL 2013 DATA FROM NATIONAL CLIMATIC DATA CENTER AND OKLAHOMA CLIMATOLOGICAL SURVEY	
DATE	EVENT DESCRIPTION
2011-	According to data from the Oklahoma Mesonet, the statewide average temperature finished at 79.2 degrees to rank as the 19 <sup>th</sup> warmest June on record, 2.7 degrees above normal. Statewide average records date back to 1895. June's warmth follows a pattern that began over two years ago

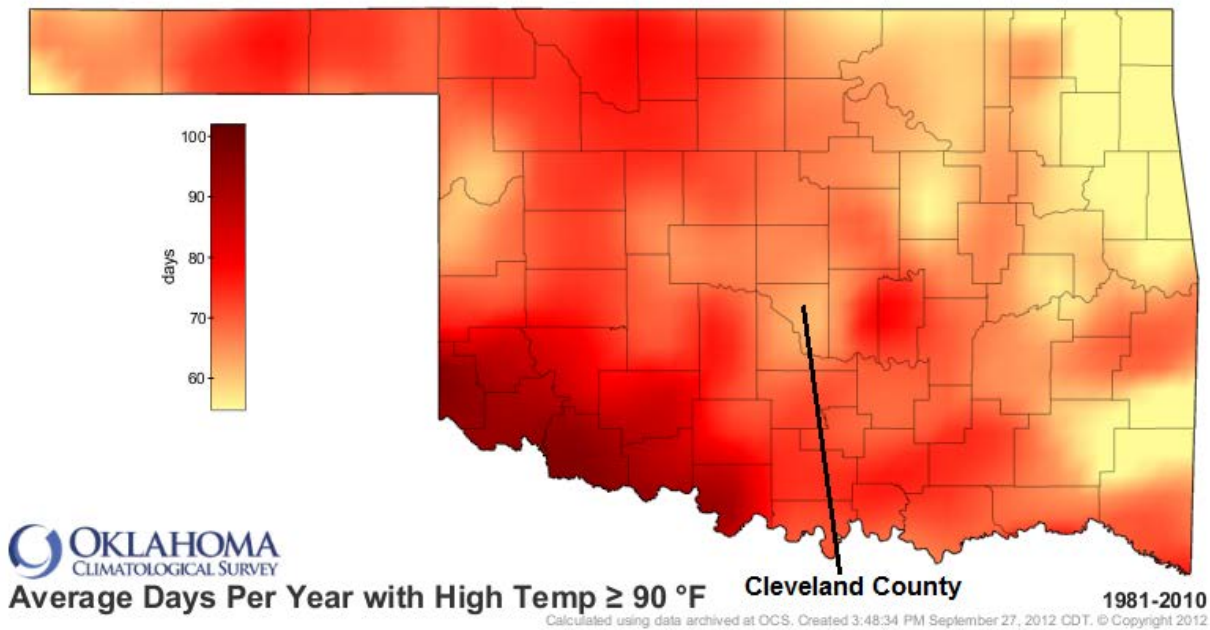
CLEVELAND COUNTY EXTREME HEAT EVENTS 2001-APRIL 2013 DATA FROM NATIONAL CLIMATIC DATA CENTER AND OKLAHOMA CLIMATOLOGICAL SURVEY	
DATE	EVENT DESCRIPTION
	with 22 out of the last 27 months being warmer than normal. The January-June statewide average entered the record books at 60.1 degrees, 4.9 degrees above normal. That obliterates the previous record mark of 58.9 degrees from the same period in 2006.
<b>16 Jul 2006 - 13 Aug 2006</b>	The triple digit heat that began at the end of July continued through at least the first half of August across Oklahoma. Overnight lows also remained high with temperatures only falling into the upper 70s to low 80s most nights. The heat caused a strain on several power grids causing local authorities to ask for people to minimize the consumption of power during the hottest parts of the day to prevent brown outs.
<b>04 Jul 2001 - 31 Jul 2001</b>	An extended period of excessive heat affected all of western and central Oklahoma in July. Daily mean temperatures ranged from the mid-80s to near 90 degrees, which is four to five degrees above normal. Most areas regularly experienced high temperatures at or above 100 degrees. In addition to the excessive heat, rainfall averaged about one-third of normal.

## Probability of Future Events

Because extreme heat is a hazard for all Oklahomans, efforts are being made throughout the state to mitigate the effects of the extreme heat hazard. The National Weather Service is now issuing Excessive Heat Warnings by county through the NOAA Weather Radio system. They are issued when the combined effect of high temperatures and high humidities result in daytime heat indices greater than or equal to 105° F and nighttime ambient temperatures greater than or equal to 80 degrees F that will persist for two days or longer. Based upon past history and public input, in Cleveland County and all participating jurisdictions, the probability of a future extreme heat event is **“Highly Likely.”**

<b>Cleveland County Temperatures:</b>
Average Annual: 61 degrees
Average Maximum: 73 degrees
Average Minimum: 49 degrees
Highest: 116 degrees (Norman, August 10, 1936)
Days of 90 Degrees or Higher: 78





*(Map is the latest available)*

## Vulnerability and Impact

Cleveland County has a significant extreme heat hazard due to its climate. Summers are hot and humid with daytime highs in the upper 80's to the mid-90s. Summers generally experience less than five inches of rain in July and August and the first of September.

Electrical power supplies throughout the county are often affected due to high use by the population which causes power “brownouts” or outages. Some elderly citizens either do not have air conditioners or fans that work or do not use them because of electrical costs and they are often the victims of the severe temperatures. The handicapped and very young are also common victims of extreme heat. People working outside are exposed to the extreme temperatures and need to know how to take care of themselves to prevent heat exhaustion and heat stroke. Public education programs can help tremendously to reduce the effects of heat and humidity.

Roads are often affected by extreme heat. Some older asphalt roads tend to “melt” or get soft with continued heat. Concrete roads “explode” and crack due to the heat. Many of these roads are used by school buses, mail carriers and emergency responders. The damaged roads often create hazardous conditions for finding alternate transportation routes. See Appendix C – Critical



Facilities for more information on vulnerability and impacts of critical facilities at risk from extreme heat.

Agriculture is an important industry in Cleveland County, especially cattle and horse ranching. Extreme heat can be extremely damaging to various crops during the summer months. Livestock and livestock products make up a significant part of Cleveland County's annual revenue; however, the industry suffers when grass dries up and ranchers are unable to properly feed their livestock. Large economic losses are likely. Beef producers particularly will be more concerned with the lack of moisture, short forage supplies, the distance they have to go to find hay, and the price they have to pay when they find it.



They are concerned about the impact the high daily temperature and humidity have on their cattle.

Cattle have an upper critical temperature that is 20 degrees cooler than humans. At 82 degrees and 75% humidity, some humans may start to feel a little uncomfortable, but most cattle will be in the danger zone for heat stress. At 90 degrees and 65% humidity, cattle are at extreme risk for heat stress. The humidity makes it difficult for cattle to dissipate body heat at these temperatures.

## Conclusion

As has been stated earlier in this plan, Cleveland County has a potential extreme heat hazard



due to its climate. Heavy use of the power grid can cause major power outages in any of the communities in Cleveland County causing hazardous conditions particularly for elderly or other special populations. The effects of extreme heat upon the human population in Cleveland County can be devastating if it lasts very long.

Water for normal uses may be rationed to leave adequate water supply for firefighting or other critical services. Some businesses can also be adversely affected by water rationing which can also negatively affect the economy in Cleveland County.

Agriculture is an important industry in Cleveland County and extreme heat can be devastating to that industry if it is for a longer than normal period. Additional planning toward mitigation efforts can greatly reduce these concerns.

## References

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FEMA - Federal Emergency Management Agency (<http://www.fema.gov/disasters>)

NWS - National Weather Service – Norman (<http://www.srh.noaa.gov/oun/>)

OCS - Oklahoma Climatological Survey (<http://climate.mesonet.org/>)

## HAZARD PROFILE

### Flood – Unincorporated Cleveland County, Lexington, Moore, Noble, Norman, Slaughterville

Flood is defined as an overflow or inundation that comes from a river or other body of water and causes or threatens damage. Floods are usually a result of heavy, slow moving thunderstorms or rains extending over a long period of time. Floods can also occur through a dam failure or over-topping. Flash-flooding is a short term water inundation usually as a result of storm water drainage or low water crossings on roadways.

Fortunately, most of the known floodplains in the United States have been mapped by FEMA, which administers the National Flood Insurance Program (NFIP). When a flood study is completed by the NFIP, the information and maps are assembled into a Flood Insurance Study (FIS). An FIS is a compilation and presentation of flood risk data for specific water courses, lakes, and coastal flood hazard areas within a community and includes causes of flooding. The FIS report and associated maps delineate Special Flood Hazard Areas (SFHAs), designate flood risk zones, and establish base flood elevations (BFEs), based on the flood that has a 1% chance of occurring annually, or the 100-year flood. Flood Insurance Rate Maps (FIRMs) for this area can be viewed in Appendix B hereto.



Flooding can take many forms including river floods (riverine) and creeks. Riverine flooding occurs when excessive rainfall from areas upstream of the problem area exerts pressure on rivers or drainage channels. Riverine flooding is usually a gradual process with warning time from several hours to several days in many cases. River water surface elevations exceed the natural banks of the channel inundating the areas within the floodplain or beyond. Riverine flooding has the tendency to remain in flood stage for a longer period of time than other types of flood hazards. In many cases, riverine flooding may cause greater flood losses due to the length

of time structures are inundated, the velocity and depth of the water, and the debris associated with the fast moving water.

## Location

Included in this section of the plan are Unincorporated Cleveland County and the communities of Lexington; Moore, Noble, Norman, and Slaughterville. BureauNet, the FEMA NFIP database of flood claims, identified Cleveland County with three repetitive loss properties, two in Lexington, three in Moore and seven in Norman. The seven properties in the City of Norman represent the largest number of repetitive loss properties in Cleveland County. Of those seven, only three remain in the floodplain. Three were mitigated through city drainage projects and one house was demolished.

Lexington has two non-residential repetitive loss properties, with one property loss occurring in May, 1992. The other loss occurred in 2007. No action is being taken to mitigate either of these properties. The City of Moore has three properties, all of which are contiguous and owned by the same business. These properties are still located in the floodplain. The county has three single-family unmitigated properties; the original claims on these properties were made in 1979, 1987 and 1995. The Towns of Etowah and Slaughterville and the City of Noble have no repetitive loss properties. The following table documents the types of structures, their related flood zones and current status.

Community Name	Mitigated?	Insured?	Dt of Loss	Occupancy	Zone	Firm
CLEVELAND COUNTY*	YES	NO	08/18/1995	SINGLE FMLY	A	N
CLEVELAND COUNTY*	YES	NO	06/09/1995	NON RESIDNT	A	N
CLEVELAND COUNTY*	YES	NO	05/15/1995	SINGLE FMLY	A	N
LEXINGTON, CITY OF	NO	NO	05/11/1992	NON RESIDNT	A02	N
LEXINGTON, CITY OF	NO	NO	12/11/2007	NON RESIDNT	AE	N
MOORE, CITY OF	NO	NO	05/27/1987	NON RESIDNT	A	N
MOORE, CITY OF	NO	SDF	08/11/2008	NON RESIDNT	AE	N
MOORE, CITY OF	NO	NO	09/29/1986	NON RESIDNT	A	N
NORMAN,CITY OF	NO	NO	06/03/1989	2-4 FAMILY	C	N
NORMAN,CITY OF	NO	NO	06/19/1993	2-4 FAMILY	C	N
NORMAN,CITY OF	NO	YES	08/19/2007	SINGLE FMLY	AE	N
NORMAN,CITY OF	NO	YES	11/10/1992	SINGLE FMLY	AE	N
NORMAN,CITY OF	NO	NO	06/09/1995	NON RESIDNT	C	N
NORMAN,CITY OF	NO	YES	05/27/1987	SINGLE FMLY	B	N
NORMAN,CITY OF	NO	NO	09/19/1979	SINGLE FMLY	C	N

The school campuses in Cleveland County including the Moore-Norman Technology Center and the University of Oklahoma have no flood risk nor are they located within the FEMA recognized special flood hazard area. Maps showing the school campuses and their location in proximity to the recognized special flood hazard area are provided in Appendix B.

## **Extent**

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There are several low water bridges in the county that frequently flood whenever 1-2 inches of rain fall in a few hours, which usually occurs with overnight rainfall. When these bridges become impassable from flood waters, they isolate the rural residents from vital services, including emergency services.

Flood events where vehicles stall and require swift water rescues create a problem for Cleveland County officials and first responders. At the point where water starts entering homes, flooding is considered a severe event. Water entering homes creates serious problems whether it is 1/2 inch or three inches. Severe damage to floors, walls and contents is difficult to repair and repeated flooding often causes mold and long term damages. County and city officials and members of the CCHMPT consider rainfall of one inch per hour a minor severity, and anything over three inches per hour a major event that can cause severe flooding problems from drainage.

## **Previous Occurrences**

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Cleveland County has had past occurrences of flooding, both riverine and flash-flooding. The following table lists flood events over the last 10 years based on information from the Cleveland County Emergency Management Department and NCDC. Communities affected by flooding and/or flash-flooding in Cleveland County are Lexington, Moore, Noble, Norman, and Slaughterville. Other jurisdictions indicated flooding is not a significant hazard at this time.



**TABLE 3-11 CLEVELAND COUNTY FLOOD EVENTS  
2001 - APRIL 2013**

SOURCE: National Climate And Data Center  
National Weather Service - Norman

DATE	LOCATION	DESCRIPTION
06/14/2010	Moore, Slaughterville	<b>Flash Flood</b> - Another in a series of significant weather events affected parts of Oklahoma on June 14th, this time in the form of significant flooding. The event began late on June 13th, as thunderstorms developed over northwest Oklahoma. The thunderstorms developed ahead of a slow moving cold front that was located over southwest Kansas into the northern Texas panhandle. A large outflow boundary also extended eastward. The thunderstorms became more numerous as they moved along the outflow boundary. The first round of significant rainfall impacted central Oklahoma around 3 am. This round moved east before another, longer lived, thunderstorm complex developed right over the Oklahoma City metro area. The outflow boundary was located south of Interstate 40, and the low-level jet transported warm and very humid air north of the boundary, where it was released into thunderstorm updrafts, creating very heavy, tropical rainfall. Rainfall rates averaged one to two inches per hour, with some thunderstorm bands producing rates near three inches per hour. Roadways became raging rivers, and ponds, creeks, and rivers more than overflowed their banks. The persistent heavy rainfall finally tapered off around noon.
09/13/2010	Lake Thunderbird dam to Slaughterville.	<b>Flash Flood</b> - Thunderstorms developed during the morning hours, with some flooding reported over parts of Cleveland county. A couple of highways had to be closed near Etowah due to high water, but were opened back up a few hours later. Later that afternoon, strong heating, a very moist air mass, and support from a weak eastward moving mid-level disturbance contributed to the development of additional thunderstorms over Oklahoma. These slow-moving thunderstorms produced very heavy rain and gusty winds. Most of the gusts reported were less than 50 mph. However, a few gusts exceeded severe limits, with gusts of 60 to 70 mph reported. Minor damage was reported in Garfield county. The thunderstorms decreased in intensity and coverage with the loss of daytime heating.
04/10/2008	Cleveland County, Norman, Moore, Slaughterville	<b>Flood</b> - Severe thunderstorms developed over the southeast half of Oklahoma and moved northeast through the evening and overnight hours. The storms congealed into a larger complex with embedded severe storms later in the evening. Heavy rain became another concern as the night progressed. Numerous locations picked up several inches of rain by the 10th, with several reports of flash flooding. Several streets in Norman were closed due to water over the roadways. Some of the water was reportedly up to the middle of a car door. Other roads around the county were also closed due to high water running over top of them. \$5,000 damages were estimated.
09/10/2007	Cleveland County, Norman, Slaughterville	<b>Flood</b> - A weak cold front was located from northeast to southwest, draped over Oklahoma county during the early morning hours. Lift associated with the low-level jet and rich, abundant moisture allowed for very heavy rain to develop over parts of Oklahoma and Cleveland counties. Individual thunderstorms moved off to the east, but additional development to the west resulted in storms training over the same

**TABLE 3-11 CLEVELAND COUNTY FLOOD EVENTS  
2001 - APRIL 2013**

SOURCE: National Climate And Data Center  
National Weather Service - Norman

DATE	LOCATION	DESCRIPTION
		<p>areas. As a result, a narrow band of two to four inches of rain fell over a three to four hour time period. Localized areas received over six inches of rainfall. Cow Creek overflowed its banks, flowing over the roadway in NW Cleveland county. Several cars stalled while attempting to drive through the high water. The roadway from 104th to 134th Streets and Macarthur Avenue flooded as a result. Several cars stalled while attempting to drive through the high water. Water also entered a home at SW 199th and Rockwell. <b>\$20,000.00 damages were estimated.</b></p>
<b>08/19/2007</b>	Norman	<p><b>Flash Flood</b> - Tropical Storm Erin, the fifth named storm of the 2007 Atlantic Hurricane season, developed quickly over the northeast Gulf of Mexico on the 15th, before moving onshore during the morning hours of the 16th. Erin moved onshore near Lamar, TX as a weak tropical storm, but was quickly downgraded to a tropical depression as it moved over land. As the evening progressed, a strong low-level jet developed, with additional thunderstorms developing over southwest and central Oklahoma. Remarkably, the center of the tropical depression strengthened between 1 and 7 AM, with a compact area of sustained winds of 35 to 45 MPH concentrated around the center of the depression. Wind gusts of 50 to 80 mph were also reported over parts of central Oklahoma. at this time. In addition to very strong winds, rainfall rates of over three inches per hour were common, with significant flash flooding reported in numerous counties. Rainfall amounts exceeded five inches over a large area, with some locations receiving eight to ten inches. Dozens of people were rescued by boat and helicopter as numerous homes and businesses quickly took on water. A couple of homes were flooded on Lahoma street. Numerous streets were closed due to high water. One road collapsed due to the persistent rainfall. One small bridge was washed out and another bridge sustained minor damage. \$20,000.00 damages were estimated.</p>
<b>07/10/2007</b>	Norman, Slaughterville	<p><b>Flood</b> - A boundary moved southeast into Oklahoma during the afternoon hours of the 9th. An upper level wave accompanied this front, and combined with afternoon heating helping severe thunderstorms to develop during the afternoon and overnight hours. Thunderstorms also developed on the many outflow boundaries that were created throughout the event. Hail, high winds and flash flooding were reported. Several roads were closed due to flash flooding, including near the intersection of Franklin and Sooner Roads, Rock Creek and Tecumseh Roads, between 60th and 72nd Streets, and near the intersection of 132nd Street and Cedar Lane in southeast Norman. Several other roads around town were also under water. High water also impacted homes. Numerous cars were stalled in the high water. Several businesses had water in them as well. Continuous rounds of heavy rainfall proved more than the Reynolds Lake earthen dam could take. A ten-inch pipe in place to help control rising lake levels was not near enough for the rapid increase in the lake level. A 25 to 30 foot diameter and 15 foot deep portion of the dam collapsed, sending water rushing out and over Rock Creek and Alameda Roads. The roads were closed for a couple of days as a result until the water levels that were once over a foot deep receded. <b>\$15,000.00 damages are estimated.</b></p>

**TABLE 3-11 CLEVELAND COUNTY FLOOD EVENTS**  
**2001 - APRIL 2013**  
 SOURCE: National Climate And Data Center  
 National Weather Service - Norman

DATE	LOCATION	DESCRIPTION
05/07/2007	Cleveland County, Lexington, Slaughterville	<b>Flood - Flash Flooding</b> - Thunderstorms began early in the morning on the 6th, continued most of the day and into the early morning hours of the 7th. Moisture was in abundance that day, along with very strong instability. Wind shear remained quite favorable for supercell thunderstorms. Most of the thunderstorms began over the northwest half of Oklahoma, but moved south and east into the morning and afternoon hours of the 7th. Large hail, high winds, and tornados were common, with flooding rains also present. One small supercell thunderstorm developed east of the main thunderstorm area during the evening and produced two small tornadoes as it moved to the north. Two other tornadoes occurred in the early morning hours as thunderstorms moving northeast into central Oklahoma interacted with gust front boundaries from previous thunderstorms. In <b>Lexington</b> - a small creek was out of its banks at Center and 1st Streets. Water was rising into homes. <b>Moore</b> - Street flooded at 34th and Interstate 35. No damage reported <b>Norman</b> - Three water rescues were made due to water over rising near the top of the cars. Three minor injuries were reported. \$15,000.00 damages were estimated.
06/10/2003	Moore	<b>Flash Flood</b> - Water two feet deep was across Southwest 164th Street. On street water one foot deep was reported covering the road. No damage reported.
6/27/2001	Stella	<b>Flash Flood</b> - No known damage - Numerous roads near the Cleveland/Oklahoma County line were closed due to high water.
04/30/2000	Moore	<b>Flash Flood</b> - Slow moving thunderstorms formed over portions of western and central Oklahoma during the late morning of the 30th and continued through mid-evening. These storms were responsible for isolated areas of wind damage, large hail, lightning damage, and some flooding. No damage reported
10/20/2000	Moore	<b>Flash Flood</b> - Significant flash flooding and 6 tornadoes, mostly small, weak and short-lived, developed on the 22nd, across a 35 mile wide band from near Frederick in southwest Oklahoma northeastward to near Chandler in central Oklahoma. Rainfall amounts in this band averaged 4 to 8 inches. Record-like flooding developed in some areas. Several roads were closed due to flooding on the east side of Moore, including portions of 34th Street and 12th Avenue. No damage reported.

**THE CITY OF LEXINGTON** is susceptible to minor flooding primarily due to flash flooding in low lying areas although there has been occasional flooding along a small creek on the north side of town. School buildings were not affected, but Lexington Schools have occasionally had to cancel school due to flooded roadways on bus routes.



Flash-flood area in Lexington at 1<sup>st</sup> and Center



NE Center Street at 1<sup>st</sup> in Lexington

The primary problem with flooding in the City of Lexington involves flash-flooding where the street drainage system is not adequate to get rid of the runoff from surrounding terrain when rains are exceptionally heavy. Lexington is a flat terrain which increases the drainage problems. See Table 3-11 for list of previous events.

### Probability of Future Events - Lexington

Because Lexington has a flat terrain, runoff is limited and slowed, but sometimes this causes flash-flood events. Based on past history, however, and input from the city and school district officials, the potential of flooding in the City of Lexington is still considered **“Possible.”**

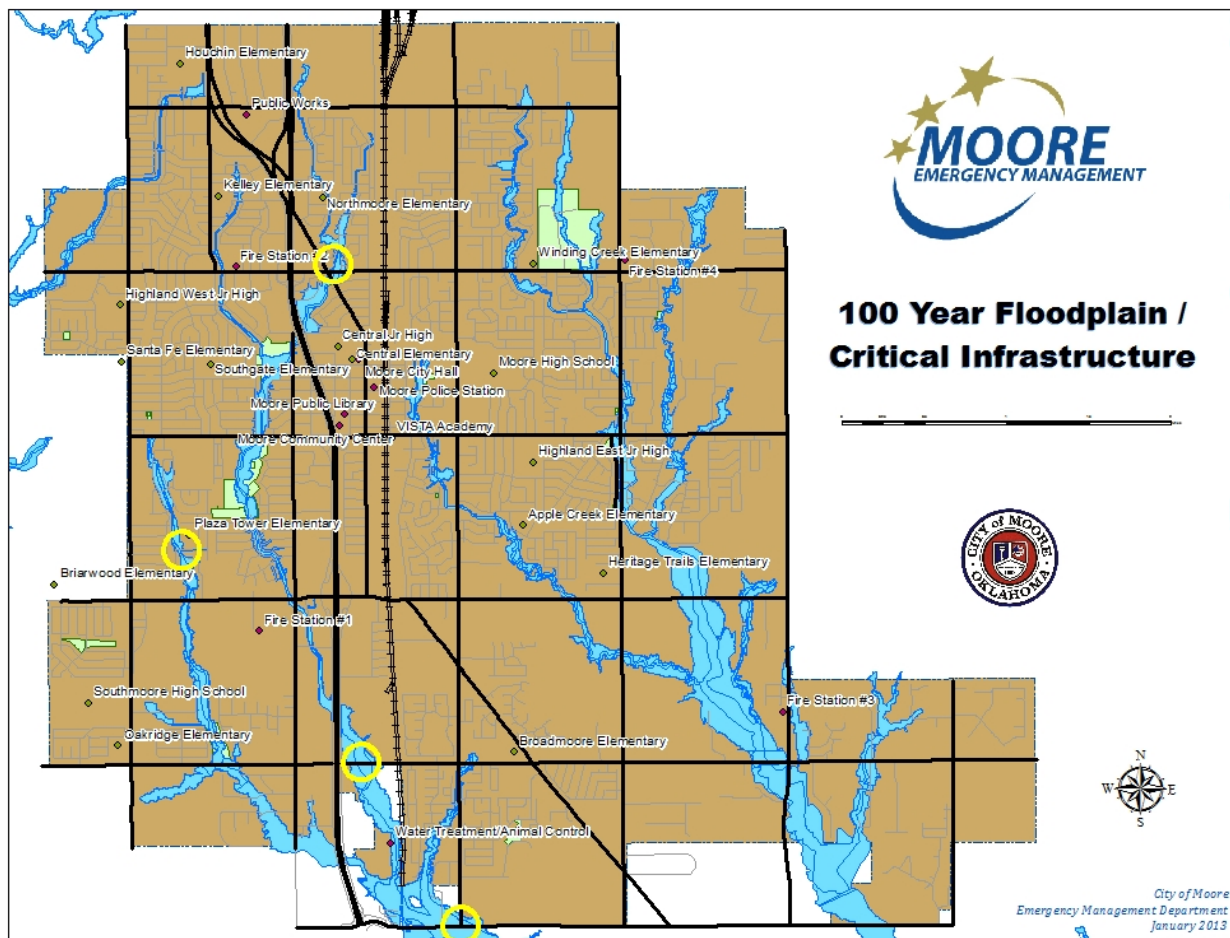
**THE CITY OF MOORE** is susceptible to flash-flooding primarily due to flash flooding on low lying streets. Even though school buildings would not be affected, the Moore Schools have occasionally had to cancel school due to flooded roadways on bus routes. There are three FEMA recognized repetitive loss properties in Moore.



The primary problem with flooding in the City of Moore involves flash-flooding where the street drainage system is not adequate to distribute the runoff from surrounding terrain when rains are exceptionally heavy. See Table 3-11 for list of previous events.

### **Probability of Future Events - Moore**

Because Moore is largely flat terrain, runoff is limited and slowed, but sometimes this causes flash-flood events. The yellow circles on the map following mark areas within the City of Moore where streets tend to flood which becomes problematic to transportation only. There has been no history of houses flooding. Drainage areas in the city have been modified to handle more runoff and problem areas will continue to be modified when necessary. No schools are affected by flooding except along bus routes that may incur high water. Based on past history, however, and input from the city and school district officials, the potential of flooding in the City of Moore is still considered “**Possible.**”



**THE CITY OF NOBLE** is susceptible generally to street flooding due to flash flooding. Even though school buildings are not anticipated to be affected by flooding, they may have to dismiss school following heavy rain periods due to high water affecting the roadways on bus routes.

The Canadian River flows along the western border of town; however, there have been no flood events due to the river in over 20 years.

The primary problem with flooding in the City of Noble involves flash-flooding where the street drainage system is not adequate to distribute the runoff from surrounding terrain when rains are exceptionally hard and due to small shallow, narrow, brush cluttered creeks throughout Noble.

Upgrading and widening many of these creeks would relieve flooding along them in many instances.



**Small tree/brush filled creeks run throughout Noble which adds to the flash-flood problems.**



Belle Creek flooding is increasing from smaller storms due to heavy undergrowth near stream channels and more runoff water flowing from developed areas. (1976 FEMA Flood Study).

### **Probability of Future Events - Noble**

Because Noble is flat terrain, runoff is limited and slowed, but sometimes this causes flash-flood events. Based on past history however, and input of the city and school district officials, the potential of flooding in the City of Noble is still considered “**Possible.**”

See Table 3-11 for list of previous events.

**THE CITY OF NORMAN** is susceptible to some flooding. The Norman School District had some flooding issues at Irving Elementary School but have alleviated the problem. No other school buildings in the district have had flooding problems although Norman Schools have occasionally had to cancel school due to flooded streets and roadways on bus routes.

Norman has experienced flood events in its history, in some instances damaging homes and businesses. Norman is flat terrain which causes runoff to be limited and slow, sometimes causing flash-flood events. Drainage areas in the city have been modified to handle more runoff and this project continues. Norman has an active Storm Water Master Plan. According to Norman Emergency Management, there are no longer FEMA recognized repetitive loss properties in Norman.

Several areas in Norman have been identified as having potential for flooding through the Storm Water Master Plan. None of the areas include the Norman Public Schools or the University of Oklahoma. The primary areas that have been identified in Norman's **Storm Water Master Plan** are shown on the following pages:

NOTE: The areas outlined in yellow are occupied structures that are the most likely to be affected by flooding.





The City of Norman assumes no responsibility for errors or omissions in the information presented.

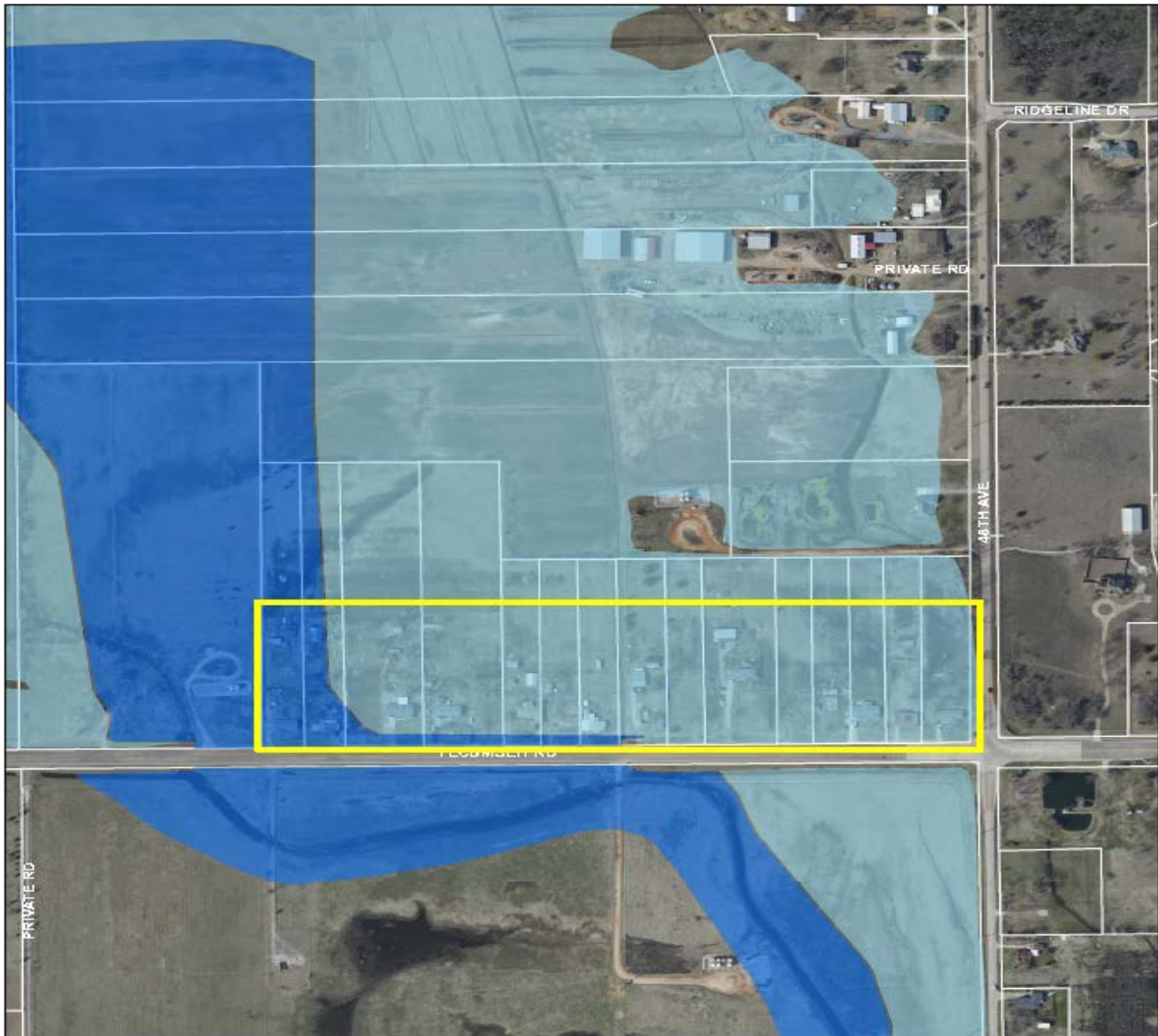
### W. Tecumseh Road and 48th Ave NW



1 inch = 400 feet

#### LEGEND

- Flood 2013
- 1% Chance Floodplain
- Floodway



The City of Norman assumes no responsibility for errors or omissions in the information presented.

### W. Tecumseh Road and 48th Ave NW



1 inch = 400 feet

#### LEGEND

- Flood 2013
- 1% Chance Floodplain
- Floodway

At least fourteen homes and/or outbuildings are susceptible to flooding in this area.



### Ranch Estates Manufactured Home Park



The City of Norman assumes no responsibility for errors or omissions in the information presented.



1 inch = 200 feet

#### LEGEND

- Flood 2013
- 1% Chance Floodplain
- Floodway



### Ranch Estates Manufactured Home Park



The City of Norman assumes no responsibility for errors or omissions in the information presented.

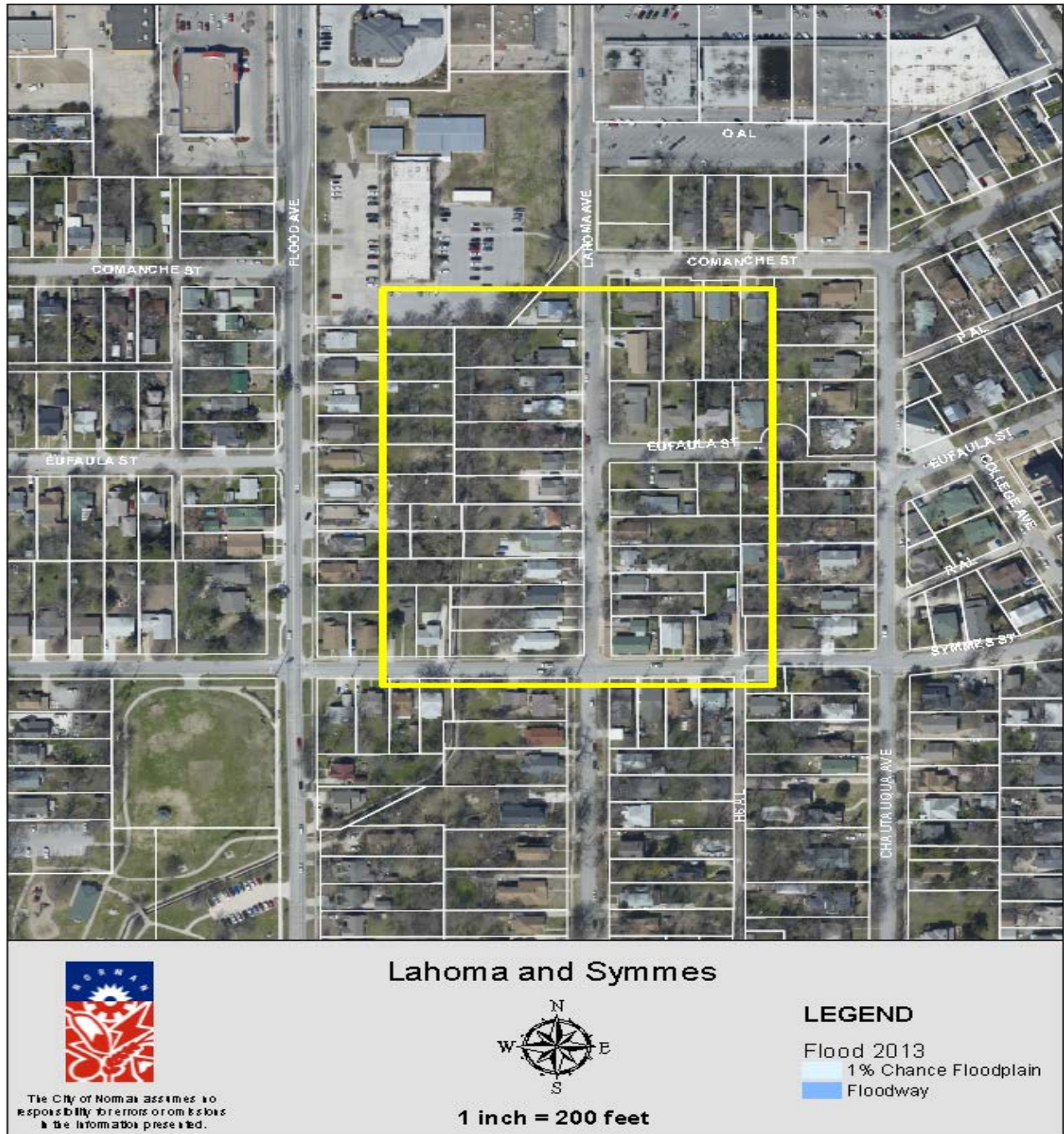


1 inch = 200 feet

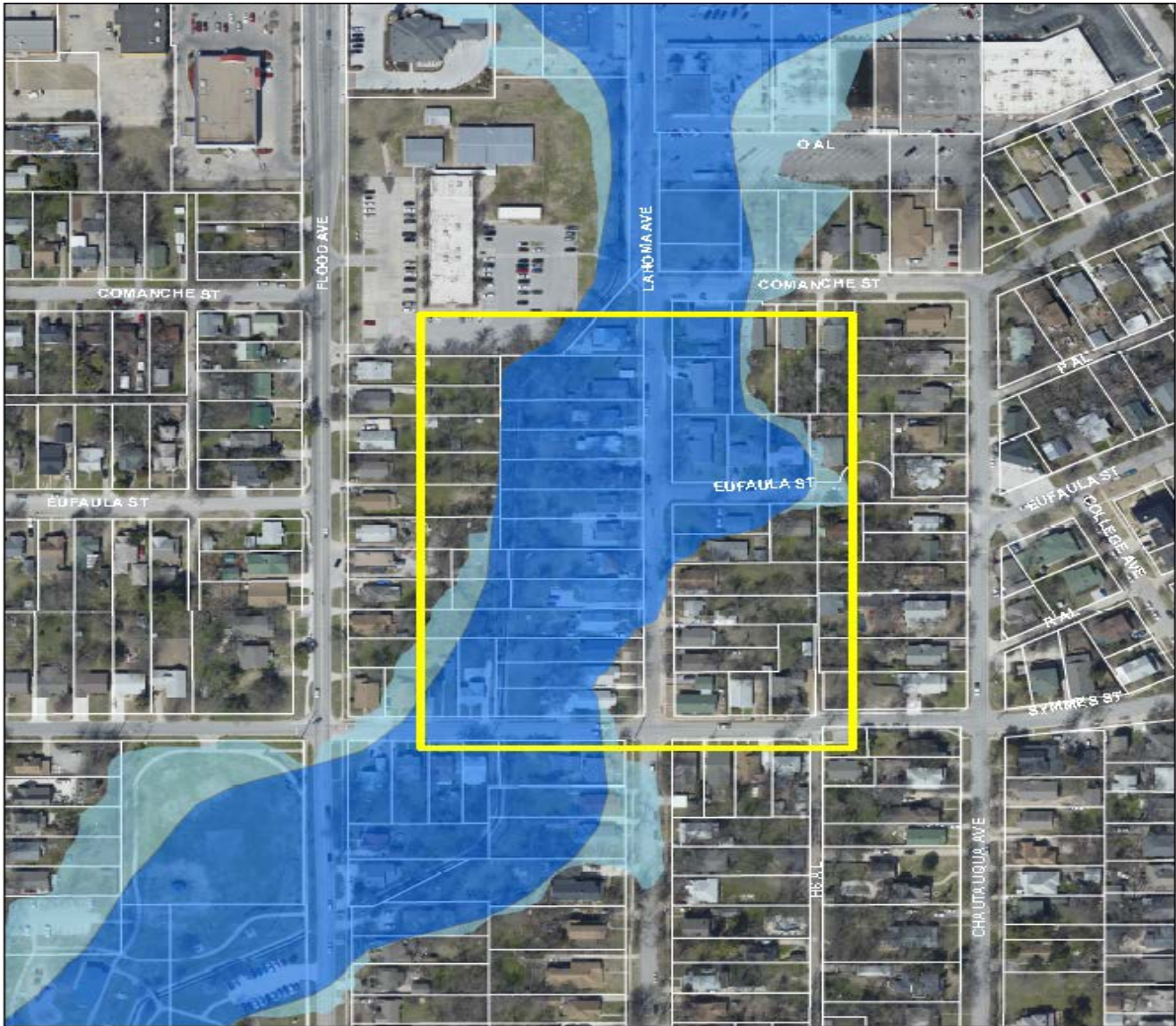
#### LEGEND

- Flood 2013
- 1% Chance Floodplain
- Floodway

Ranch Estates Mobile Home Park has 50 trailer spaces and has experienced flooding in the past. Mobile homes are especially vulnerable to flood water. Waters invading the floor structure of a mobile home will result in a total loss of the property according to the Red Cross and FEMA. In reviewing the above map, almost half of the park's residents are in the floodway.



Only two repetitive loss properties remain in this flood area. No other repetitive loss properties in Norman remain in the floodplain.



The City of Normal assumes no responsibility for errors or omissions in the information presented.

### Lahoma and Symmes

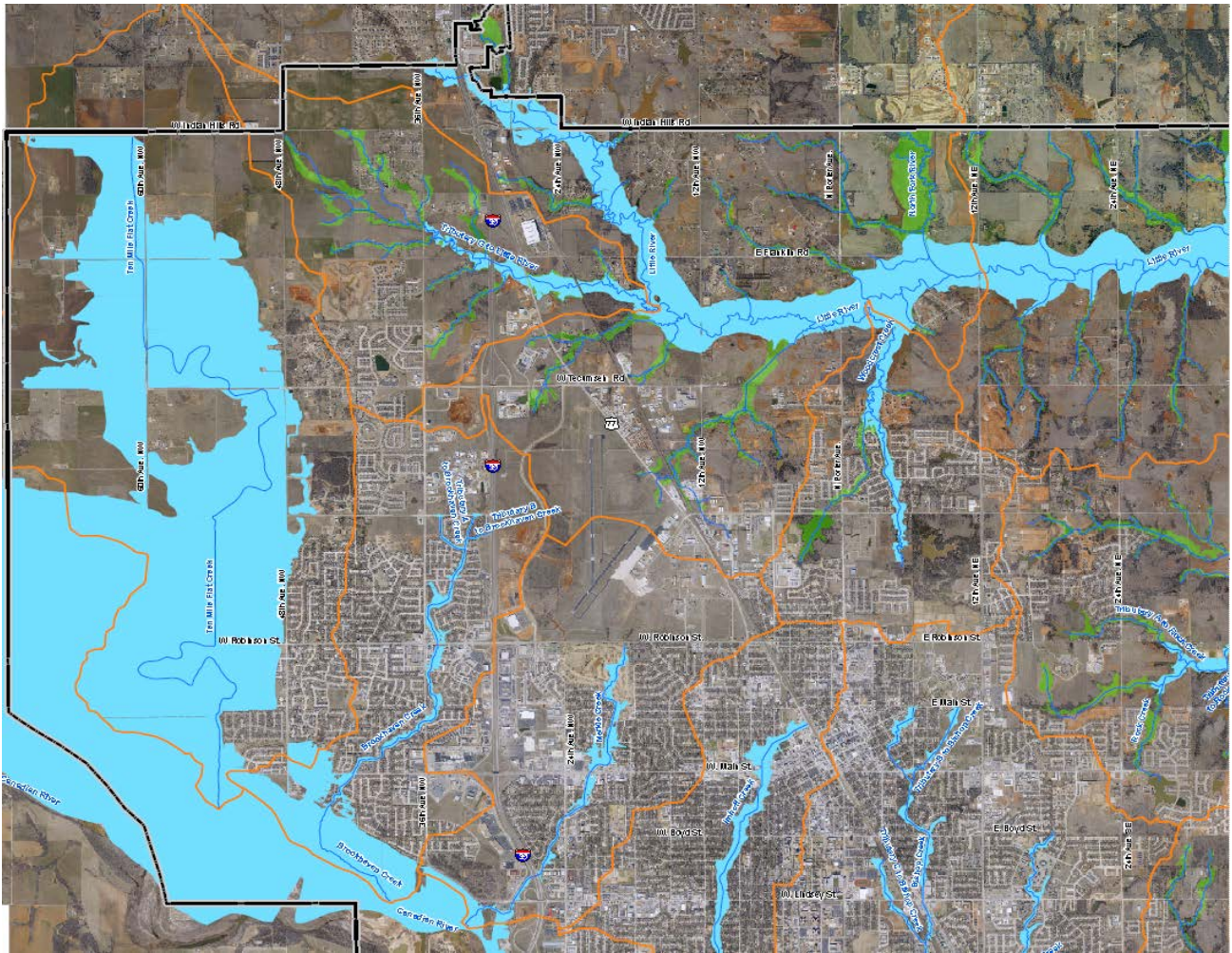


1 inch = 200 feet

#### LEGEND

- Flood 2013
- 1% Chance Floodplain
- Floodway

Almost 80 properties are at risk of flooding in this housing area.



The Canadian River also presents riverine flooding in Norman however as shown above, very few properties are left that would be affected by flooding. Based on past history and input from city officials and engineers involved with the Storm Water Master Plan, the potential of flooding in the City of Norman is considered “Likely,” although considerable efforts are underway to alleviate those problems. See Table 3-11 for list of previous events

**The Town of Slaughterville** has experienced flooding and flash flooding problems and flooding is a major problem from water runoff following a heavy rain. One such area is a 1-1/2 mile section of roadway located on 72<sup>nd</sup> St. north of Slaughterville Rd. to Etowah Rd.

## Probability of Future Events - Slaughterville

The Town of Slaughterville is at risk mainly from flash flooding of streets, which then impedes the flow of traffic forcing people to find alternate routes and delayed response for emergency services. The potential for future flooding in the Town of Slaughterville is “Likely”.

## Probability of Future Events - Cleveland County

Because Cleveland County is largely flat terrain, runoff is limited and slowed, sometimes causing flash-flood and flood events. Drainage areas in the county have been modified to handle more runoff and populated areas have been cleared of structures to avoid much of the damage that once occurred in Cleveland County. Based on past history and CCHMPT input, the potential of flooding in Cleveland County is still considered “**Possible**.” Although there are areas close to Etowah; flooding within the community city limits is limited to occasional flash-flooding. Flooding is not a major problem in Etowah at this time and is referred to in action projects only as aids to locating the area in the county.

## Vulnerability and Impact

Whether from rivers and streams, dam failure or from flash flooding caused by over taxed water drainage systems, flooding can still be considered a major destructive force in Oklahoma. Neither property nor lives are exempt from its ravages. In Cleveland County, despite warning signs, people have driven into flooded roadways and been swept off by faster than anticipated currents or driven onto a washed out road “hidden” by flood waters. Emergency Services have then been called to perform rescues. Flooding rivers and streams have invaded homes and businesses destroying floors, walls and contents causing people to have to relocate and some become unemployed due to the closure of their business. Farmers and ranchers lose



thousands of dollars’ worth of wheat, cotton, sorghum, and hay, as well as livestock when flood waters overrun their fields. See Appendix C – Critical Facilities for more information on vulnerability and impacts of critical facilities at risk from flooding.



Communications towers, telephone and electric lines are above ground and are often impacted by flooding rivers or creeks. Transportation routes are always affected by flood waters whether they are the local county roads or major highways. Cleveland County has a number of main highways including Interstate 35 that runs the length of the county. Although seldom affected by flooding, the possibility exists. Such an event would create massive transportation problems.

The impact of their losses not only affect Cleveland County's economy but also the State of Oklahoma and national economies since many of the local farmers and ranchers sell to buyers who deal in these markets.

## **Conclusions**

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Residents of Cleveland County are on the alert during heavy rain periods regarding the flood threat and the treacherous conditions caused by it. New residents have and are still moving into Cleveland County and need to be educated on the dangers of flooding. New and better methods are being developed to deal with areas that have restricted drainage (whether river or creeks) that feed into larger rivers. Cleveland County plans to continue its mitigation battle with the flood waters when they come and hope one day to no longer experience floods.

## **References**

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Cleveland County Emergency Management  
National Climatic Data Center (NCDC) <http://www.ncdc.noaa.gov/stormevents/>

## HAZARD PROFILE

### Hail – Cleveland County

Hail forms in storm clouds when super-cooled water droplets freeze on contact with condensation nuclei, such as dust. The storm's updraft blows the hailstones to the upper part of the cloud. The updraft dissipates and the hailstones fall down, back into the updraft, and are lifted up again. The hailstone gains an ice layer and grows increasingly larger with each ascent. Once a hailstone becomes too heavy to be supported by the storm's updraft, it falls out of the cloud. This movement up and down inside the cloud, through cold then warmer temperatures, causes the droplet to add layers of ice and can become quite large, sometimes round or oval shaped and sometimes irregularly shaped. The size ranges from smaller than a pea to as large as a softball and larger, and can be very destructive to buildings, vehicles and crops.



The National Weather Service uses a network of Nexrad Doppler radars to detect hail. Hail size and probability can be determined from radar data with a computer by different algorithms.

### Location

All of Cleveland County including the unincorporated communities and the incorporated communities, all public school districts, the University of Oklahoma and Moore/Norman Technology Center are susceptible to hail storms. Usually associated with severe thunderstorms, hail damage is a hazard for all structures, wildlife, livestock and the entire population.

### Extent

Hail usually lasts an average of 10 to 20 minutes but may last much longer in some storms and is usually in relatively small coverage paths. Hail causes billions in crop and property damage each year in the U.S. Even small hail can cause significant damage to young and tender plants. The peak periods for hailstorms, late spring and early summer, coincide with Oklahoma's most critical agricultural seasons for wheat, corn, barley, oats, rye, and fruit trees. Cleveland County

is primarily a ranching area but many of the agricultural products raised by these ranchers are produced as feed for livestock.

**Table 3-12**

<b>Combined NOAA/TORRO Hailstorm Intensity Scales</b>				
<b>Size Code</b>	<b>Intensity Category</b>	<b>Typical Hail Diameter (inches)</b>	<b>Approximate Size</b>	<b>Typical Damage Impacts</b>
H0	Hard Hail	up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble or Mothball	Slight damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime or grape	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.20	Nickel to Quarter	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2-1.6	Half Dollar to Ping Pong Ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Silver dollar to Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Lime or Egg	Aircraft bodywork dented, brick walls pitted
H7	Very destructive	2.4-3.0	Tennis ball	Severe roof damage, risk of serious injuries
H8	Very destructive	3.0-3.5	Baseball to Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5-4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4+	Softball and up	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

The NOAA/TORRO Hailstorm Intensity scale above describes the levels of hail possible and potential damage that results. The Cleveland County Hazard Mitigation Planning Team considers anything in the magnitude of H2 or higher on this scale to be significant due to crop losses and the economic hardship it creates for farmers and ranchers. Once the size of hail rises to H3-H4 magnitude, it becomes disastrous to equipment and other property that is outdoors and unprotected.

## Previous Occurrences

There are numerous incidents of hail produced by the severe thunderstorms that occur frequently in Cleveland County each year. NCDC reports 446 hail events in Cleveland County between 1950 and 2012. Since 2001, 128 hail events have been reported in Cleveland County with one inch of hail or larger, three of which reported damage. In the interest of space, only those hailstorms with two inch hail OR which caused damage will be listed. Records are not generally kept for damages caused by hail events.

**Table 3-13**

<b>CLEVELAND COUNTY MAJOR HAIL EVENTS</b> <b>2001 - March 2013 (1.5 inches or larger or damage)</b> <small>Source: National Climatic Data Center</small>		
Date	Location	Description
28 May 2012	Stella	<b>1.75"- Monetary damages unavailable</b> – A potent mid-latitude storm system moved across the Northern Plains the afternoon of the 29th, bringing a potent cold front into western Oklahoma early in the day. The front combined with moderate afternoon instability and moderate to strong upper level westerly winds to generate numerous severe thunderstorms across central Oklahoma. Numerous reports of large hail and damaging winds were received.
14 April 2012	Cleveland County	<b>1.75"- Monetary damages unavailable</b> – A severe weather event began during the early afternoon hours of Friday, April 13, and lasted through the early morning hours Saturday. Around a dozen tornados, as well as large hail, and strong wind gusts were produced by the numerous thunderstorms that occurred during this event. Much of the severe weather occurred in parts of southwestern and central Oklahoma.
24 April 2011	3 miles SSW of Moore	<b>1.50"– 1.75" - Monetary damages unavailable</b> – Thunderstorms were ongoing north of the front from southwest into central Oklahoma for much of the afternoon. Marginally severe hail was reported with a few of the storms, with much needed rainfall occurring as well.
14 June 2011	2 miles SSE of Norman	<b>1.50" – 1.75" - Monetary damages unavailable</b> - The most damaging storm occurred over central Oklahoma, specifically near Norman and Oklahoma City. Shortly after 7 pm, a wet downburst caused intense rainfall and was accompanied by hail up to golf-ball size and winds that were measured at over 80 mph. Damage was reported over much of Norman, with the most intense damage occurring over the northern half of the city.
19 May 2010	6 miles SSE of Lake Thunderbird Dam	<b>2.5" HAIL - Monetary damages unavailable</b> - two supercell thunderstorms developed further south along the dry line that moved into central Oklahoma.
19 May 2010	2 miles SSE of Noble	<b>3" HAIL - Monetary damages unavailable</b> - two supercell thunderstorms developed further south along the dry line that moved into central Oklahoma.
10 May 2010	1 mile ESE of Moore	<b>2.75" HAIL - Monetary damages unavailable</b> - A significant outbreak of severe thunderstorms and tornadoes affected a large part of northern, central, and southern Oklahoma. Tree damage was also

## CLEVELAND COUNTY MAJOR HAIL EVENTS 2001 - March 2013 (1.5 inches or larger or damage)

Source: National Climatic Data Center

Date	Location	Description
		reported.
10 May 2010	1 mile ENE of Moore	<b>4.6" HAIL - Monetary damages unavailable</b> - Photographic evidence showed numerous hail stones at least softball size, with one picture showing a measured stone of 4.6. Other hail stones were reportedly up to 5 in diameter. Some of the hail either embedded in roof tops, or punctured their way through. Significant damage to automobiles was also reported throughout the town of Moore.
10 May 2010	Moore	<b>2.13" – 2.75" HAIL - Monetary damages unavailable</b> - Severe thunderstorms erupted by mid-afternoon across northern and western Oklahoma. Given the potent combination of ingredients in place, storms began to produce tornadoes quickly after initiation. Storm motions of 50 to 60 mph were common. During the mid-afternoon hours, severe weather was confined to northern Oklahoma.
30 Apr 2009	2 miles S of Noble	<b>2.75" HAIL - Monetary damages unavailable</b> - two supercell thunderstorms developed further south along the dry line that moved into central Oklahoma.
12 May 2009	2 miles E of Norman	<b>2" HAIL – Monetary damages unavailable</b> - Half dollar to two inch hail was reported at Porter Avenue and Rock Creek Road. The hail fell for about five minutes.
05 Nov 2008	4 miles WNW of Norman	<b>1.75 - 2" HAIL - \$40,000,000 damage estimated</b> - Numerous strong to severe thunderstorms developed ahead of a dry line, west of Interstate 35, and moved northeast into central and northern Oklahoma. The thunderstorms became severe and produced large hail and some damaging winds. Several areas reported hail covering ground a couple of inches deep. Two additional rounds of thunderstorms developed by nightfall, with some areas receiving large hail three to five separate times. Some of the hail reached over golf ball size, and this combined with strong winds caused fairly significant roof, window, and fence damage. The most widespread damage occurred in the northwest Norman area, with an estimated \$40 million in damage.
13 Jun 2008	Moore	<b>2" HAIL - Monetary damages unavailable</b> - Thunderstorms developed along an outflow boundary that was situated over central Oklahoma during the afternoon and evening hours of the 13th. The hail was reported on 34TH and Broadway Avenue.
30 Jul 2003	Norman	<b>1.75" Hail - \$500,000 damage estimated</b> - Hail combined with almost 80 mph wind gust caused hail damage in northwest portions of the city. Several windows were broken and holes put in window screens. Numerous homes sustained roof damage also.
24 Mar 2004	Cleveland County	<b>1.75" – 2.75" Hail - \$50,000 damage estimated</b> - Roof damage, due to large hail, was reported. Several supercell thunderstorms developed during the evening of the 24th, along and just behind a strong cold front that moved through the area.
24 May 2001	1 mile NW of Moore	<b>2.0" – 2.75" HAIL - Monetary damages unavailable</b> - Hail was reported near NW 12th and Santa Fe. Several supercell thunderstorms developed during the evening of the 24th, along and just behind a strong cold front that moved through the area. Numerous occurrences of large hail, with the largest hail stone reported to be baseball size (2.75 inches in diameter), and several areas of significant wind damage accompanied these thunderstorms.

## Probability of Future Events

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Cleveland County properties and people are vulnerable to hail storms. According to the Oklahoma Climatological Survey (OCS), Cleveland County experiences an average of three hail events annually. Damage usually occurs to structural glass, roofs and to vehicles. The CCHMPT considered the probability of future events based on past experience and concluded that severe thunderstorms including hail were indeed highly likely in the future. The entire county is at risk from hail and the probability of future events is “**Highly Likely.**”

## Vulnerability and Impact

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While the stronger hail events tend to be associated with severe thunderstorms, and often do extensive damage to structures, vehicles and crops, smaller less intense thunderstorms frequently produce smaller hail, (based on the NOAA/TORRO Hailstorm Intensity Scale, H2 size dime or grape size hail) which often causes only slight to significant damage to agricultural crops. This affects the rural areas of Cleveland County along with the incorporated jurisdictions (Etowah, Lexington, Noble and Slaughterville). These jurisdictions often use metal buildings for their facilities, including fire stations, city hall, local stores and supply centers. These types of buildings are certainly susceptible to the effects of hail and often sustain some type of damage. The larger cities (Moore and Norman) as well as the schools districts, Moore-Norman Technology Center and the University of Oklahoma, tend to have sturdier types of construction (block, brick, masonry, etc.) but may still sustain damage to windows and roofs of these structures. Newer construction may have a stronger type of window construction, but occupants can still be at risk from flying debris based upon the strength and velocity of the hail storm.

Early warning research is ongoing through the National Weather Service (NOAA) and the Oklahoma Climatological Survey to improve warning and threat information for the public. In spite of this research and the warning system currently available to the public, people are often injured trying to get to adequate shelter. Property damage and personal injury can occur within a very short period of time.

Hail damage to roofs of structures causes roofs to be replaced more frequently than the normal life of roofing material, thus costing insurance companies and property owners millions of dollars annually. Property owners on occasion may have to find temporary housing or business location due to the amount of roof damage on their structure. For businesses, this causes a loss of business and in extreme cases could affect employee jobs. In addition to structural damage,

vehicles, agricultural crops, livestock and wildlife also are threatened by hailstorms most of which cause economic losses. Livestock and wildlife occasionally are injured or killed (especially during large hail events) causing an economic loss. See Appendix C – Critical Facilities for more information on vulnerability and impacts of critical facilities at risk from a hail storm.

## Conclusion

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Cleveland County and all participating jurisdictions are susceptible to hail storms that cause local residents thousands of dollars in damages annually. Little can be done to mitigate damages to crops or livestock, but thanks to technology, mitigation for residents and structures is available today. Window film or hail resistant roofing materials can help alleviate the effects of hail on structures. Cleveland County and all of the participating jurisdictions will continue to address the problem of hail damage and injuries through assistance of the Hazard Mitigation Program.

## References

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NCDC - National Climatic Data Center (<http://www.ncdc.noaa.gov/stormevents/>)  
OCS - Oklahoma Climatological Survey (<http://climate.mesonet.org/>)

## HAZARD PROFILE

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### High Winds – Cleveland County

Thunderstorms occur when moist air near the ground becomes heated, especially in the summer, and rises, forming cumulonimbus clouds that produce precipitation. High winds are almost always a part of a thunderstorm, although it is possible for them to occur without a thunderstorm.



Wind is defined as the motion of air relative to the earth's surface. **High Winds** are winds that reach speeds of 50 mph or greater, either sustained or gusting. They are a common feature of thunderstorms, particularly severe thunderstorms. The National Weather Service uses winds in excess of 58 mph as one of the measurements in determining a thunderstorm to be severe. High winds can result from thunderstorm inflow and outflow, or

downburst winds when the storm cloud collapses, and can result from strong frontal systems, or gradient winds (high or low pressure systems) moving across Oklahoma.

### Location

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All of Cleveland County, including the unincorporated communities and the incorporated communities, all public school districts, the University of Oklahoma and Moore/Norman Technology Center are susceptible to the threat of high winds.

### Extent

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High Winds are experienced throughout Oklahoma where people and property are exposed to the elements. They have caused heavy damage to buildings and power supplies. Winds in excess of 55 miles per hour are also cause for concern due to the threat to mobile homes and small outbuildings.

Cleveland County, including all participating jurisdictions experiences 31-40 high wind events on average annually (map below). A wind speed is the rate of the motion of the air on a unit of time. It can be measured in a number of ways. In observing, it is measured in knots, or nautical miles per hour. The unit most often used in the United States is miles per hour.





## Beaufort Wind Scale for Land

No.	Knots	mph	Description	Effects on land
6	22-27	25-31mph	Strong wind	Large branches move. Whistling in phone wires. Difficult to use umbrellas.
7	28-33	32-38mph	Very strong wind	Whole trees in motion.
8	34-40	39-46mph	Gale	Twigs break off trees. Difficult to walk.
9	41-47	47-54mph	Severe gale	Chimney pots and slates removed.
10	48-55	55-63mph	Storm	Trees uprooted. Structural damage.
11	56-63	64-72mph	Severe storm	Widespread damage.
12	63	73mph	Hurricane force	Widespread damage. Very rarely experienced on land.

sailors, but has since been modified by the National Weather Service for use on land. Cleveland County, incorporated communities, all public school districts, the University of Oklahoma and Moore/Norman Technology Center considers anything higher than a force 10 on the Beaufort Scale to be severe and warrants high wind warnings due to the potential of loose flying debris.

### Previous Occurrences

There are hundreds of thunderstorm events across Oklahoma each year, most bringing welcome precipitation but many containing high winds which sometimes cause significant damage, injury, or even deaths. There have been numerous high winds that have occurred causing only tree damage. Those are not listed in this plan. NCDC lists 243 high wind events in Cleveland County since 1950 (located in the previous edition of NCDC), 102 of which have occurred since 2001. 39 High Wind events have caused damage since 2001. In the interest of space, only the eighteen storms which caused structural damage of \$10,000 or more are listed in the table below. No injuries or deaths have been reported in Cleveland County due to high winds.

Table 3-15

<b>CLEVELAND COUNTY HIGH WIND EVENTS</b> <b>2001 – April 2011</b> NCDC – National Climatic Data Survey NWS – National Weather Service - Norman			
<b>Date</b>	<b>Location</b>	<b>Description</b>	<b>Est. Damage</b>
29 May 2012	Norman	<b>61 knots</b> - Spotter reported 70 mph wind gusts with several street signs blown down. Numerous homes received light to moderate fence damage with some minor roof damage.	\$1,000,000 (statewide)
07 Nov 2011	Norman	<b>61 knots</b> - Damage was reported to hangars and planes at Max Westheimer Airport.	No estimate available
02 Apr 2010	Norman	<b>65 knots</b> - a semi-trailer was blown over near I-35 and Highway 77. More damage occurred to flag poles, and fencing and came to an end near Indian Hills Road and Bryant Avenue.	No estimate available
07 Jul 2009	Slaughterville	<b>61 knots</b> - Very strong winds were reported sporadically from Comanche into Pottawatomie counties due to the collapsing thunderstorms. Winds were measured as high as 71 mph, with damage reported in several communities. An outbuilding was destroyed with some damage to a house from the debris three miles east of Slaughterville, or between 108th and 120th streets on Slaughterville Road. A portable building was damaged at the intersection of 48th Street and Highway 77. A roof of a barn was blown 100 yards to the north. A shed with concrete anchors was blown 25 yards, and 8-inch diameter tree limbs were downed. Monetary damages were estimated. Monetary damages were estimated.	\$17,000
09 Jul 2008	Norman	<b>56 knots</b> - An outflow boundary moved slowly south and settled south of Interstate 40. Several trees were blown down at Reeves Park in Norman.	\$10,000
09 Jul 2007	Norman	<b>52 knots</b> - An upper level wave accompanied this front, and combined with afternoon heating helping severe thunderstorms to develop during the afternoon and overnight hours. Large trees were downed and large tree limbs were broken in Norman on the University of Oklahoma Campus, especially along Jenkins Avenue near Reeves Park, the band practice field, near the law school, and at the National Weather Center.	\$ 12,000.
19 Jun 2007	Norman	<b>52 knots</b> - A widespread severe thunderstorm event occurred over much of Oklahoma. A large tree was blown onto a white convertible with four passengers inside. No injuries were reported.	\$15,000.
24 Feb 2007	Cleveland County	<b>50 knots</b> - The strong winds caused a lot of damage across the state. Most of the damage consisted of extensive tree and power line damage. The power line damage resulted in thousands to lose power during parts of the afternoon.	\$12,000
08 Aug 2006	Norman	<b>61 knots</b> - Numerous 6-8 inch diameter tree limbs were broken near Lions Park. A 50 foot section of fence was downed at a home in town. Several 4x4 posts were	\$ 20,000.

## CLEVELAND COUNTY HIGH WIND EVENTS 2001 – April 2011

NCDC – National Climatic Data Survey  
NWS – National Weather Service - Norman

Date	Location	Description	Est. Damage
		snapped. The awning was peeled away from another house nearby.	
12 Jun 2005	Moore	<b>61 knots</b> - Strong wind gusts caused part of the roof and front paneling on a vacant warehouse to be ripped off. A backyard fence was also destroyed with 4x4 posts snapped in half.	\$ 10,000.
30 Jul 2003	Norman	<b>68 knots</b> - Numerous trees, power poles, and fences were downed across town. A car was damaged when a tree fell on it. Many homes sustained roof damage. Three semi-tractor trailers were overturned on Interstate 35 near the Tecumseh Road exit. Briggs and Stratton and the National Guard Maintenance facility sustained roof damage. Portions of both metal roofs were damaged. Stock was damaged at Briggs and Stratton due to water that came in after roof was removed. Garage doors were also pushed in at the National Guard facility. Max Westheimer Airport also sustained some damage. A hanger roof was damaged along with several airplanes moved. At least two airplanes were overturned. The worst damage occurred in northwest portions of the city.	\$ 500,000
08 May 2003	Moore	<b>56 knots</b> - Most of the damage was limited to downed trees and tree limbs. A tornado also occurred during this time but dissipated with the RFD winds continuing. Straight-line wind damage continued in this area until another tornado developed 1.5 miles west-northwest of Moore.	\$25,000
08 Jun 2002	Norman	<b>Unknown</b> - A small area of severe winds accompanied a thunderstorm across a one mile wide area from four miles west of Norman to five miles northwest of Norman. Trees were uprooted. Fences were blown over, and minor structural damage was sustained to roofs and guttering.	\$50,000
16 Sep 2001	Stella	<b>Unknown</b> - Several large trees were uprooted, and one tree fell on a carport with two vehicles under it. Minor roof damage also occurred.	\$40,000
18 May 2001	Lexington	<b>Unknown</b> - Numerous trees and power lines were downed.	\$10,000
18 May 2001	Norman	<b>Unknown</b> - Major roof damage was sustained to Tinker Credit Union. Rain then damaged electrical equipment inside.	\$35,000
18 May 2001	Moore	<b>Unknown</b> - A greenhouse was destroyed at Walmart.	\$25,000

### Probability of Future Events

Considering past history, and the location of Oklahoma between the dry arid southwest and the moist air from the Gulf of Mexico, all of Cleveland County has significant exposure to High Wind events. Damage usually occurs to infrastructure such as power transmission lines and

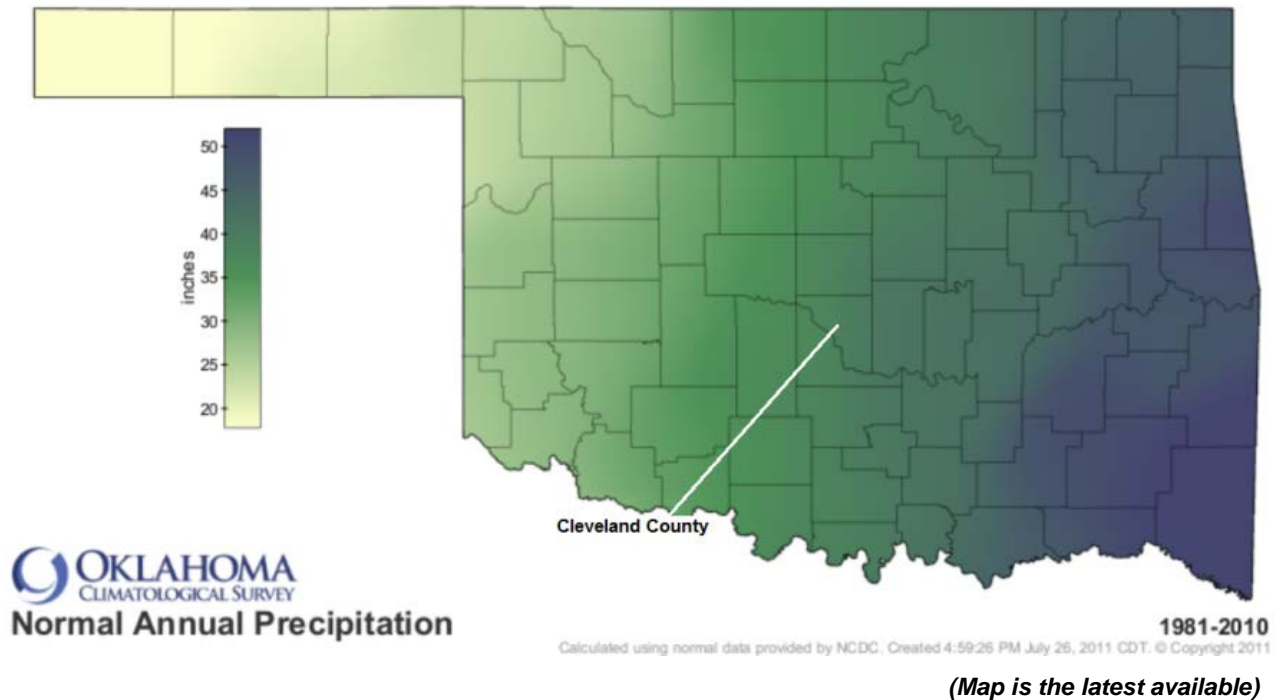
communications towers; however occasional damage can occur to structures. Early warning research is ongoing through the National Weather Service (NOAA) and other private organizations to improve warning and threat information for the public.

There will continue to be property damage and possibly even deaths due to the “Oklahoma Thunderstorm” containing high winds. The probability of future events for Cleveland County and participating jurisdictions and school systems is “**Likely.**”

**Cleveland County Precipitation:**

Average Annual: 37.29 inches  
Days With Precipitation: 75  
Wettest Year: 56.65 inches in 1941  
Driest Year: 18.04 inches in 1954  
Greatest Daily Rainfall: 8.95 inches  
(Norman, Oct. 22, 1908)

Data from Oklahoma Climatological Survey



## Vulnerability and Impact

High winds have been responsible for wind damage to structures and crops in Cleveland County. High winds can cause death or injury to humans when buildings, especially mobile homes that may collapse under winds of 80 – 100 miles an hour. Wind damaged crops create hardship for the farmers and ranchers who experience a financial loss. Power systems are

heavily affected by high winds. The state is located southeast of the Rockies which provides cool air, north of the Gulf of Mexico that provides moisture and northeast of the dry hot air from the arid southwest, allowing thunderstorms to form which generate high winds. The highest period of thunderstorms is generally through the middle to late spring months of April, May and June, which also aligns with Oklahoma's major tornado season.

Cleveland County's population and property are as vulnerable to severe thunderstorms with high winds, as any other part of the state. Damage usually occurs to infrastructure such as power transmission lines and communications towers; however, occasional damage can occur to structures.



Economic losses occur to the communities and county when crop damages occur or if wind damages businesses the business owner experiences financial loss that causes a loss of jobs for employees of that business until the business can be repaired. Homes that are damaged by high winds often are uninhabitable and the occupants must relocate. Other damages can occur including downed trees, blocked traffic

lanes and power outages causing loss of power to critical facilities and the general population. See Appendix C – Critical Facilities for more information on vulnerability and impacts of critical facilities at risk from high winds.

## Conclusion

High winds and thunderstorm winds cause millions of dollars of damage throughout the United States every year. Cleveland County experiences high winds during many of the annual thunderstorms. Fortunately, most of these wind events do not cause reportable damage or cause only minor damage to power lines or trees. However, even these can cause inconvenience to local residents.



## References

NWS - National Weather Service - Norman <http://www.srh.noaa.gov/oun/>  
NCDC - National Climatic Data Center (<http://www.ncdc.noaa.gov/stormevents/>)

## HAZARD PROFILE

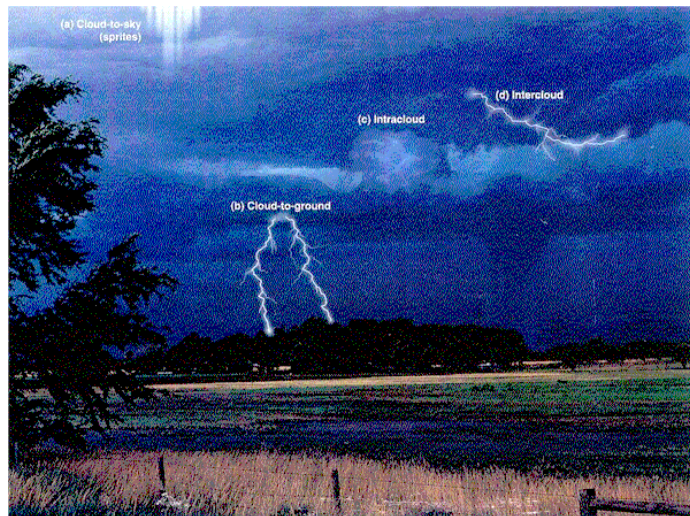
### Lightning – Cleveland County

Lightning is a result of electrical charges accumulating at the base of the clouds until Lightning is discharged. Thunderstorms occur when moist air near the ground becomes heated, especially in the summer, and rises, forming cumulonimbus clouds that produce precipitation. Lightning is almost always a part of a thunderstorm. Air in the path of the lightning expands as a result of being heated, causing thunder. The sound produced by the electricity passing rapidly through the atmosphere causes thunder.



There are four forms of Lightning, as shown in the picture at the right: Cloud to sky, Intracloud, Intercloud and the most dangerous, Cloud to Ground.

**Cloud to Sky Lightning** is a discharge jumping from a cloud into the surrounding sky. Other forms of lightning contain elements of Cloud to Sky lightning in the forks which extend from the main strike.



**Intracloud Lightning** is the most common form of lightning, in which oppositely charged centers within the same cloud ignite and cause a bright flash within the same cloud.

**Intercloud Lightning** is lightning which occurs between oppositely charged areas of different clouds

**Cloud to Ground Lightning** is the most dangerous form of lightning, in which the negatively charged bottom of the cloud travels to the positively charged ground below, or whatever object is highest, including the top of a building or a tall tree. It is not the most common form of lightning, but it is the most recognized. It is possible for positive charges to flow from higher parts of the thundercloud to the ground, though this more rare.

All types of lightning are dangerous, particularly to aircraft flying near thunderstorms. Lightning is a thunderstorm's number two killer each year in the U.S.

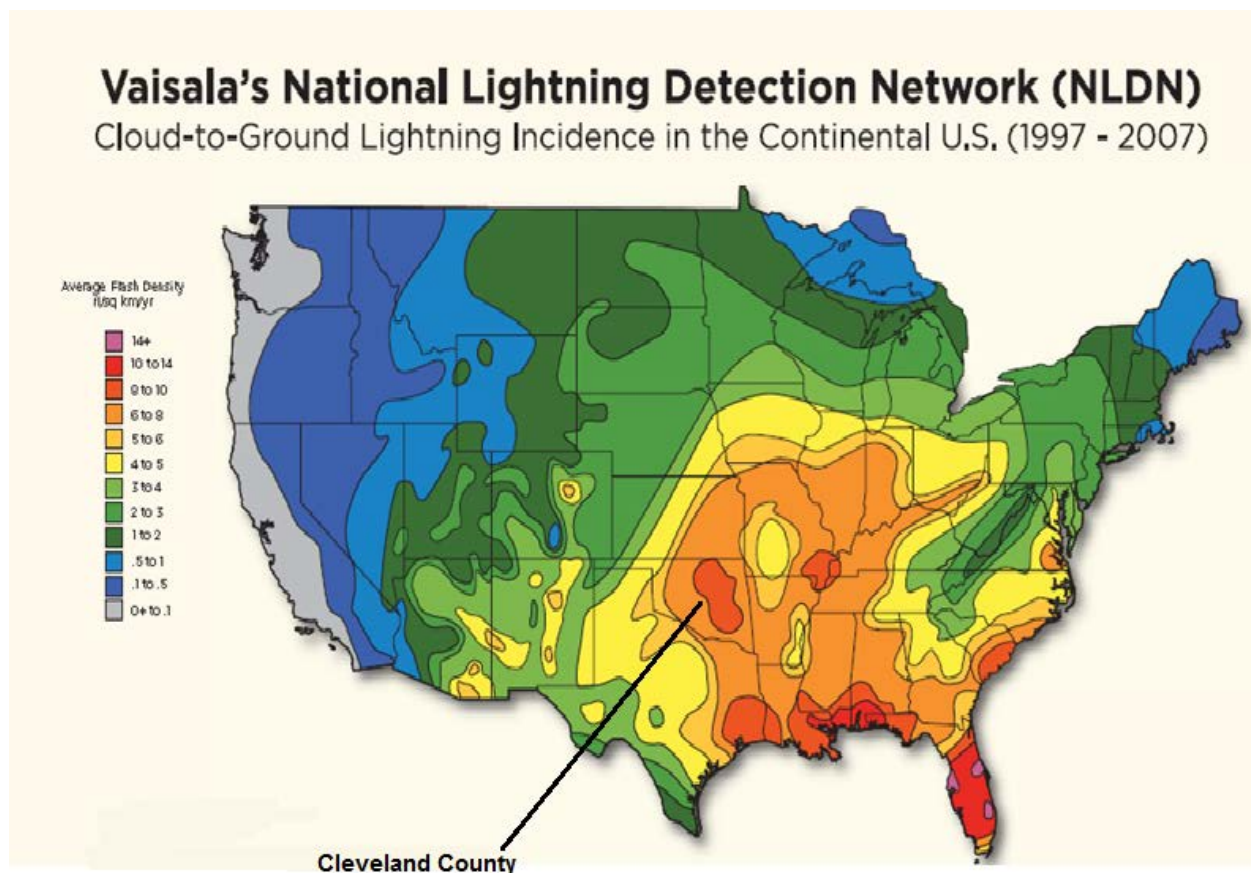
### Location

The CCHMPT believes that all of Cleveland County, including the unincorporated communities and the incorporated communities, all public school districts, the University of Oklahoma and

Moore/Norman Technology Center are susceptible to the threat of Lightning. Outdoor events are especially susceptible.

Cleveland County's population and property are as vulnerable to severe thunderstorms with lightning as any other part of the state. Damage usually occurs to infrastructure such as power transmission lines and communications towers; however, occasional damage can occur to structures.

Lightning density maps provided by Vaisala-GAI (formerly Global Atmospheric), Tucson,



Arizona. The map is for general informational and educational purposes only and is not indicative of current or future lightning activity. The 5-year Flash Density Map shows the average amount of lightning recorded in 1996-2000. The average amount of lightning that occurs in any given area varies significantly from year to year. According to the Vaisala map, Cleveland County has an average of 6 – 9 lightning flashes per square kilometer per year.



## Extent

Lightning is an underrated killer. It is experienced throughout Oklahoma where people and property are exposed to the elements. From 1980 to the mid-1990s, lightning killed an average of 82 people per year in the United States. However, in recent years, that number has dropped to an average number of deaths per year of 62. Lightning has also caused heavy damage to buildings and power supplies. While lightning has not caused any known deaths in Cleveland County, it has caused two injuries and \$1,059,000 in damage since 1993, when the NCDC began keeping records of deaths, injuries, and damage caused by lightning. The potential is there, however, for deaths or injuries to occur, particularly during recreational activities such as golf or fishing, both popular in Cleveland County. Obviously Cleveland County officials and the CCHMPT considers any lightning event serious and citizens should take precautions to take cover either in a vehicle or structure. Lightning has caused wildfires and downed power lines, causing major crop damage and power outages. In Cleveland County all thunderstorms with lightning are considered dangerous because they have caused damage to buildings and power supplies.

## Previous Occurrences

There are hundreds of lightning events across Oklahoma each year, most bringing welcome precipitation in the accompanying storm, but many cause significant damage or injury and even death. There have been numerous thunderstorms with lightning that have occurred causing only tree damage. Out of these hundreds of annual strikes, NCDC lists six lightning events in Cleveland County since 2001. The storms listed caused injury and/or structural damage.

**Table 3-16**

<b>CLEVELAND COUNTY LIGHTNING EVENTS</b>			
<b>2001 – April 2011</b>			
Data from National Climatic Data Center			
<b>Date</b>	<b>Location</b>	<b>Description</b>	<b>Est. Damage</b>
<b>10 Jul 2006</b>	Norman	A lightning strike caused a fire in a large, approximately 3000 square foot, home on the west side of town. Heavy fire damage was sustained to the roof and attic. Heavy smoke damage also occurred to the second floor of the home.	\$110,000
<b>10 Jul 2006</b>	Norman	A lightning strike on the east side of town caused a fire in a home that destroyed the roof and attic. The second floor also sustained significant damage.	\$ 100,000
<b>31 Oct 2005</b>	Norman	Lightning struck a home on Cove Hollow Drive causing a fire on the back porch which spread into the house. The fire caused heavy damage to the porch, attic, roof, and kitchen. No injuries occurred.	\$ 150,000

## CLEVELAND COUNTY LIGHTNING EVENTS 2001 – April 2011

Data from National Climatic Data Center

Date	Location	Description	Est. Damage
10 Oct 2001	Norman	A man, sitting in a hot tub, received minor injuries to his bicep when lightning struck a water therapy center on NW 24th Street.	\$0
10 Oct. 2001	Norman	Lightning struck a house on Southeast 72nd Avenue, starting a fire that destroyed the home.	\$ 300,000.
20 Sep 2001	Norman	A house on Tarkington Drive was struck by lightning and burned completely.	\$ 180,000.

### Probability of Future Events

Considering past history, and the location of Oklahoma between the dry arid southwest and the moist air from the Gulf of Mexico, Cleveland County and participating jurisdictions have significant exposure to lightning events. Damage usually occurs to infrastructure such as power transmission lines and communications towers; however occasional damage can occur to structures. Early warning research is ongoing through the National Weather Service (NOAA) and other private organizations to improve warning and threat information for the public.

There will continue to be property damage and possibly even deaths due to thunderstorms containing lightning. The probability of future events for Cleveland County and participating jurisdictions is “**Likely.**”

### Vulnerability and Impact

During thunderstorms and particularly severe thunderstorms, people are often injured or killed by lightning. They are either struck directly or a nearby lightning strike causes injuries to people close by. Lightning is an underrated killer and second only to flood in regard to the number of weather-related deaths in the United States each year. The National Weather Service publication, *Storm Data*, records only six deaths from lightning strikes in Oklahoma between 1998 and 2008, and ranks the state 27<sup>th</sup> in the nation. According to the National Weather Service, lightning causes an average of 62 deaths and 300 injuries. In Cleveland County, lightning has been responsible for setting fires to buildings and displacing occupants through loss of business, employment, and homes all of which displaces the occupants.

The National Lightning Institute initiated a study to determine statistical information in lightning incidents: Those results follow:

## 1. Location of Incident:

40% Unreported.  
27% Open fields & recreation areas (not golf)  
14% under trees (not golf)  
8% Water-related (boating, fishing, swimming...)  
5% Golf/golf under trees  
3% Heavy equipment and machinery-related  
2.4% Telephone-related  
0.7% Radio, transmitter & antenna-related

2. Gender of victims = 84% male; 16% female
3. Months of most incidents = June 21%, July 30%, Aug 22%
4. Days of week of most incidents = Sun./Wed./Sat.
5. Time of day of most incidents = 2 PM to 6 PM
6. Number of victims = One (91%), two or more (9%)



Cleveland County officials and all of its jurisdiction and public school administrators consider all thunderstorms with lightning dangerous. Thunderstorms with lightning have damaged buildings and power supplies, and downed electrical lines causing power outages. Large trees often succumb to lightning strikes. Each year, lightning causes thousands of dollars in damages to homes, businesses, churches, barns, and other structures. Businesses are forced to close from power outages lose business. During long term outages of several days or weeks even the public schools will have to close. Because of

the deadly and destructive force of lightning, secondary effects from lightning are many. Examples include forest and grass fires; explosive steam conditions in masonry, trees struck by lightning sometimes fall and knock down power/telephone lines or fall on buildings, damaging them. Electrical appliances and electronics are often destroyed by lightning causing costly repairs or replacement. See Appendix C – Critical Facilities for more information on vulnerability and impacts of critical facilities at risk from lightning.

The public schools as well as Oklahoma University athletes on occasion experience hazardous conditions for players and spectators. During athletic events both



groups are in the open without cover and little warning of approaching thunderstorms although some do have lightning detectors. Even with warning, some athletic events, especially during

football season, draw very large crowds to Cleveland County. OU's stadium holds in excess of 80,000 people and is often at capacity.



As shown earlier in this section, lightning is an underrated killer and second only to flood in regard to the number of weather-related deaths in the United States each year. Public education is important in lessening the effects of lightning by encouraging residents to remain inside or in their cars during lightning events.

## Conclusion

Oklahoma has significant exposure to lightning events as does Cleveland County. Governmental and private properties are both susceptible to thunderstorm related damage. Damage most often occurs to infrastructure, such as power transmission lines and communications facilities or appliances although occasional damage does occur to structures. Early warning research is ongoing through the National Weather Service (NOAA) and other private organizations to improve warning time and threat information for the public.

## References

NSLI - National Lightning Safety Institute [http://www.lightningsafety.com/nlsi\\_lls.html](http://www.lightningsafety.com/nlsi_lls.html)

NWS - National Weather Service - Norman <http://www.srh.noaa.gov/oun/>

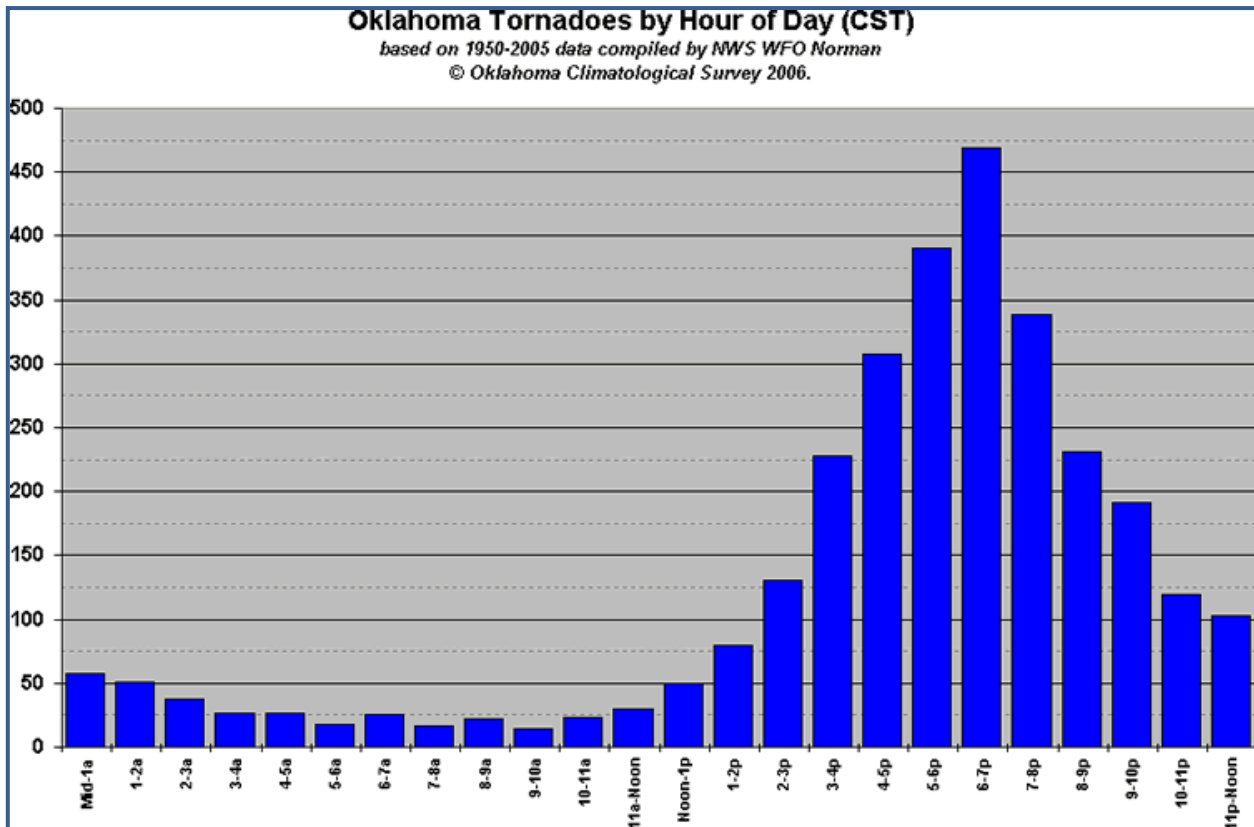
NCDC - National Climatic Data Center (<http://www.ncdc.noaa.gov/stormevents/>)

# HAZARD PROFILE

## Tornado – Cleveland County

A tornado is a violently rotating column of air, in contact with the ground, either pendant from a **cumuliform** cloud or underneath a cumuliform cloud, and often (but not always) visible as a funnel cloud.

A tornado is spawned by a thunderstorm which is produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado is a result of the high



wind velocity and wind-blown debris. Tornado season is generally April through June in Oklahoma, although tornadoes can occur at any time of year. They tend to occur in the afternoons and evenings: over 80 percent of all tornadoes strike between 3:00 PM and 9:00 PM, but can occur at any time of day or night.

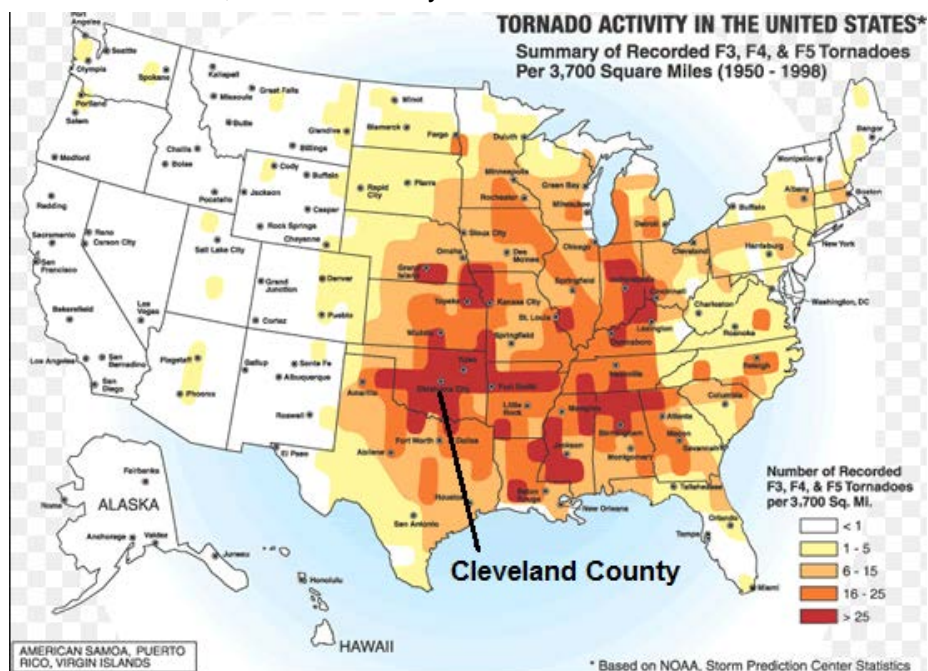
Tornadoes are found most frequently in the United States east of the Rocky Mountains. While most tornadoes (69%) have winds of less than 100 miles per hour, they can be much stronger. Although violent tornadoes (winds greater than 205 mph) account for only 2% of all tornadoes, they cause 70% of all tornado deaths.

Tornados can come one at a time, or in clusters, and they can vary greatly in length, width, direction of travel, and speed. They can leave a path 50 yards wide or over a mile wide. They may touch down for only a matter of seconds, or remain in contact with the ground for over an hour.

## Location

The entire state of Oklahoma, including Cleveland County, its unincorporated and incorporated communities, all public school districts, the University of Oklahoma and Moore/Norman Technology Center are all susceptible to the threat of tornados.

Cleveland County is located in what is commonly known as “Tornado Alley” and gets its share of tornados, experiencing 85 tornados between April, 1893 and May, 2010 (NWS Norman



data) probably due to its location. Due to the unique geography that brings together cooler air from the Rocky Mountains, tropical air from the Gulf of Mexico, and dry air from the southwest. When those ingredients come together in the right proportion tornadic thunderstorms develop.



On May 3, 1999 an EF5 tornado crossed the northern part of Cleveland County devastating the City of Moore and part of Cleveland County west and northeast of Moore. Since then, Cleveland County has experienced six EF4 – EF5 tornados, the latest occurring May 31, 2013. At the time of publication of this plan, complete statistics regarding that event have not been published.

## Extent

Tornado wind speeds are estimated after the fact based on the damage they produce. Tornadoes are categorized on a scale of EF0 (weakest) to EF5 (strongest) according to the Enhanced Fujita Scale; Cleveland County may experience any of these levels at any time during the year anywhere in the county.

The Fujita Scale was first proposed by Dr. Fujita in 1971. It is used by meteorologists to estimate the speed of winds after a tornado by studying the damage caused by the tornado to structures.

**Table 3-17**

F-Scale Number	Intensity Phrase	Wind Speed (mph)	FUJITA SCALE
			Type of Damage
<b>F0</b>	Gale tornado	40-72	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
<b>F1</b>	Moderate tornado	73-112	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
<b>F2</b>	Significant tornado	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
<b>F3</b>	Severe tornado	158-206	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
<b>F4</b>	Devastating tornado	207-260	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
<b>F5</b>	Incredible tornado	261-318	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel reinforced concrete structures badly damaged.

The enhanced Fujita Scale replaced the original scale on February 1, 2007 which made wind speed estimates more accurate than the previous scale. All events from that date are estimated using the enhanced scale. References to older storms will still rely on the original scale. The Enhanced Fujita Scale is shown below.

**Table 3-18**

Enhanced Fujita Category	Wind Speed (mph)	Enhanced Fujita (EF) Scale
		Potential Damage
EF0	65-85	<b>Light damage</b> - Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	<b>Moderate damage</b> - Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	<b>Considerable damage</b> - Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165	<b>Severe damage</b> - Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	<b>Devastating damage</b> - Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	<b>Incredible damage</b> - Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd.); high-rise buildings have significant structural deformation; incredible phenomena will occur.

Since the Fujita Scale is based on damage and not really wind speed or pressure, it is not perfect. The primary problem is that a tornado can only be measured in the Fujita Scale after it has occurred. Secondly, the tornado cannot be measured if there is no damage when the tornado occurs in an area of open terrain without any features to be damaged. Nonetheless, the Fujita Scale has proven to be a reliable measurement of the strength of a tornado and is used in this plan for that reason. Any tornado activity in Cleveland County is considered severe and reason for warning and appropriate actions by emergency response personnel.



F-1 or F-1 EF1 damage



F-2 or EF2 damage



F-3 or EF3 damage



F-4 or EF4 damage

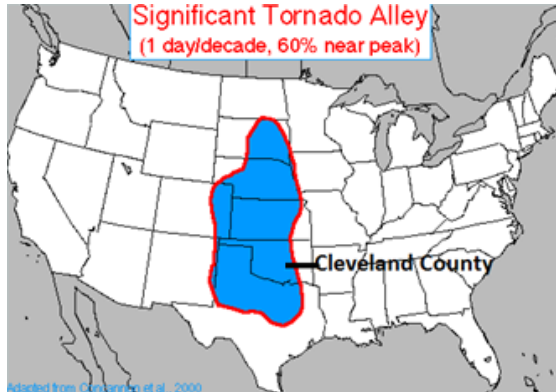


F-5 or EF5 damage



## Previous Occurrences

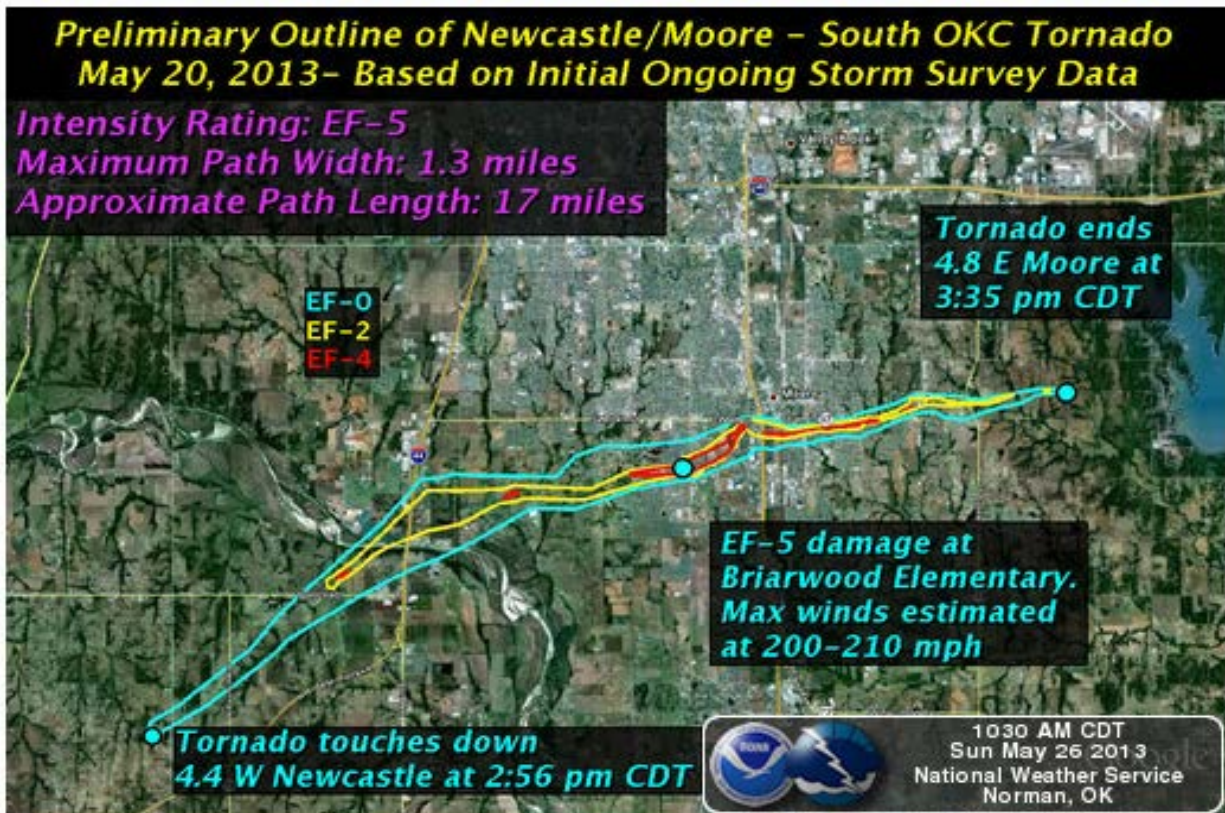
Moore has experienced 25 tornados since 1890. The May 3, 1999 tornado was one of the costliest natural disasters in US history and ranks among the deadliest in Oklahoma history with May 20, 2013 becoming equal or more devastating.



Oklahoma's distinction as an epicenter of Tornado Alley has become fairly well established, a result of the



sheer number of tornados it has experienced. Cleveland County is no exception. Since 2001, it has experienced 13 tornados including a cluster of seven tornados on May 10, 2010 and again on May 20, 2013 when an EF5 tornado cut across the City of Moore.




An increase in population spread increases the hazard posed by tornados. As the population grew, the threat of a tornado striking populated areas increased. The population growth is accompanied by the necessary infrastructure and by-products of civilization, all of which increase the potential loss in the event of a tornado.

**Table 3-19**

<b>CLEVELAND COUNTY TORNADO EVENTS</b> <b>2001 – May 2013</b> Sources: National Climatic Data Center National Weather Service – Norman Wikipedia		
<b>DATE</b>	<b>LOCATION</b>	<b>DESCRIPTION</b>
<b>31 May 2013</b>	Moore	<b>EF-0</b> Occurring at about the same time as the much larger El Reno storm, the Moore storm damage path was approximately from NW 5 <sup>th</sup> & Janeway to SE 4 <sup>th</sup> & Tower Drive. Damage ranged from trees, pole-mounted light fixtures and power lines, to damage to roofs and HVAC units. (Information from Moore Emergency Management)
<b>20 May 2013</b>	Moore	<b>EF5</b> - At 2:56 p.m. CDT, the tornado touched down roughly 4.4 miles (7.1 km) west of Newcastle in Grady County as an EF0. Tracking northeast through McClain County, the tornado rapidly intensified, attaining EF4 intensity within ten minutes and 4 miles (6.4 km) of touching down. This area of EF4 damage was in semi-rural residential subdivisions north of Newcastle (west-northwest of exit 108 on Interstate 44 just outside of a business area) and was very brief. By 3:01 p.m. CDT, a second more strongly worded warning was issued for the area. A tornado emergency was declared for southern Oklahoma City and Moore as storm spotters confirmed a large and violent tornado approaching the area. As the tornado crossed the Canadian River into Cleveland County, a decommissioned U.S. 62/U.S. 277 bridge was severely damaged and had to be demolished after the tornado ripped part of it from its mount and scattered it across Interstate 44. The tornado then moved directly toward South Oklahoma City and Moore, roughly following Southwest 149th Street. At this point it began to grow rapidly in width, and a second brief area of EF4 damage was observed just east of Interstate 44. The tornado tracked through mostly rural areas of extreme southern parts of South Oklahoma City and southwest Moore at EF2 to EF3-strength before entering larger residential areas near Western Avenue. There, two larger instances of EF4-strength damage occurred just west of Interstate 35. The Orr Family Farm, where between 75 and 100 horses were killed, took a direct hit from the first of the two swaths, and several homes and structures on the property were swept away. Nearby, Briarwood Elementary School also took a direct hit (although the school itself was found to have been destroyed by a very brief stint of EF5-strength winds, along with the very close surrounding subdivisions, where a few homes were swept away). One woman was killed in her home near the school. Winds from the tornado at this point (albeit briefly) were estimated to be 200 to 210 mph (320 to 340 km/h).

## CLEVELAND COUNTY TORNADO EVENTS 2001 – May 2013

Sources: National Climatic Data Center  
National Weather Service – Norman  
Wikipedia

DATE	LOCATION	DESCRIPTION
		<p>The tornado quickly lost the peak EF5 strength and weakened to EF4. It then caused heavy damage to Plaza Towers Elementary School, where seven children were killed. Many houses in the area (along South Santa Fe Avenue and surrounding streets) were destroyed, with several being completely flattened or reduced to bare slabs. In one of these houses (a block away from Plaza Towers), a woman was killed as she tried to seek shelter in a closet. That swath of EF4 damage also included an area on the west side of Interstate 35, with Moore Medical Center and the Moore Warren Theatre being heavily damaged (the concrete and reinforced steel-constructed movie theater suffered mainly external damage to its roof and marquee). At least a dozen cars were piled up against the front entrance of the medical center. A bowling alley in the area was destroyed, and a 7-Eleven was completely flattened, with four people killed inside (including one infant). The nearby Moore Cemetery was heavily damaged as well. The tornado then crossed Interstate 35 at the center of town just south of 4th Street (where cars were tossed across the interstate and littered through the median), abruptly shrank in size, and moved to the east side of Moore, where many more homes were either damaged or destroyed. The EF4 damage continued on the east side of the interstate (despite the rapid decrease in size) before the tornado started to weaken near the intersection of Southeast 4th Street and South Sunnyside Road. The tornado continued briefly at EF2 to EF3-strength before becoming a thin rope tornado and rapidly weakening. It then dissipated about 4.8 miles (7.7 km) east of Moore around 3:35 p.m. The tornado left a trail of destruction 17 miles (23 km) long by 1.3 miles (2 km) wide. <b>Early damage estimates exceed two billion dollars. FATALITIES: 51 INJURED: 350</b></p> 
13 April 2012	Norman and SW Cleveland County	<p><b>EF1</b> - The tornado developed just west of the Canadian River, north of the intersection of Santa Fe Avenue and SE 35th street at 3:59 pm CDT, and moved east-northeast toward the city of Norman. The tornado entered the southwest side of Norman and crossed Interstate 35 (I-35) north of W. Lindsey Street. EF-1 damage was done on either side of the interstate as the tornado began moving more toward the northeast. Additional EF-1 damage was reported north of Main Street, between Lahoma Avenue and Peters Avenue. The tornado finally lifted near the intersection NE 12th Avenue and Robinson Street. There was damage to Jackson Elementary School on Wylie Road just north of Boyd Avenue and roof damage reported all across Norman from Berry Road to Porter Avenue, fire officials said. There was some damage at Norman High School. Several buildings, including one that used to house a paint store, were damaged near downtown. <b>Injuries: 19 treated for minor</b></p>

## CLEVELAND COUNTY TORNADO EVENTS 2001 – May 2013

Sources: National Climatic Data Center  
National Weather Service – Norman  
Wikipedia

DATE	LOCATION	DESCRIPTION
		<b>injuries at Norman Hospital</b>
<b>24 May 2011</b>	Grady, McClain and Cleveland County	<b>EF4</b> - 2 S Chickasha - SW Oklahoma City (near SW 149th and Portland inside Cleveland County). No other information available.
<b>10 May 2010</b>	Slaughterville and 4 to 5 miles E of Lake Thunderbird Dam	<b>EF2</b> - Cleveland County portion of tornado #J3. The tornado developed west of SE 120th Avenue between Maguire Road and Cemetery Road. The tornado moved through a mobile home park northeast of SE 120th Avenue and Maguire Road causing significant damage to a number of the mobile homes and injuring 2 people. The tornado continue to cause tree damage as it moved northeast, then heavily damaged the Country Boy IGA grocery store and service station on State Highway 9 to the east of Lake Thunderbird. <b>INJURIES: 3</b>
<b>10 Feb 2010</b>	4 miles NNE of Noble	<b>EF1</b> - This anti-cyclonic tornado developed in the southern portion of Norman south of State Highway 9 near Chautauqua Avenue and to the southwest of tornado #J1. The tornado moved east-northeast causing roof, tree and fence damage to neighborhoods along Cedar Lane, especially after crossing U.S. Highway 77. The tornado continued to produce tree damage as it moved east and east-northeast. It crossed State Highway 9 to the east of SE 48th Avenue and moved into a neighborhood to the northwest of SE 60th Avenue and Highway 9 a few minutes after tornado #J1 had caused damage in this same neighborhood. The tornado dissipated near SE 60th Avenue.
<b>10 May 2010</b>	5 miles ENE of Lake Thunderbird Dam	<b>EF4</b> - this tornado crossed Lake Thunderbird, severely damaging two campgrounds and the marina where about 300 boats were docked. The most severe damage occurred from the Little Axe School to the Cleveland/Pottawatomie county line. Trees were stripped of some bark and branches. Large objects were thrown considerable distances, including some concrete pillars. The metal bleachers near the school were tossed or rolled several hundred yards. Some appliances were also lofted, as a dryer was found about 50 feet up in a tree. Considerable structural damage also occurred, as some foundation homes were mostly destroyed. In addition to the damage, one person lost their life as a result of the tornado. <b>Fatalities: 1, Injuries: 32</b>
<b>10 May 2010</b>	4 miles WSW of Stanley Draper Lake	<b>EF1</b> - Roof damage occurred at a restaurant near SE 34th Street and Sooner Road in southeast Moore. The tornado moved east-northeast across Sooner Road into a neighborhood, producing tree and roof damage before dissipating.
<b>10 May 2010</b>	4 miles ENE of Moore	<b>EF1</b> - Power poles and a house were damaged near and just east of Broadway Street and Eastern Avenue in the southern portion of Moore. As the tornado moved northeast, most of the roof was removed from a mobile home and trees were damaged west of Sunnyslane Road north of NE 12th Street, and shingle damage occurred on a house just east of Sunnyslane Road.
<b>10 May 2010</b>	4 miles NE of Stanley Draper	<b>F3</b> - This long-tracked and devastating tornado developed west of I-35, northwest of Max Westheimer airport. Widespread tree, power

## CLEVELAND COUNTY TORNADO EVENTS 2001 – May 2013

Sources: National Climatic Data Center  
National Weather Service – Norman  
Wikipedia

DATE	LOCATION	DESCRIPTION
	Lake	line/pole damage was reported from near I-35 to the east side of Stanley Draper Lake. Several homes also sustained damage, mainly with mostly roofs receiving significant damage, and some siding was ripped off. Several fences were also knocked down as the tornado moved northeast. From the east side of Lake Stanley Draper, near Hiwassee Road and SE 89th Street, to just south of Harrah, the damage path became more severe and focused. The tree damage became more severe, breaking at various heights of the tree or being uprooted. Walls of homes collapsed, and debris from the homes scattered in all directions. Several 2x4's punctured roofs and ceilings over numerous structures. A few mobile homes in this area were also completely destroyed. Where the tornado crossed I-40, a gas station and drive-in restaurant sustained up to EF3 damage. <b>Injuries: 20</b>
12 Jun 2009	4 miles ESE of Norman	<b>EF1</b> - The tornado developed at the southern edge of the Summit Lakes addition just southeast of 24th Avenue SE and Alameda Street, and then moved through the Highland Hills addition just northwest of 48th Avenue SE and Lindsey Street. Numerous trees were damaged and a small number of homes received minor roof damage.
13 May 2009	3 miles NNW of Stanley Draper Lake	<b>EF0-</b> The tornado developed over the northwest side of lake and moved south-southeast along the western shore. A boat dock was damaged and trees and other small structures sustained minor damage.
07 May 2008	3 miles WNW of Noble	<b>EF0</b> - The tornado continued moving northeast from McClain county. Mostly tree and fence damage was reported along the tornadoes path. Little other damage was reported. <b>Property Damage estimated \$10,000</b>
09 Jun 2004	8 miles ESE of Moore	<b>EF0</b> - A brief tornado damaged trees on the southeast side of Lake Stanley Draper between South Westminster Road and East Stanley Draper Drive near Southeast 140th Street. <b>Property Damage estimated \$5,000</b>
08 May 2003	3 miles NNE of Moore	<b>EF4</b> - The tornado began in the area of Northwest 5th Street and Santa Fe Avenue in Moore, near the Church of Latter Day Saints. Damage intensities increased quickly to F2 and isolated F3 as the tornado, initially narrow, moved east along 5th street. Substantial structural damage in this initial touchdown area was confined to homes on the north side of 5th Street, just east of Santa Fe. Damage intensity increased to F3 as the tornado approached 12th Street between Janeway and Interstate 35. A commercial building on the south side of 12th suffered F3 damage, as did several homes on the north side of 12th Street at City Avenue where several homes lost most of their outside walls. Maximum damage intensity on Sunrise Avenue (north of 12th and one block east of City Ave.) was rated strong F2 and consisted mostly of homes being partially or totally unroofed. Several vehicles were tossed into front yards, and in one case nearly into the front of a home. The worst damage produced within the city of Moore was as the tornado approached west sides of Interstate 35, just north of 12th Street. Damage in this area included major damage to two hotels, the First Christian Church, the Young

## CLEVELAND COUNTY TORNADO EVENTS 2001 – May 2013

Sources: National Climatic Data Center  
National Weather Service – Norman  
Wikipedia

DATE	LOCATION	DESCRIPTION
		Child Development Center, a Project Head Start building, an office building, and several restaurants. The church, child care center, and office building were leveled. The two hotels, both two-story, had their second floors partially or totally removed by the tornado. <b>Injuries: 45; Property damage estimated \$210,000,000</b>
08 May 2003	4 miles WSW of Moore	<b>EFO</b> - The tornado was viewed by many residents west of Moore and was also caught on video by several storm chasers. Structural damage was limited mostly to fences, awnings, outdoor recreational equipment, and at least one outdoor satellite dish. Several canoes from a back-yard pond were picked up and deposited 100 feet or more from their point of origin. A pontoon boat on a trailer was also overturned. <b>Property damage estimated \$500,000</b>



May 20, 2013 tornado



Briarwood Elementary School



Plaza Towers Elementary School



May 31, 2013 tornado



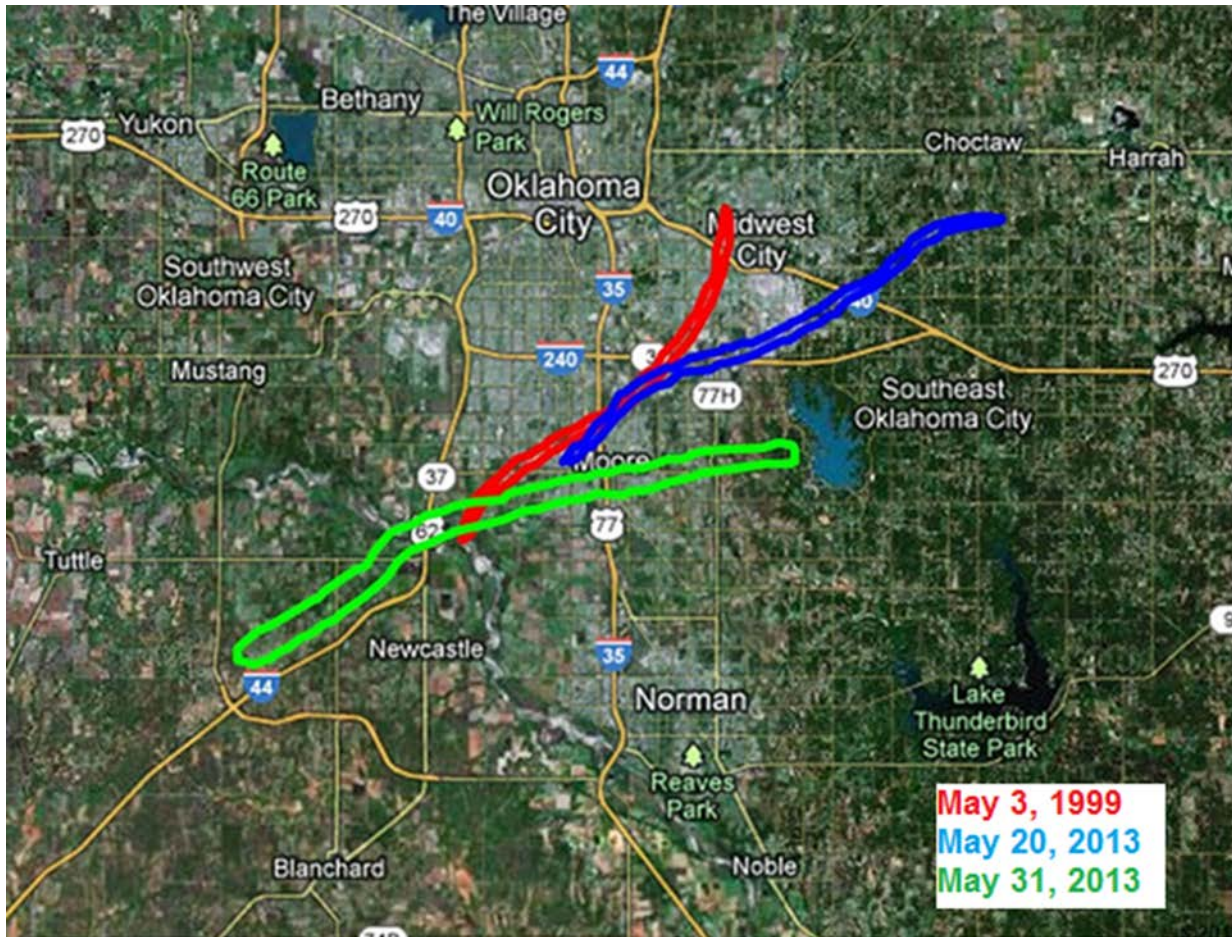


May 20 2013 May Tornado path with EF ratings.



Source: U.S. Census Bureau, National Weather Service

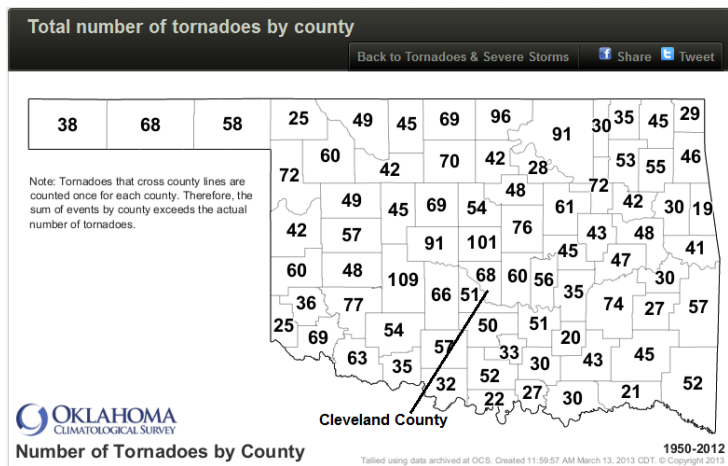




## Probability of Future Events

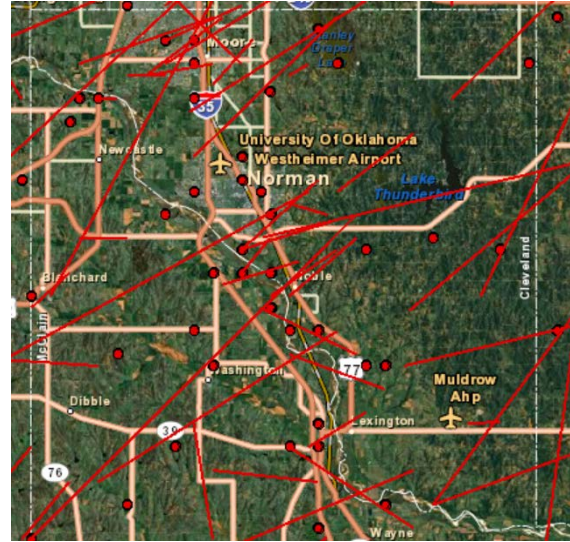
Based on the location of Oklahoma between the warm humid air from the Gulf of Mexico, the arid hot air from New Mexico and the cool air from the Rocky Mountains, conditions are right, as proven by the history of tornados in Oklahoma and in Cleveland County.

On the map shown here prepared by the Oklahoma Climatological Survey (latest map available), Cleveland County has experienced 68 tornado's since 1950 (does not include data after 2012 which would add two tornados to Cleveland County.)





Fortunately, better construction practices can limit the damage potential from all but the most violent tornados. The residences and businesses of today are more likely to withstand the damaging winds of weaker tornados than those structures built fifty years ago, although there are a lot of those type structures in Cleveland County. The inclusion of safe rooms, below ground storm shelters, hurricane straps, and foundation anchor bolts in current construction plans has helped reduce the hazard to both life and property.



Preliminary Path of the April 13, 2012 Norman, Oklahoma Tornado

The National Weather Service is also taking steps to improve warning time. The next step in NOAA's long-time weather radars is phased array radar. Available in the next few years, these radars using electronic controls of beams and frequencies can scan more quickly, thereby increasing lead times for tornado warnings.

Public input and review by the Cleveland County Hazard Mitigation Planning Team agree that, although Cleveland County is not prone to as many tornado events as some areas of the state, it is in the top 14 percent of the 77 counties in the state. The potential for future tornados in Cleveland County is “**Likely.**”

## Vulnerability and Impact

Sixty-nine percent of all tornados are considered weak; over 82% of all tornado deaths are due to violent tornados (EF4-EF5), even though only 2% of tornados fall into that category. Tornado deaths by county are dominated by singular events, and largely a result of significant (EF2-EF4) tornados. The greatest vulnerability to be faced would be in the event of an EF-3 or larger tornado directly hitting the City of Norman or Moore. Because Norman is the largest city in the county and a large part of the economic base for Cleveland County is in Norman, substantial

damage would occur to the overall economy of Cleveland County. The damage to infrastructure would be enormous with lost power, water, sewer, gas, and communications. Many key businesses including financial institutions, which the residents of the rest of the county depend upon, would be damaged or destroyed and closed for an undetermined period of time. Even short-term closures can wreak havoc for citizens as well as businesses of all types and sizes. Because of such significant damage events, many insurers have ceased to write policies in the State of Oklahoma. Substantial increases in rates by those remaining insurers has a significant financial impact on citizens and businesses.

The State Highways 9, 37, 62, 76, 77, 130, and 277, as well as the major north/south byway, Interstate 35, could be blocked for possibly weeks. This would interfere not only with the flow of commerce throughout Oklahoma and the United States. Locally it would create major problems for public school bus routes, even if the school building was undamaged. Alternate transportation routes would have to be found. However, the May 2013 tornados which struck Oklahoma destroyed schools in Moore and damaged the Little Axe school in rural northeast Cleveland County. Repairs and/or reconstruction can tax local budgets and create difficulty for the schools to comply with state laws regarding the number of education days in a school year. All of the school districts participating in this plan face these same issues when dealing with the aftermath of tornados. In planning their school year calendars, they must have contingency plans for these events.

Schools, hospitals, grocery stores and other critical and economically important facilities would be damaged and/or closed for extended periods. Many of the businesses that were damaged or destroyed would remain closed until repairs or replacement could occur. Employment would be affected because of businesses closing and laying off employees due to the loss of business. Some businesses never re-open after a tornado. Some residents leave and never return, leaving their property in the post tornado condition, causing a major health concern and the need for local government to clean it up.

Damage to the United States Post Office facilities in any of the communities can interfere with receipt and delivery of critical information and funding documents for both citizens and businesses as well as the school districts, including MNTC and the University of Oklahoma. Although technology and the internet have a vital importance in doing business, most businesses still rely upon the postal system to deliver and receive communications, billing

statements and receipts. For residents whose homes are severely damaged or destroyed, they must often find additional ways to receive their mail if their home is uninhabitable for any period of time.

Many roads and bridges could be damaged or at the least blocked by debris. This would greatly affect the heavy traffic throughout most of Cleveland County. Alternate routes would have to be found which could further cause traffic problems due to roads having to be used that were not developed for that kind of traffic. Continuity of government would be severely limited and emergency response would be greatly hindered. See Appendix C – Critical Facilities for more information on



vulnerability and impacts of critical facilities at risk from a tornado. People would lose their homes and be displaced from their primary residence with high numbers of injuries and fatalities possible. Mobile homes and frame structures are the most vulnerable even with preventative actions. Some people never return, leaving empty or debris riddled lots for someone else to resolve. Power and water outages occur with most tornados whether in urban or rural areas often causing food spoilage and sanitation problems for residents. These situations may remain for weeks and months.

Some residents in Cleveland County have built safe rooms or underground tornado shelters. Many others throughout the rest of the county are interested in protecting their family and schools are interested in protecting their students and staff by building safe rooms.

## Conclusions

Tornados are a part of life in Oklahoma, and residents, both rural and urban, must be aware of actions they can take to protect their family from tornados. Schools in Cleveland County are especially in need of shelter for their staff and students. Some schools in the county, particularly those in the City of Moore have already added safe areas for their students and staff. Other schools, particularly the smaller districts still need safe areas to be developed. The citizens in Cleveland County, because of the number of major tornados that have occurred in the county are better prepared for tornados than even most people in Oklahoma. There are new people moving to Cleveland County who need to get information on how to protect their families from any tornado they may experience. Mitigation planning can reduce the effects these storms have on the residents of Cleveland County.

## References

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(NCDC) National Climatic Data Center (<http://www.ncdc.noaa.gov/stormevents/>)

(NWS) National Weather Service – Norman <http://www.srh.noaa.gov/oun/>

(OCS)Oklahoma Climatological Survey (<http://climate.mesonet.org/>)

## HAZARD PROFILE

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### **Wildfire – Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville**

A wildfire is often a raging inferno that rapidly spreads out of control. It happens most frequently in the summer and fall, when the brush is dry and flames can move unchecked through wooded or heavily grassed areas. The fire often begins unnoticed and spreads quickly, lighting brush, trees and homes. It may be started by a campfire that was not doused properly, a tossed cigarette, burning debris, lightning or arson.



Wildfire is a natural part of Oklahoma's ecosystem. Before the area around Cleveland County was settled, wildfires, usually started by lightning, ran across the plains, or through the forests replenishing nutrients to the soils and controlling invasive plant species. With settlement, however, the interaction of wildfire and the environment has changed. Now, people

and structures are at-risk from flames spreading across the grasslands and wooded areas in Cleveland County. Today, communities lie alongside wild lands, creating an urban-wild land interface that is at risk of uncontrolled burns.

The development of urban-wildland interfaces is part of a growing national problem. Fire losses and suppression costs have skyrocketed over the past decade. As homes and businesses have edged into valleys, woodlands, prairies and canyons, often far away from available water sources to extinguish flames, costs of fire control have increased for local fire departments. Many of the fire departments in Cleveland County are volunteer departments and equipment is expensive to keep operational.

**Weather** plays a major role in the birth, growth and death of a wildfire. Drought leads to extremely favorable conditions for wildfires, as do humidity, temperature, and wind. The combination of wind, temperature, and humidity affects how fast wildland fires can spread. These combinations will change throughout the day and night, and the presence of fire will impact each factor, causing even greater variation.

## Location

The CCHMPT believes that all of Cleveland County, including the unincorporated communities and the incorporated communities, is susceptible to the threat of grass/Wildfire.



Much of rural Cleveland County has an abundance of cedar trees which are extremely flammable when exposed to flames. When heavily wooded areas are found very close to structures, those structures are vulnerable to wildfire due to the heat and intensity of those type fires. Unfortunately some small communities are heavily wooded and no Wildland Urban Interface is possible. These few unincorporated communities are small and wildfire is likely to do more extensive damage since there are only a few structures in those communities, mostly older frame and mobile homes and often in heavily wooded areas with limited fire protection. The Little Axe Public School campus is of special concern due to the wooded areas close by. All of the school campuses located within the planning area have well maintained grounds and have little or no threat to school buildings from wild land fire (wildfire). Some of the campuses are located close to wild land areas but buildings are isolated by roads, drives, parking lots, ball fields, and etc. Aerial photos are provided in Appendix B of all school campuses showing their exposure to wild land fuels.

### **Little Axe Public Schools:**



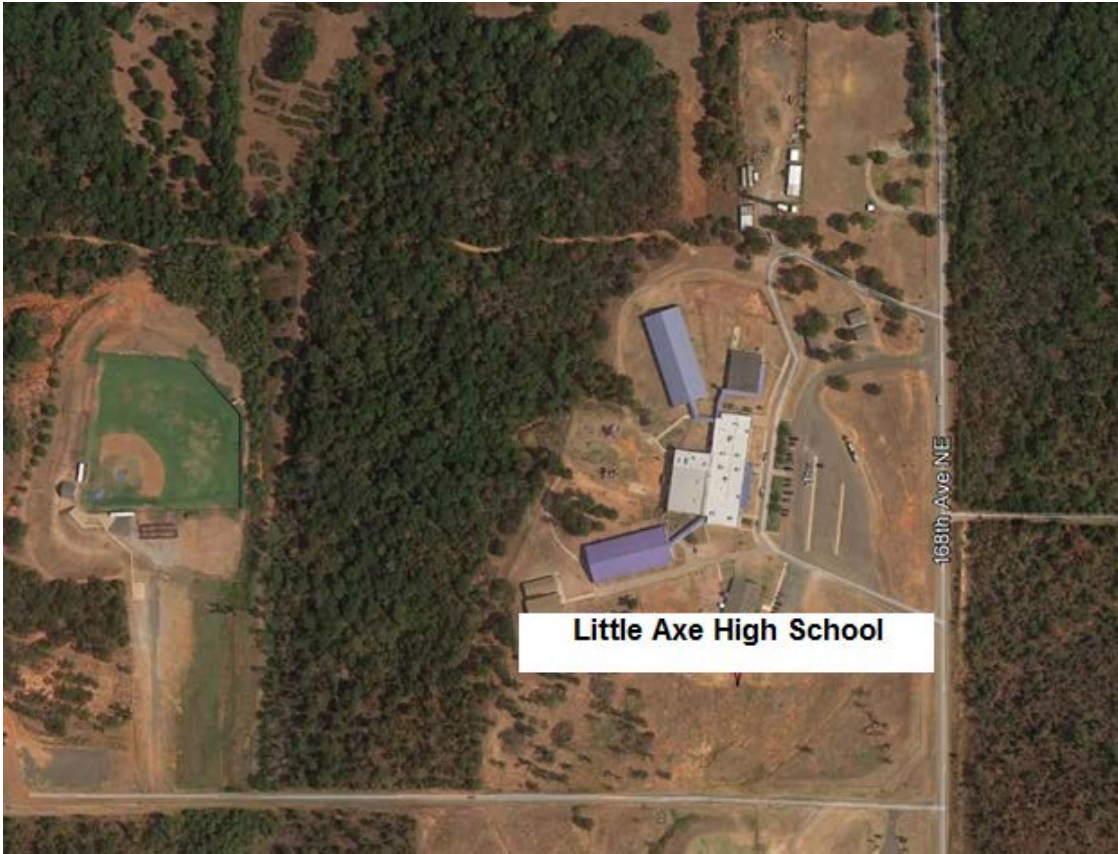


Trees surround the elementary and middle schools. Most of the campuses are cleared of trees around the building. As shown below, there are some trees on the same side of the street as the school building which could possibly be ignited from a fire at street side immediately east of the school. Smoke could also be an issue particularly for students or staff with asthma or allergies.



### **Little Axe High School:**

The high school is well cleared of trees and is far from the main road. Although there are trees on parts of the campus they present little threat to the buildings.



The probability of wildfire near the Little Axe school buildings is **POSSIBLE**. The school buildings would likely not be involved.



### **Robin Hill School:**

Although Robin Hill School is a rural school; there are no trees or high grass that would be anticipated to threaten the school buildings.



The probability of wildfire near the Robin Hill school buildings is **Unlikely**.

## Extent

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Cleveland County and participating cities and towns experiences a variety of wildfire conditions found in the Keetch-Byram Drought Index. Spring usually centers on the 0-200 rating while July through December are usually drier and depending on fuel and moisture usually will rate in the 400-600 range. During extreme dry and/or drought times such as during 2011, Cleveland County and participating cities and towns will be rated at 600-800. School campuses have generally the same rating as the jurisdiction they are located within except the campuses are well maintained and are less inclined to experience a wildfire event.

There are three different classes of wildland or wildfires. A surface fire is the most common type in Oklahoma and in Cleveland County.

**Surface fire** is the most common type in Cleveland County. Surface fires usually move rapidly through an area, and do not consume the entire organic layer. Moisture in the organic horizons often prevents ignition of the humus layer, and protects the soil and soil-inhabiting organisms from the heat. Anything above 400 on the KBDI index is considered extreme and cause for high fire danger warnings.

**Ground fires** normally smolder or creep slowly through the litter and humus layers, consuming all or most of the organic cover, and exposing mineral soil or underlying rock. These fires usually only occur during periods of protracted drought when the entire soil organic layer may dry sufficiently

**Crown fires** occur when surface or ground fires ignite brush piles and dead or living lower branches of standing trees, tree crowns becomes engulfed in flames, and the fire spreads to nearby trees. Crown fires occur in forests during periods of drought and low relative humidity, particularly in areas with heavy accumulations small trees and bushes below the level of the taller trees in the forest. Crown fires generate tremendous heat that rises in a strong convection column, drawing in brisk surface winds that fan the flames even more. Heated air blowing across the flames also warms and dries the fuels ahead of the fire, and releases volatile gases from vegetation ahead of the flaming front.



Surface Fire



Ground Fire



Crown Fire

**Keetch-Byram Drought Index, fire danger rating system:** The Keetch-Byram Drought Index (KBDI) is basically a mathematical system for relating current and recent weather conditions to potential or expected fire behavior. This system was originally developed for the southeastern United States and is based primarily on recent rainfall patterns.

The KBDI is the most widely used drought index system by fire managers in the south. It is also one of the only drought index systems specifically developed to equate the effects of drought with potential fire activities. The result of this system is a drought index number ranging from 0 to 800 that accurately describes the amount of moisture that is missing. A rating of zero defines the point where there is no moisture deficiency and 800 is the maximum drought possible. The inputs for KBDI are weather station latitude, mean annual precipitation, maximum dry bulb temperature, and the last 24 hours of rainfall. KBDI levels and its relationship to expected fire potential are reflected in the following table:

**Table 3-20**

<b>The Keetch-Byram Drought Index (KBDI) fire danger rating system</b>	
<b>0 - 200</b>	Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
<b>200 - 400</b>	Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smoke to carry into and possibly through the night.
<b>400 - 600</b>	Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
<b>600 - 800</b>	Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn thorough the night and heavier fuels will actively burn and contribute to fire intensity

The range of the index is determined by assuming that there is 8 inches of moisture in a saturated soil that is readily available to the vegetation. For different soil types, the depth of soil required to hold 8 inches of moisture varies (loam=30", clay=25" and sand=80"). A prolonged drought (high KBDI) influences fire intensity largely because more fuel is available for combustion (i.e. fuels have a lower moisture content). In addition, the drying of organic material in the soil can lead to increased difficulty in fire suppression. Cleveland County officials consider any wildland fire as a threat to lives and property however conditions indicating a 400 on the fire rating system would be a severe threat and appropriate warnings would be enacted through local media.

## **Previous Occurrences**

Cleveland County experiences Wildland fires monthly. The worst wildfire season in recent history was during the 2005-2006 summer through the spring months although actual property damage and area was during 2012 when there were According to local officials, 2012 was even more severe (Fire Marshall information unavailable) when there were 15 square miles, 9,000

acres and over 200 homes lost. There was one death. (See Slaughterville Wildfire). During those extremely dry periods, Cleveland County was rated at 600-800 on the KBDI.

Wildfires are usually signaled by dense smoke that fills the area for miles around. Wildfires often begin unnoticed and spread quickly, igniting brush, trees, and homes. Below is the history of Cleveland County grass and wildfire fires, crop fires and wildfires. Some of the more severe years for Wildland fires with acres loss and damage costs also coincide with drought years of 1998, 2005 and 2006, and 2011. Cedar Country Fire Department is the only fire department in Cleveland County outside incorporated city limits.

**Table 3-21**

**2010 - No report available**

<b>Cleveland County Wildfire Events</b>												
<b>2005-2009 (only data available)</b>												
<b>Fire Dept.</b>	<b>Number of Events</b>						<b>Approx. # Acres Lost</b>					
	2005	2006	2007	2008	2009	2011	2005	2006	2007	2008	2009	2011
<b>Cedar Country FD</b>	24	48	4	14	27	42	356	580	125	30	2706	156

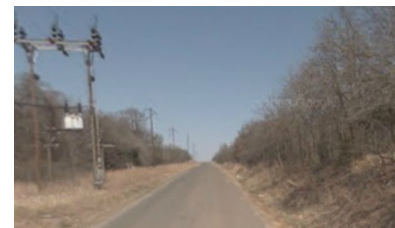
### **Probability of Future Events**

Much of the Cleveland County rural area is protected by the Cedar Country Volunteer Fire Department although areas around the incorporated communities are protected largely by those communities. As long as there are citizens located in the rural areas and as long as there are roads and highways in the rural areas there will be a threat of wildfire. Of particular threat would be the recreational areas around Stanley Draper (Oklahoma City Fire area) and Lake Thunderbird (Norman Fire area). The probability of future wildland fire events in Cleveland County is “**Likely**”.

### **TOWN OF ETOWAH**

#### **LOCATION**

The Town of Etowah is covered with prime wildfire fuels including cedar trees. With a population of 92, there are few structures in Etowah. Many of those are older frame structures or mobile homes. A few farm buildings and a few small businesses also dot the area. Most are in wooded areas with trees extremely close to many of the buildings. Wildfire is certainly a threat to Etowah.



**North of McGuire Rd on Dobbs**

Road (180<sup>th</sup>)



Kendall Lane



South of Maguire on Dobbs Road (180<sup>th</sup>)



Cemetery Road west of Bounbonais Creek Road

Town of Etowah



There is no wildland urban interface area in Etowah. There are only a few structures in the community of Etowah and all are at threat of wildfire. There is no urban area, thus no urban interface and the trees are close to structures which would cause the structures to burn if a wildfire occurred.

Town of Etowah Wildfire/grassfire Events 2004-2011 (only data available- includes unincorporated Cleveland County) State Fire Marshalls office												
Fire Dept.	Number of Events						Approx. # Acres Lost					
	2005	2006	2007	2008	2009	2011	2005	2006	2007	2008	2009	2011
Cedar Country FD	24	48	4	14	27	44	356	580	125	30	2706	156

No information available for 2010.

### Probability of Future Events

Much of the Cleveland County rural area is protected by the Cedar Country Volunteer Fire Department including the Town of Etowah. They do not have a Fire Department within the community. Oklahoma City, Norman and Moore Fire Departments also assist with fires when requested. The probability of future wildland fire events in Etowah is “Likely”.

## CITY OF LEXINGTON

### LOCATION

City of Lexington has a threat of grassfire and wildfire although it does not appear to be as severe a threat as some communities near them.

The City of Lexington experiences primarily grass fires though most are small and inconsequential with little or no property damage.

Table 3-21

No report for 2010

Town of Lexington Wildfire Events 2005-2011 (only data available)												
Fire Dept.	Number of Events						Approx. # Acres Lost					
	2005	2006	2007	2008	2009	2011	2005	2006	2007	2008	2009	2011
Lexington FD	6	12	4	27	NR	14	356	580	125	30	NR	117

The City of Lexington has experienced fires over the past six years but they have been contained and did not result in massive fires. This is due to dedicated firefighters in Lexington. It should be noted that the Lexington Fire Department also assists neighboring communities in fighting wildland fires when requested.



Numbers on the previous map relate to the following location pictures in Lexington.



(1) This photo is from the northwest part of Lexington. Prior to harvest, fields may become dry enough to burn depending on the crop grown.



(2) In the southeast part of town again there are few wildfire threat fuels.

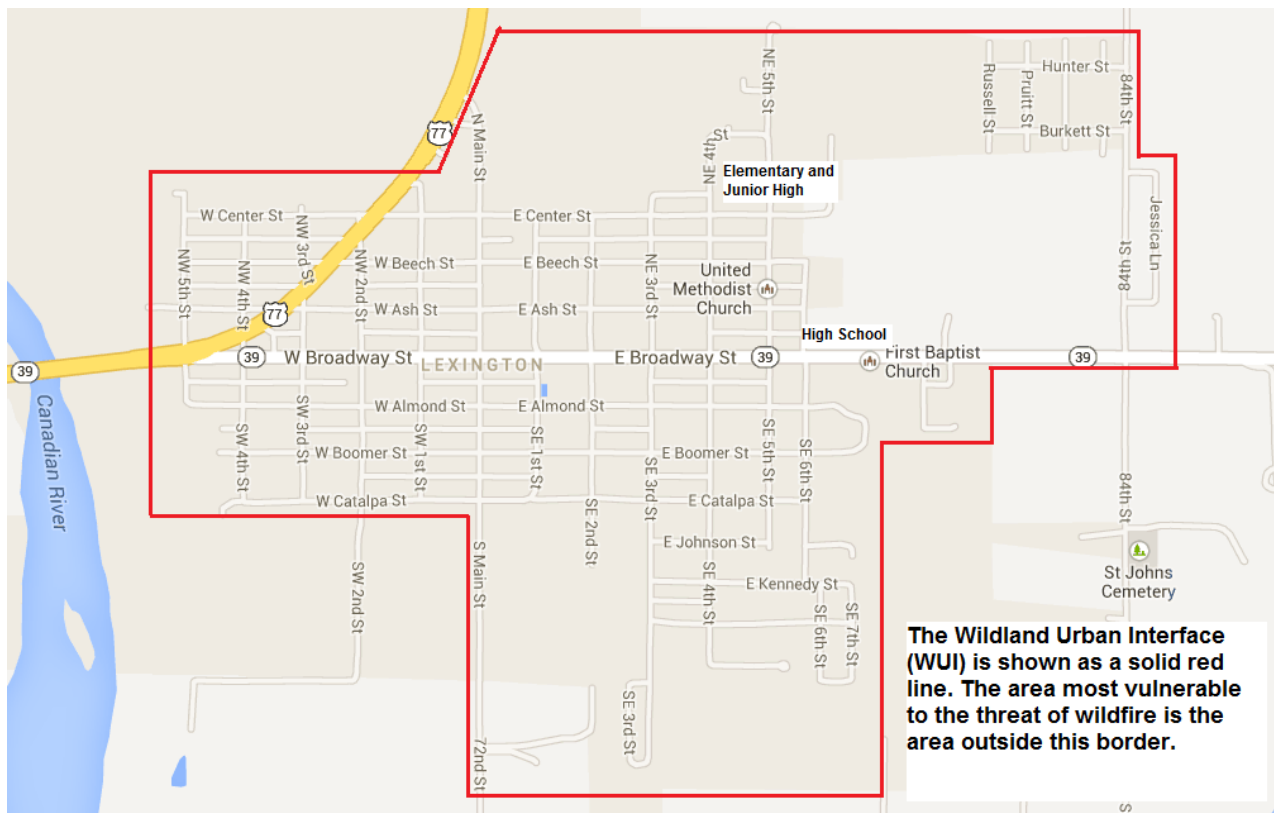




- (3) In the northeast, it is the same situation. This photo is looking back toward town and shows the general lack of fuels. During dry periods however, the fire threat could increase.

### **WILDLAND URBAN INTERFACE:**

*The term wildland-urban interface (WUI) has been used for more than two decades to suggest an area where structures (usually homes) are in or near wildlands (forests or rangelands). There is no standard WUI definition. However, the definition listed in a 2001 Federal Register notice is commonly referenced the urban-wildland interface community exists where humans and their development meet or intermix with wildland fuel.*



## Lexington Public School District

### LOCATION

The City of Lexington has a very limited threat of grassfire and wildfire although it does not appear to be as severe a threat as some communities near them. The City of Lexington experiences primarily isolated grass fires although most are small and inconsequential with little or no property damage.

Located within the city limits, Lexington Public schools are generally considered to be at very low risk of the wildfire threat. The grounds around the buildings are covered with low grass, pavement and graveled areas. The grounds are cleared of extensive tree growth; limited trees are located on the school grounds, but are trimmed away from the buildings.



**#1 – Lexington Elementary/Junior High**



**#2 – Lexington High School**



**#3 – Aerial view of both Lexington Public Schools**

## Probability of Future Events

The City of Lexington has a Fire Department, mostly volunteer. Lexington’s wildfire threat is minimal due to a lack of heavily wooded areas within their jurisdiction. The primary threat is grassfire which have been quickly put out. The probability of future wildland fire events in Lexington and the public schools in Lexington is “**Unlikely**”. Grass fires are “**Likely**”

## THE CITY OF MOORE

### Location

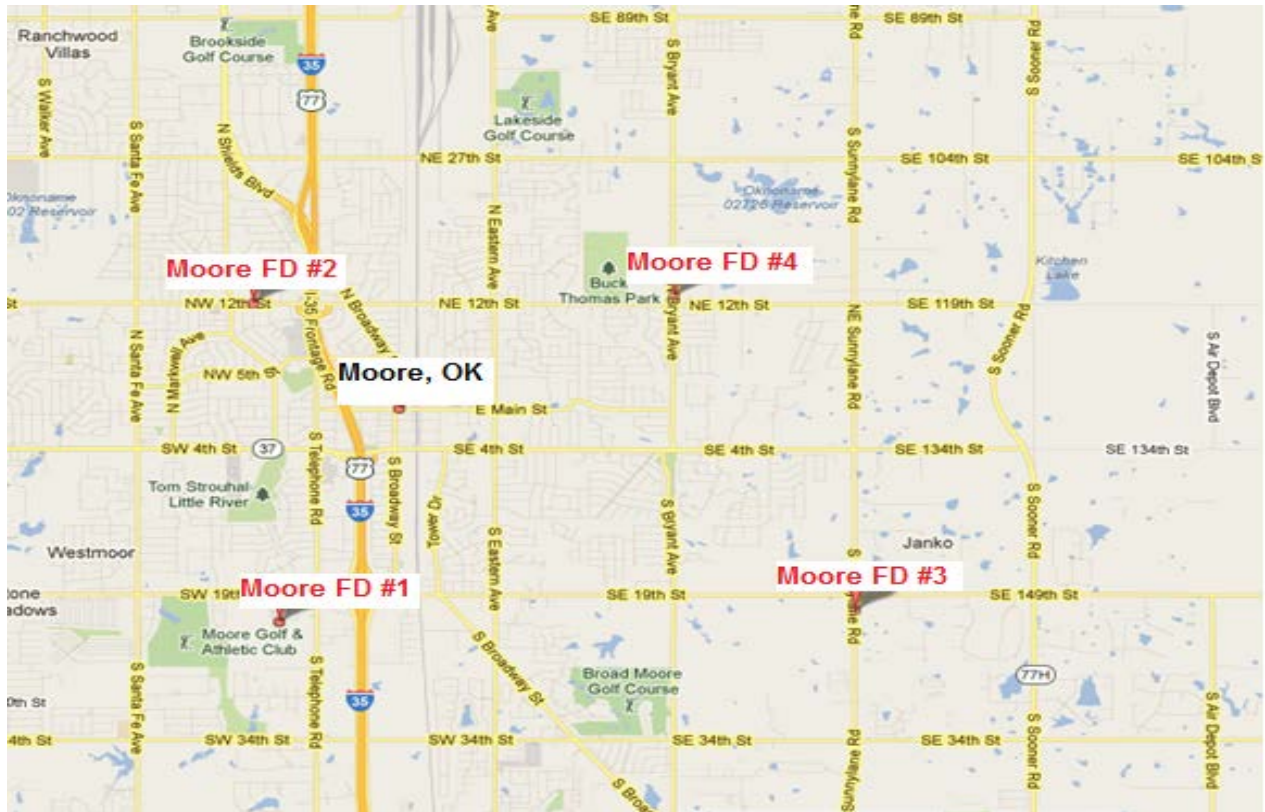
The City of Moore experiences grass fires monthly. Most are small and inconsequential with little or no property damage. During extremely dry periods, Cleveland County and Moore will likely be rated at 600-800 on the KBDI.

Wildfires are usually signaled by dense smoke that fills the area for miles around. Wildfires often begin unnoticed and spread quickly, igniting brush, trees, and homes. Some of the more severe years for Wildland fires with acres loss and damage costs also coincide with drought years of 1998, 2005 and 2006, and 2011.



**Table 3-21 City of Moore Wildfire Events**  
2005-2011 (only data available) No report for 2010

Fire Dept.	Number of Events						Approx. # Acres Lost					
	2005	2006	2007	2008	2009	2011	2005	2006	2007	2008	2009	2011
<b>Moore FD</b>	76	78	30	83	54	12	34	10,121	20	50	24	612



Fire Department locations in Moore:

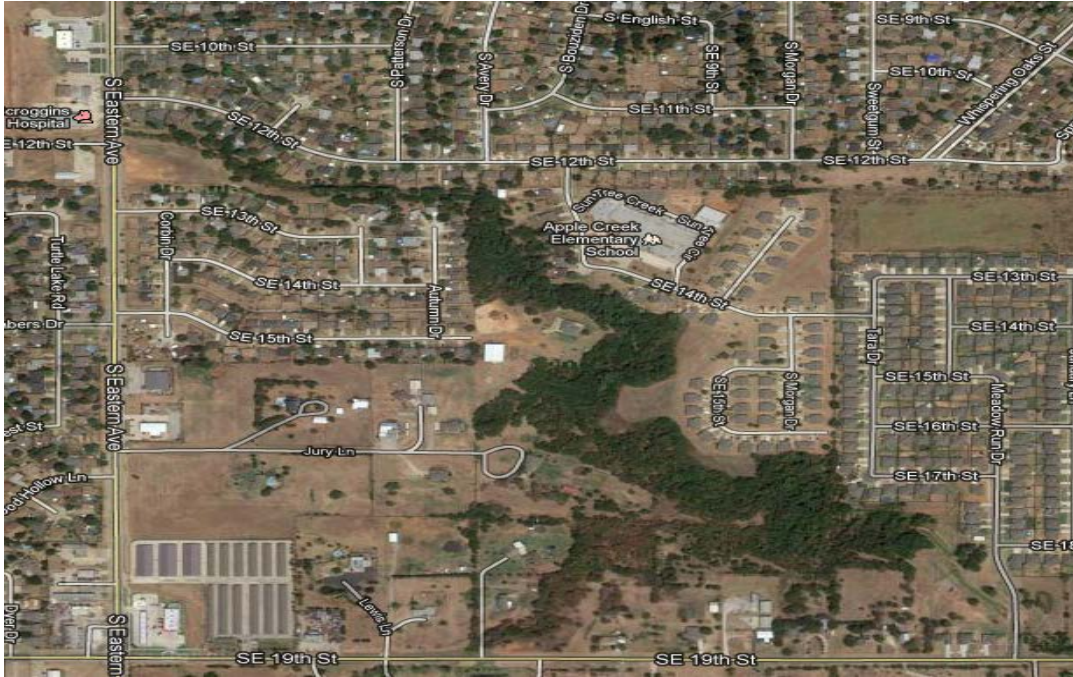
There are a few areas within the City of Moore that have a higher threat of wild fire, the major portion of Moore has a relatively low threat of wildfire.



One of the areas susceptible to the threat and effects of wildfire is the area around Apple Creek Elementary School, although close to a potential wildfire area, the school is at a distance

sufficient for protection of the school buildings, staff and students except for possible smoke from the fire area. The smoke factor for students or staff suffering from respiratory problems would be the major victims of such an event.

Aerial view of the Apple Creek Elementary School building and neighborhood



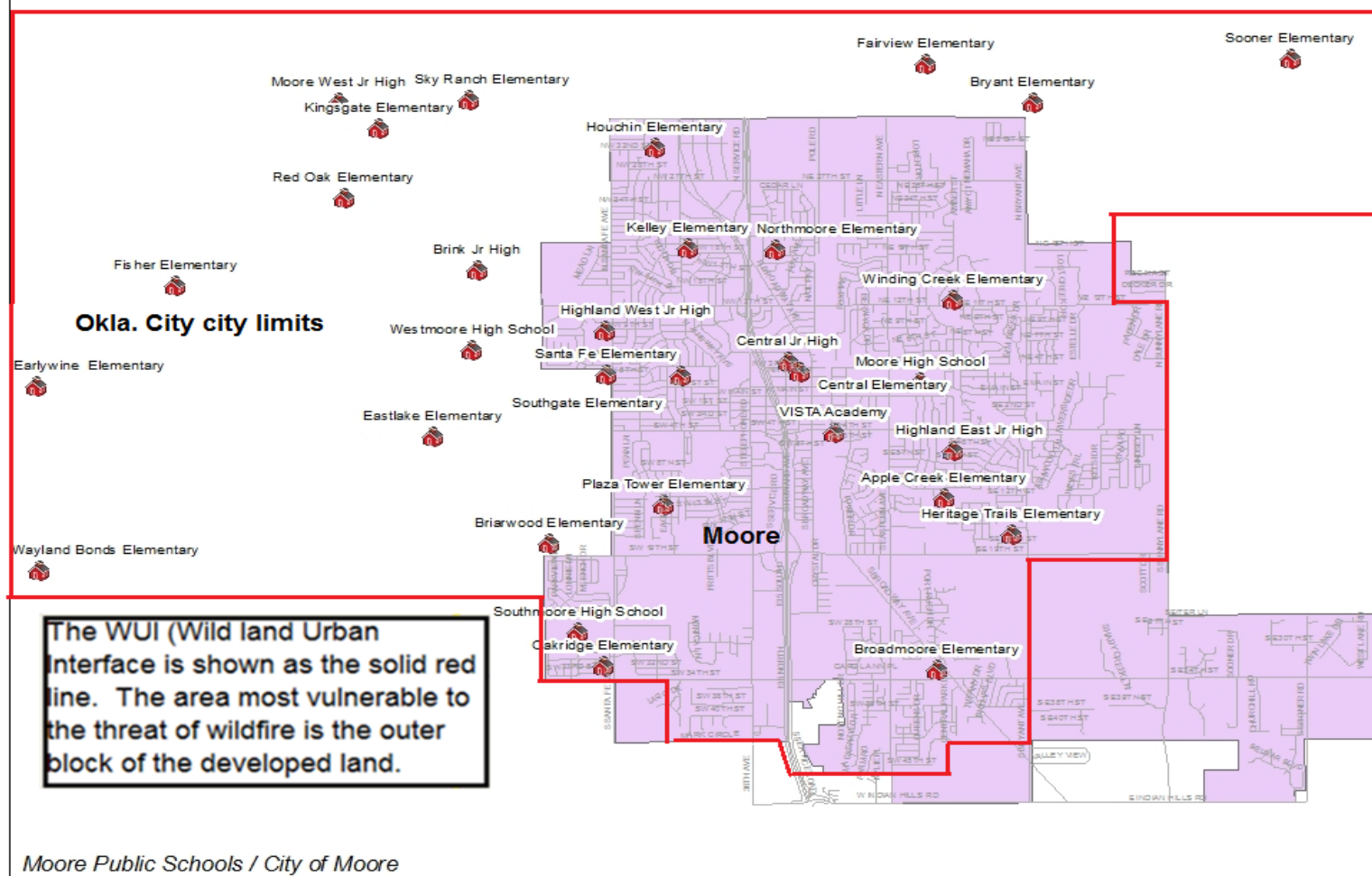
As can be seen from the aerial photo above, there is more of a threat to twenty homes on both sides of the threat area that are more at risk than the school.



A few other areas exist in Moore such as this area in northeast Moore that follows a creek and could be a threat to homes in the area.

### WILDLAND URBAN INTERFACE

The term wildland-urban interface (WUI) has been used for more than two decades to suggest an area where structures (usually homes) are in or near wildlands (forests or rangelands). There is no standard WUI definition. However, the definition listed in a 2001 Federal Register notice is commonly referenced the urban-wildland interface community exists where humans and their development meet or intermix with wildland fuel.



Map provided by the City of Moore Emergency Management

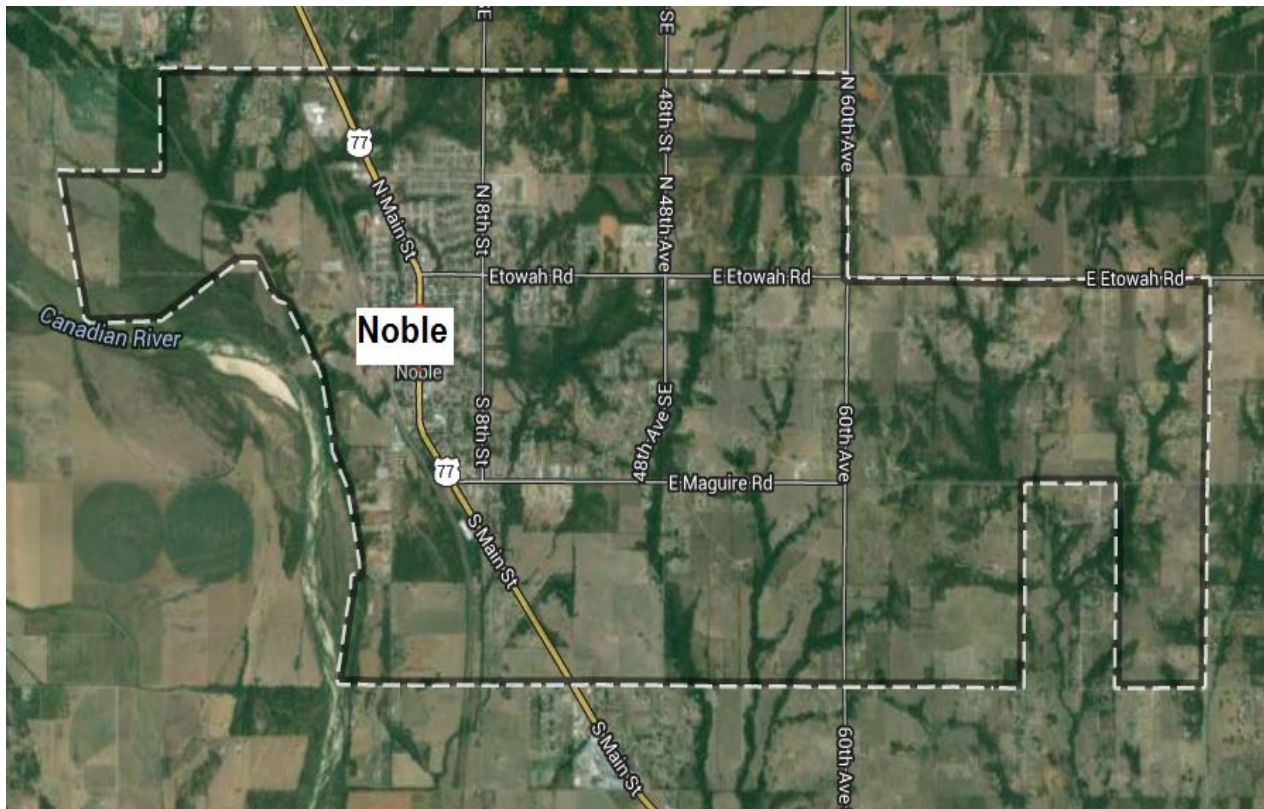
## Probability of Future Events

The City of Moore has a paid Fire Department. Although the wildfire threat is minimal within the city limits, the primary threat is grassfires which are quickly extinguished. The probability of wildfire in the City of Moore including Apple Valley Elementary School is “**Possible**”. The other schools in Moore are not at risk of wildfire.

## City of Noble

### Location

Noble has a threat of grassfire and wildfire though-out much of the community. Even the heavily populated part of Noble is susceptible to wildfire to some extent although the largest threat is in the rural area that has been annexed into the city limits. A lot of areas within Noble proper have been allowed to grow up in brush and trees especially along the many small creek banks throughout Noble. Noble also has a large rural area within its city limits which adds to the threat.



There are a few areas of particular concern for wildfire within the populated area of Noble. One of the most vulnerable is the Dove Canyon Mobile Home Park. The pictures following show the vulnerability of the park for wildfire. It should be noted it is also vulnerable for flooding.





**Some areas of the Dove Canyon Mobile Home Park are susceptible to fire.**

This mobile home park on East Maquire Road has approximately 25 mobile homes and is very close to a potential fire area.

The City of Noble experiences grass and wildland fires. Most are small and inconsequential with little or no property damage although in 2011 they lost approximately 314 acres to fire.

**Table 3-21**

**No report for 2010**

City of Noble Wildfire Events 2005-2011 (only data available)												
Fire Dept.	Number of Events						Approx. # Acres Lost					
	2005	2006	2007	2008	2009	2011	2005	2006	2007	2008	2009	2011
Noble FD	10	12	6	9	5	6	4	NR	80	24	12	314



During extremely dry periods, Cleveland County may be rated at 600-800 on the KBDI. Wildfires are usually signaled by dense smoke that fills the area for miles around. Wildfires often begin unnoticed and spread quickly, igniting brush, trees, and homes. Some of the more severe years for wildland fires with acres loss and damage costs also coincide with drought years of 2005 and 2006, and 2011-12.

In 2011, as shown previously, Noble had a more active fire season than in the previous five reporting periods. They only had six grass/wildfire incidents but lost approximately 314 acres with a \$100,000 property loss. In the monthly reports to the State Fire Marshalls Office out of the six events listed, only two were classified as forest/wildland fires.

Even though the City of Noble has a major wildfire threat the fires they have experienced over the past six years have been contained and did not result in massive fires. This is likely due to dedicated firefighters in Noble and the surrounding communities.

## Probability of Future Events

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Noble does have a major wildfire threat within the community. Most of Oklahoma has a wildfire

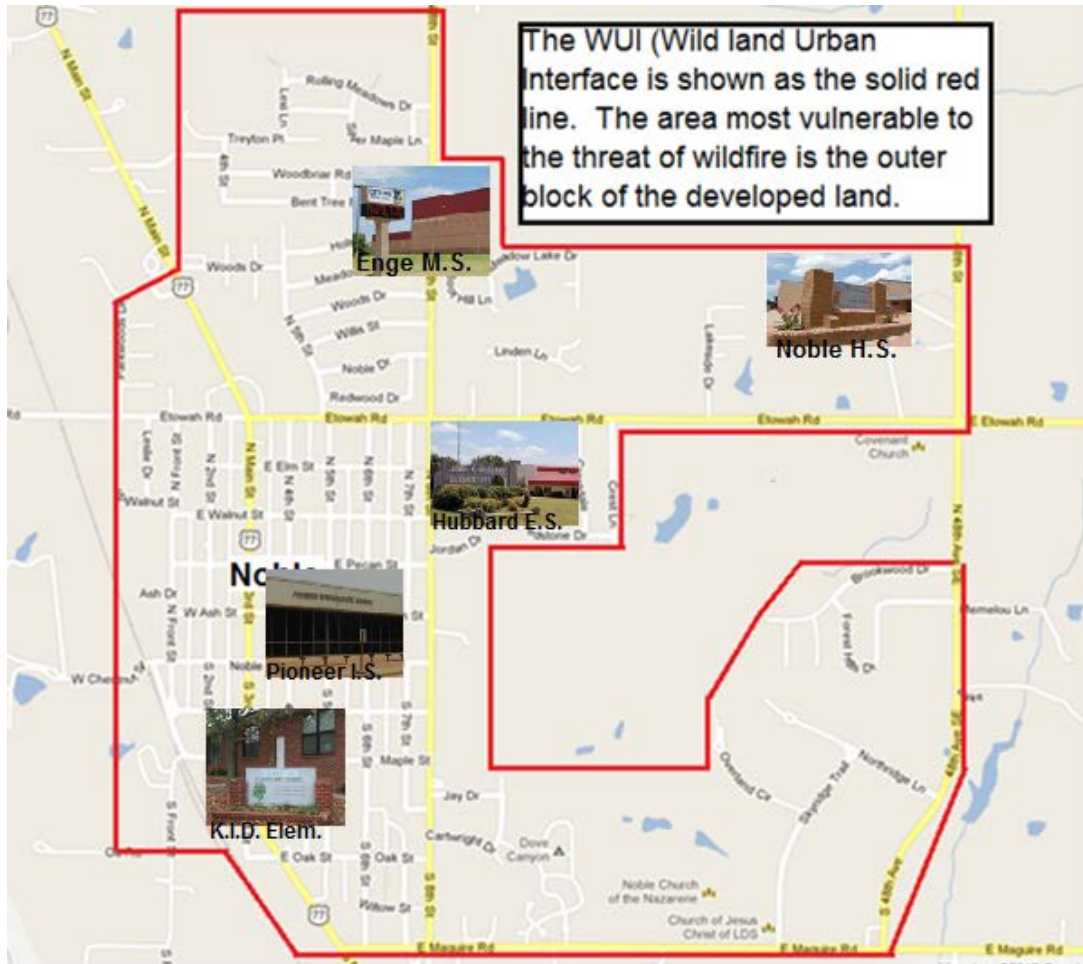


threat due to the climate, the types of fuels present and the cultural practices used. According to the Noble Fire Department, there are abundant fuels within the community. Cleveland County is south of the Snow Belt, leaving its grassy fuels exposed and vulnerable to fire in the dormant season. It is

far enough north of the Gulf of Mexico that it is influenced by the continental climate in the winter. Summers are hot and usually dry, with daytime highs in the mid-90s and generally less than 4 inches of rain in July and August. Oklahoma recognizes 10 months as fire season. Wildland fuels are prone to burning from July through April. Only May and June are not considered “fire season”.

### **WILDLAND URBAN INTERFACE:**

*The term wildland-urban interface (WUI) has been used for more than two decades to suggest an area where structures (usually homes) are in or near wildlands (forests or rangelands). There is no standard WUI definition. However, the definition listed in a 2001 Federal Register notice is commonly referenced the urban-wildland interface community exists where humans and their development meet or intermix with wildland fuel.*



**Noble Public Schools are located within the urban area of the above map and are not considered at threat of wildfire.**



This aerial view of Noble High School shows that the area around the school buildings is well cleared. The aerial view again shows the clearings and roadways that would lessen the potential for wildfire to affect the school buildings negatively. The High School staff has fire procedures in place in case a wildfire event occurs near the school.

## Noble High School



The Wildfire potential within the City of Noble including the High School is **“Possible”**. The other schools in Noble are not at threat.

## City of Norman

### Location

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Norman experiences grassfires and wild land fires in the eastern half of the city limits which is generally rural. Norman also assists the neighboring communities on request to help with large fires in that community’s jurisdiction. The primary threat for wildfire is in the rural area of the City of Norman. Both the University of Oklahoma and Norman Public Schools keep the grass on their campuses cut short so the threat of wildfire or grassfire on their campus is very low.

The City of Norman experiences grass fires regularly. Most are small and inconsequential with little or no property damage. Of the forty-six brush type fire events in 2011, Norman lists nine as forest / wildland fire. The worst wildfire season in recent history was during the 2005-2006 winter and spring months. During those extremely dry periods, Cleveland County was rated at 600-800 on the KBDI.

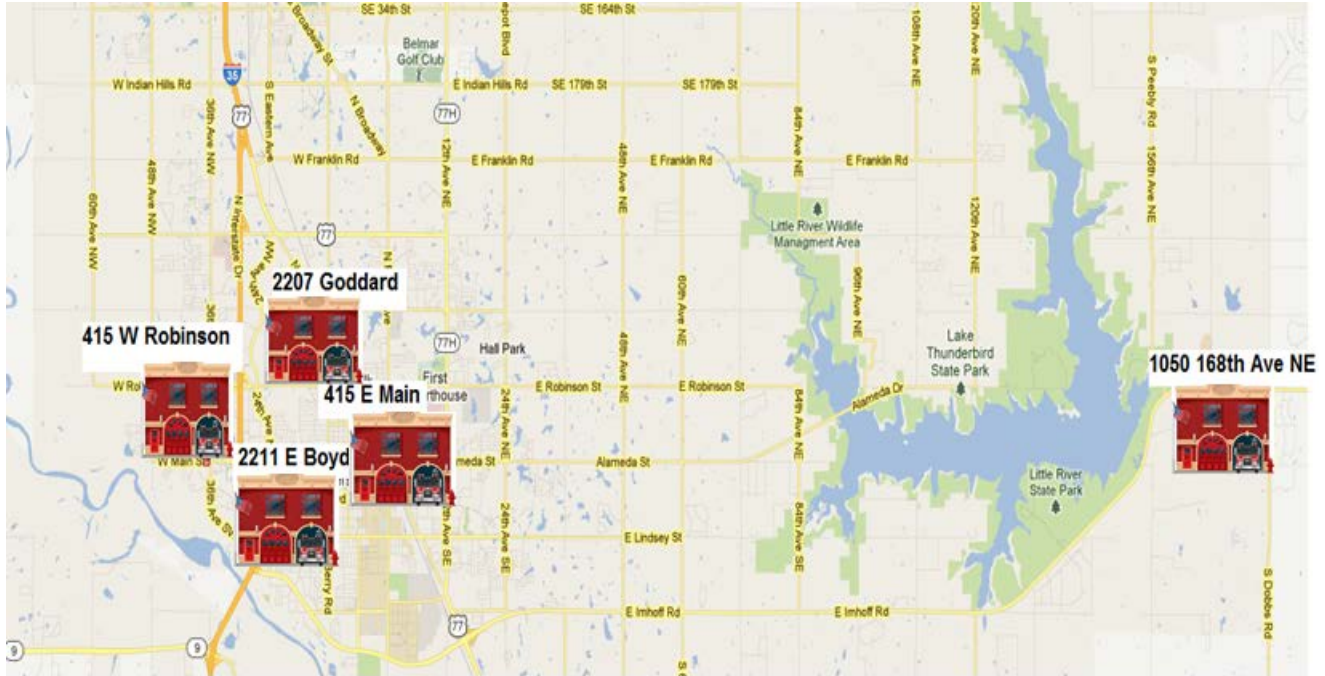
Wildfires are usually indicated by dense smoke that fills the area for miles around. Wildfires often begin unnoticed and spread quickly, igniting brush, trees, and homes. Some of the more severe years for wild land fires with acres loss and damage costs also coincide with drought years of 2005 and 2006, and 2011.

Table 3-21

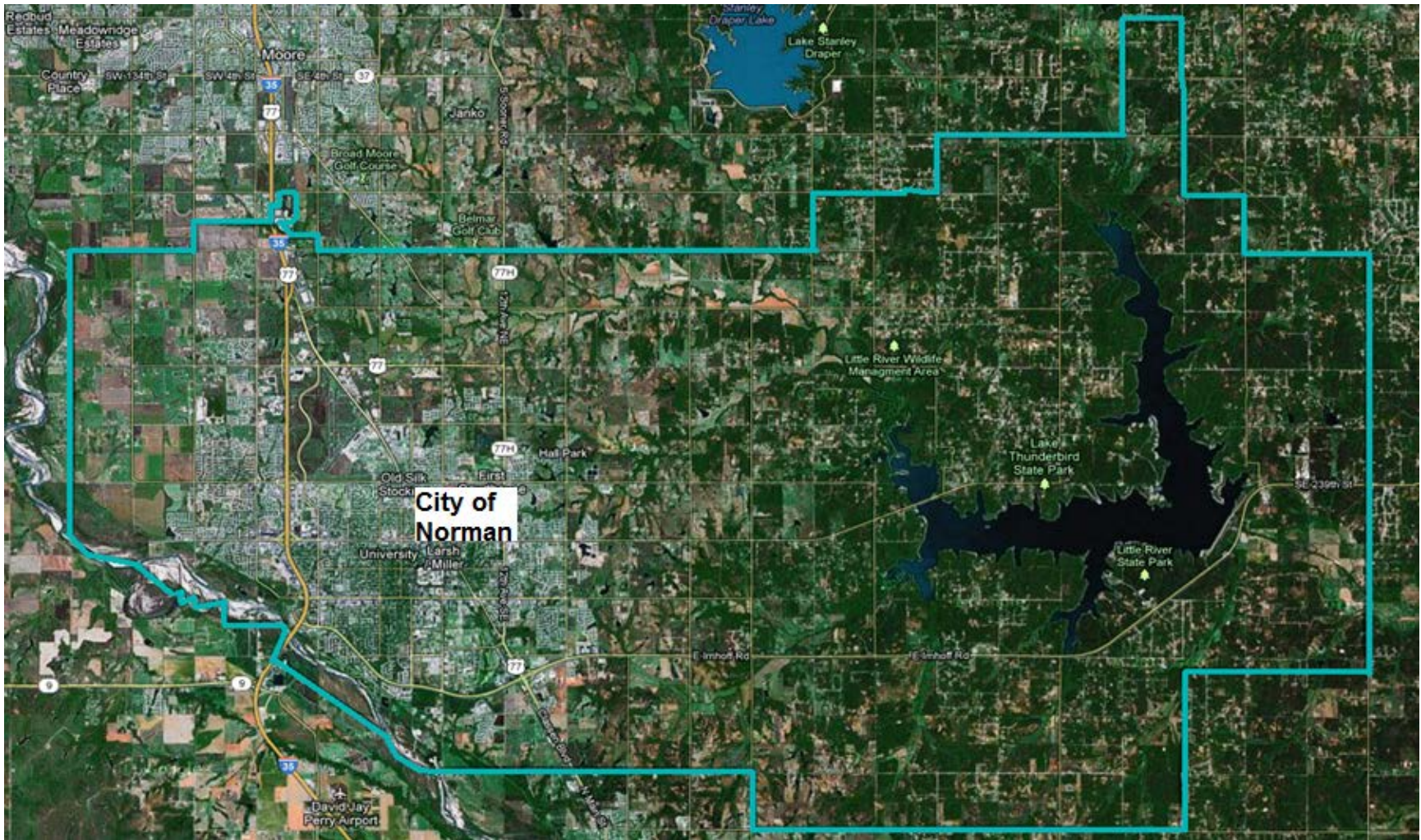
No report for 2010

City of Norman Wildfire Events 2005-2011 (only data available)												
Fire Dept.	Number of Events						Approx. # Acres Lost					
	2005	2006	2007	2008	2009	2011	2005	2006	2007	2008	2009	2011
Norman FD	155	187	99	178	110	46	427	1,073	632	82	66	406

Fire Department locations in Norman:

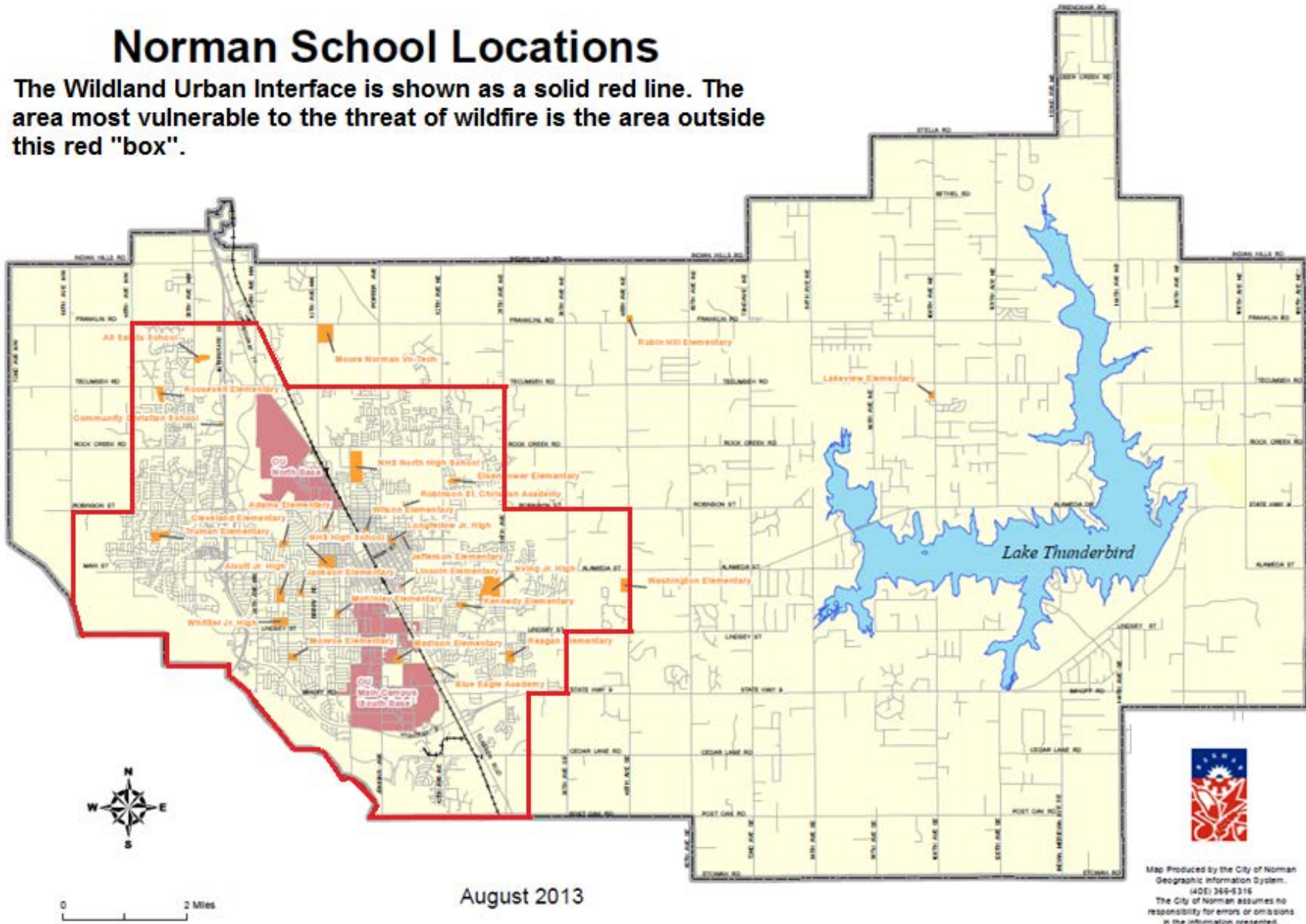


The City of Norman has a relatively low threat of wildfire within the major population although they do experience grassfires. The primary threat for wildfire is in the eastern rural area of the city limits.



# Norman School Locations

The Wildland Urban Interface is shown as a solid red line. The area most vulnerable to the threat of wildfire is the area outside this red "box".



August 2013

Map Produced by the City of Norman  
Geographic Information System.  
(405) 366-6316  
The City of Norman assumes no  
responsibility for errors or omissions  
in the information presented.

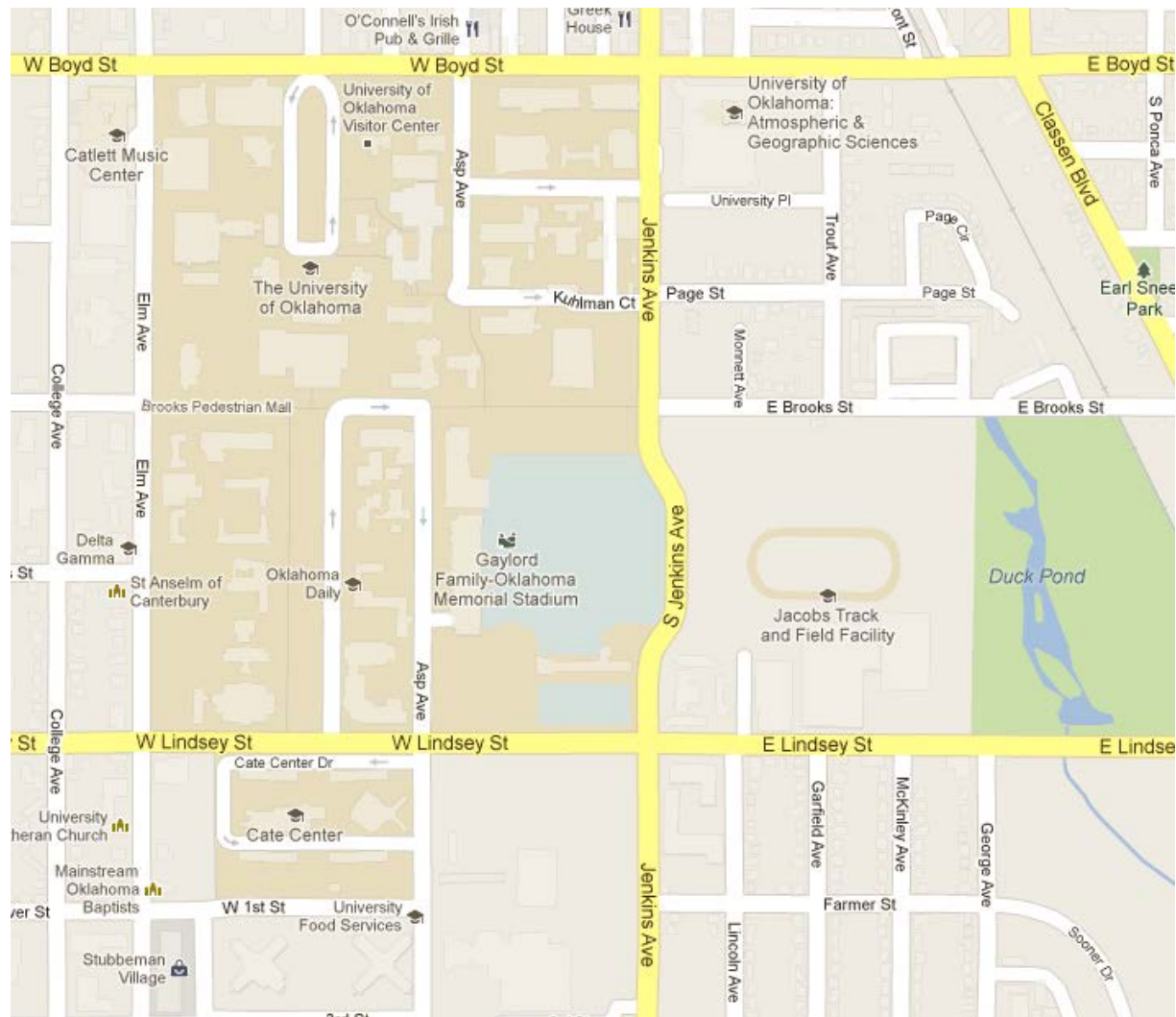


## WILDLAND URBAN INTERFACE:

The term *wildland-urban interface (WUI)* has been used for more than two decades to suggest an area where structures (usually homes) are in or near wildlands (forests or rangelands). There is no standard WUI definition. However, the definition listed in a 2001 Federal Register notice is commonly referenced: the urban-wildland interface community exists where humans and their development meet or intermix with wildland fuel.

The University of Oklahoma is located within the WUI populated area of Norman and is not anticipated to be at threat of wildfire. Grassfires are unlikely, campus grass is kept short and the possibility of property damage from a grassfire is also unlikely.

### University of Oklahoma campus map





Southern OU Central campus area



Central Oklahoma University campus  
Northern Oklahoma University campus



The area in eastern Norman is rural and heavily wooded primarily with blackjack oak trees and high grass. Some areas have substantial growths of red cedar trees which are extremely



flammable and when overrun by fire they explode sending embers and flames into the air enlarging the area threatened and create a threat to any fire fighters nearby. The area is embedded with numerous businesses, homes, mini ranches, ranches and acreages. There are frame structures, brick structures and even mobile homes. Some are located within easy reach of the roads; however, an untold number are “veiled” in the trees along dirt trail roads. The trees and tall grass are thick and often dry throughout the area.

**Northeast Norman Wildfire Potential:**



Small businesses located throughout the area are susceptible to wildfire and in many cases



may be more vulnerable to being destroyed by fire due to their structure or the fact there is not someone at the facility all the time. Businesses are generally more vulnerable at night.

Norman school bus drivers must be vigilant and use their discretion often when confronted with a wildfire situation. Their first concern is the safety of the students. If students would normally disembark at a location involved in a fire, should they let them off or keep them on the bus and return to the school with them. It is a serious situation especially for elementary age students and requires a considerable amount of anxiety for



drivers and students alike. Smoke can also be a concern to not only bus drivers but to any vehicle driver since it is unsafe to continue on a road with heavy smoke. The driver would be unable to see any other vehicle also in the road, often a fire unit. The probability of wildfire affecting a school facility (building) is “Unlikely”

The Moore Norman Technology Center is located on West Franklin Road between Moore and Norman. Although it is located in the rural area, it is not considered in an area prone to wildfire. There are trees and grass on the campus but they are well kept and are not considered at threat of a wildfire.





During the winter months and often during the summer especially during drought periods, vegetation is dry and combustible. The potential for wild land fires in the eastern city limits of Norman is “**Likely**.” The probability of wildfire for the rest of the City of Norman including the public schools, Moore/Norman Technology Center and Oklahoma University is “**Unlikely**”

## Town of Slaughterville

### Location

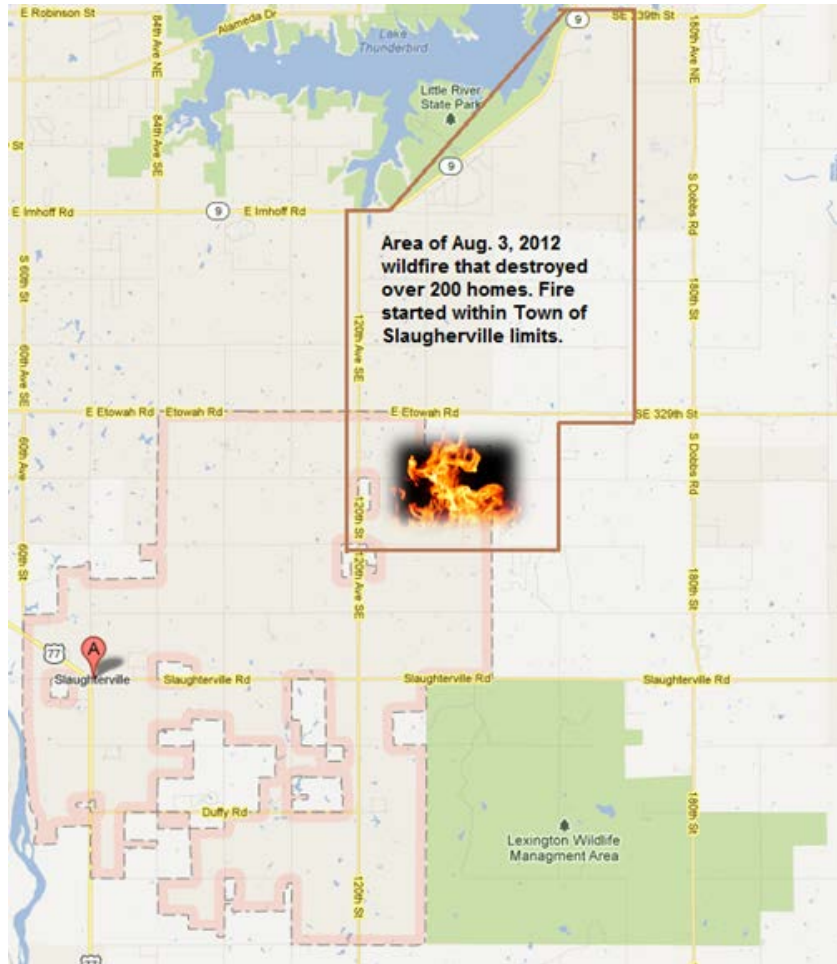
Slaughterville has a threat of wildfire as well as grassfires and often assists in wild land fires surrounding their community. Most of the area around Slaughterville proper is agricultural or small housing acreages.

Wildfires are usually signaled by dense smoke that fills the area for miles around. Wildfires often begin unnoticed and spread quickly, igniting brush, trees, and homes. Some of the more severe years for wild land fires with acres loss and damage costs also coincide with drought years of 2005 and 2006, and 2011.


**Table 3-21**

<b>Town of Slaughterville Wildfire Events 2005-2011 (National Fire Incident Reporting System)</b>												
<b>Fire Dept.</b>	<b>Number of Events</b>						<b>Approx. # Acres Lost</b>					
	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2011</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2011</b>
<b>Slaughterville</b>	50	71	15	53	47	107	175	144	10	118	511	297

As shown above, Slaughterville had 107 grass/wild land events in 2011 with almost 300 acres lost with a \$37,000 monetary loss. Of those 107 events there were three fires identified in reports as a forest/wildfire. The others were listed as grass fire or brush and brush/grass fires. In 2012, a number of structures were lost during a wildfire that started in Slaughterville on August 3.



**Location of August 3, 2012 wildfire**

Starting near the outskirts of Slaughter at 120<sup>th</sup> and Cemetery Road, the wildfire spread to the north-northeast (  ) rapidly. The jurisdictions affected were Norman, unincorporated Cleveland County, and of course, Slaughter. There were over 200 homes destroyed, several more damaged, one fire related death and numerous vehicles destroyed. An FMAG (Fire Management Assistant Grant) was requested by the local fire department and approved by the state. A Presidential Declaration for Individual Assistance was also approved. The fire burned through twenty-one sections bounded by 120<sup>th</sup> on the west and 156<sup>th</sup> on the east and Cemetery Road on the south and Robinson Street (State Highway 9) on the north.



## Probability of Future Events

Citizens are moving farther into “natural” areas to take advantage of the privacy, natural beauty, recreational opportunities and affordable living. Developers are building neighborhoods to accommodate the influx. As a result, fire departments are fighting fires along the Wildland Urban Interface defined as areas where homes are built near or among lands prone to wildland fire. In this part of Oklahoma fire departments refer to wildland fires as grass fires, brush fires or wildfire, they are all part of the WUI and all pose the same threat to local assets. The wildfire threat has increased because of continued development and exposure. Slaughterville has a significant wildfire hazard due to the climate, the types of fuels present and the cultural practices used. Cleveland County is south of the Snow Belt, leaving its grassy fuels exposed and vulnerable to fire in the dormant season. It is far enough north of the Gulf of Mexico that it is influenced by the continental climate in the winter.



Summers are hot and usually dry, with daytime highs in the mid-90s and generally less than four inches of rain in July and August. Oklahoma recognizes 10 months as fire season. Wildland fuels are prone to burning from July through April. Only May and June are not considered “fire season.”

In spite of all the favorable conditions, the Town of Slaughterville has a significant threat of wildfire but a higher threat of brush and grassfires. They do have grass fires on a fairly regular basis; however, it is unusual to have an actual “wildfire” as they did on August 3, 2012. The potential for wild land fires in Slaughterville in the future is “**Likely**”





This area at Bryant and Highway 77 is typical of the terrain in central and western Slaughterville. The sparse population is located in an area with sparsely spaced groves of trees and crops or pasture land. Housing additions are generally acreages or small ranches/farms. In eastern and northern Slaughterville the terrain becomes more heavily wooded and hillier.

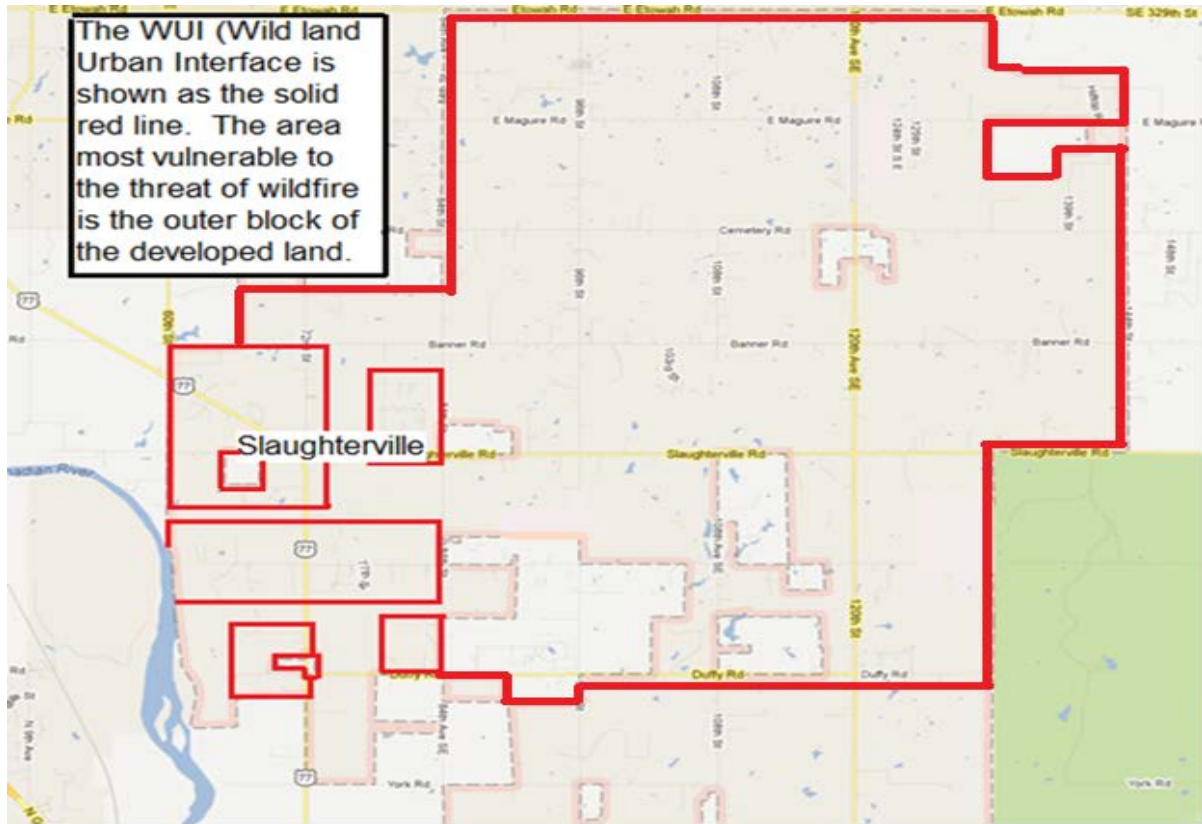
There are no schools in Slaughterville. Slaughterville town limits are broken up and their population is dispersed throughout the town. The areas outlined above are the WUI for Slaughterville indicating the primary populated acreage areas of the town.

The Lexington Wildlife Management area borders the southeastern perimeter of Slaughterville town limits. (Green on the above map.)

### **WILDLAND URBAN INTERFACE:**

**(NOTE: THE FOLLOWING DEFINITION WAS PROVIDED BY THE SLAUGHTERVILLE FIRE CHIEF AS IT RELATES TO THEIR COMMUNITY)**

*The WUI is not a place, pre se, but a set of conditions that can exist in nearly every community. It can be a major subdivision or it can be four homes on an open range. According the National Fire Protection Association, conditions include (but are not limited to): amount, type, and distribution of vegetation; the flammability of the structures (homes, businesses, outbuildings, decks, fences) in the area and their proximity to fire prone vegetation and to other combustible structures; weather patterns and general climate conditions; topography; hydrology; average lot size and road construction.”*



## Probability of Future Events – Cleveland County

As presented earlier in this plan, the State of Oklahoma and Cleveland County have a significant wildfire hazard due to the climate, the types of fuels present and the cultural practices used. Cleveland County is south of the Snow Belt, leaving its grassy fuels exposed and vulnerable to fire in the dormant season. It is far enough north of the Gulf of Mexico that it is influenced by the continental climate in the winter.

Summers are hot and usually dry, with daytime highs in the mid-90s and generally less than four inches of rain in July and August. Oklahoma recognizes 10 months as fire season. Wild land fuels are prone to burning from July through April. Only May and June are not considered “fire season”.



Most at risk are those people who make their homes in woodland settings in rural areas. Cleveland County has many homes and businesses located in wooded or heavy grass areas. Little Axe schools have a moderate threat, although trees have been cleared back from the buildings. Adding to the natural problem is an abundance of cedar trees which, along with the natural winds, cause fires to spread quickly. Based on past experience and that Cleveland County often experiences dry conditions during various times of the year. A large portion of Cleveland County is susceptible to wildfires. The potential for wild land fires is “**Likely.**”

## **Vulnerability and Impact**

Some critical facilities including some fire stations, many transportation routes, pipelines, electrical transmission lines, communications towers, and county district highway equipment yards are located in wooded and/or grassland environments. Loss of any of these facilities could result in a critical drain on the resources, response and recovery capabilities of Cleveland County. See Appendix C – Critical Facilities for more information on vulnerability and impacts of critical facilities at risk from a wildfire. Residences and businesses located in the wooded and high grass areas could be damaged or destroyed causing residents to be evacuated and



possibly relocated. Businesses damaged or lost due to wildfires would be forced to close until repairs could be made or the building rebuilt. This situation could result in loss of employees and loss of income for both employees and owners.

At times, smoke from wildfires may affect patients in healthcare facilities and nursing homes or those who suffer from asthma, emphysema or other respiratory ailments and may be forced to evacuate if the smoke becomes extreme. Loss of transportation routes in Cleveland County could severely affect mail delivery, school bus access, local, state and interstate commerce (Interstate 35) and tourism could be catastrophic to Cleveland County’s economy. Wildlife and livestock along with crops could suffer losses since many of the ranches and farms in the county are located in rural wooded and grassy areas. Loss especially of livestock and crops could deal another blow to Cleveland County’s economy.

## **Conclusion**

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Cleveland County is susceptible to wildfires, and has experienced a number of wild land fires over the past decades with the loss of a number of structures. Due to the dedicated firefighters in Cleveland County and surrounding counties, monetary losses were kept low. Fortunately, Cleveland County is in the Oklahoma City metropolitan area, with a number of large, well-equipped fire departments that are willing to help when large fires occur. Public education regarding fire safety and prevention can help tremendously to relieve wildfires in Cleveland County.

## **References**

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**Cleveland County Emergency Management  
Oklahoma Forestry Department**

## HAZARD PROFILE

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### Winter Storms – Cleveland County

A winter storm can range from moderate snow over a few hours to blizzard conditions with high winds, freezing rain or sleet, and extremely cold temperatures that last several days.

**FLURRIES** are snow events with light snow falling for short durations. No accumulation or only a light dusting is all that is expected with little or no effect on the population of the state.

**SEVERE WINTER STORM** is one that drops four or more inches of snow during a 12-hour period, or six or more inches during a 24-hour span.

**WINTER STORM** This term refers to a combination of winter precipitation, including snow, sleet, freezing rain, etc.

**BLOWING SNOW** is wind-driven snow that reduces visibility and causes significant drifting. Blowing snow may be snow that is falling and/or loose snow on the ground and picked up by the wind.

**BLIZZARDS**, though infrequent in Oklahoma are due to winds over 35 mph with snow and blowing snow reducing visibility to near zero.

**ICE STORMS** occur when freezing rain or sleet falls and freezes immediately on impact.

**FREEZING RAIN** is rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Even small accumulations of ice can cause a significant hazard.



**SLEET** is rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects. However, it can accumulate like snow and cause a hazard to motorists.

**WIND CHILL** is used to describe the relative discomfort and danger to people from the combination of cold temperatures and wind. The wind chill chart below from the National Weather Service shows the wind chill derived from both wind speed and temperature.

### Location

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All of Cleveland County, including the unincorporated communities and the incorporated communities, all public school districts, the University of Oklahoma and Moore/Norman Technology Center are susceptible to the potential of winter snow and ice storms. These events

are extremely paralyzing to communities and the citizens affected. Since Cleveland County has many citizens living in the rural areas but working in the urban areas in and near Cleveland County, these events are particularly paralyzing for the residents.

## Extent

Heavy snow can immobilize and paralyze an urban area, stranding commuters, stopping the flow of supplies, and disrupting emergency services. Accumulations of snow can collapse building roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, repairing damages, and loss of business can have large economic impacts on cities and towns. The record low temperature in Cleveland County was -17 degrees in Norman, February 13, 1899. The greatest seasonal snowfall was 22.1 inches (1947-1948) with the greatest daily snowfall of 11.0 inches in Norman, on February 18, 1921.

Snow and Sleet (inches)										
	AVERAGE	EXTREMES (1952-2003)				AVG # DAYS PER MONTH (1971-2000)				
	1971-2000	Monthly Max	Daily Max	Greatest Depth		any	meas	0.50"+	1.00"+	Pot. Glazing
Jan	2.7"	19.0" (1988)	13.0" (7th, 1988)	7.0" (9th, 1965)	2	1	1	1	3	
Feb	1.1"	10.0" (1968)	6.0" (21st, 1966)	8.0" (17th, 1978)	1	1	1	*	1	
Mar	0.6"	11.0" (1968)	8.8" (12th, 1958)	6.0" (12th, 1958)	1	*	*	*	*	
Apr	0.1"	2.0" (1973)	2.0" (8th, 1973)	0.1" (12th, 1957)	*	*	*	*		
May		0.0" (1954)	0.0" (1st, 1954)							
Jun		0.0" (1954)	0.0" (15th, 1954)	1.0" (4th, 1989)						
Jul										
Aug										
Sep										
Oct	0.0"	0.2" (1993)	0.2" (30th, 1993)	0.1" (30th, 1993)	*	*			*	
Nov	0.6"	6.0" (2001)	4.5" (18th, 1972)	6.0" (29th, 2001)	1	*	*	*	*	
Dec	1.0"	11.5" (1954)	5.5" (28th, 1954)	6.0" (30th, 1969)	2	1	1	*	1	
Annual	6.1"	19.0" (Jan 1988)	13.0" (Jan 7, 1988)	8.0" (Feb 17, 1978)	8	4	3	2	6	

Cleveland County is affected periodically by heavy snow and ice that cause damage in the county. Snow and ice sometimes plague the county causing road closures and limited travel. Cleveland County annual average snowfall is 6.1 inches.

Wind chills play a big part in Cleveland County severe winter weather since the welfare of the public is directly related to wind chill. The Wind Chill Index was created in 1870. On November 1, 2001, the National Weather Service released a more scientifically accurate equation.

Wind Chill is the combination of wind and temperature that serves as an estimate of how cold it

## National Weather Service Wind Chill Chart

Table 3-22

		New Wind Chill Chart													
		Equivalent Temperature °F)													
Wind Speed (mph)	calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25
	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65

"Calm-air" as used in wind chill determinations actually refers to the conditions created by a person walking briskly (at 4 miles-per-hour) under calm wind conditions.

actually feels to exposed human skin. Cleveland County considers wind chill values below -5 degrees with 5 mph wind speeds to be extremely dangerous to the population although hypothermia can occur at higher temperatures and cause deaths.

The National Weather Service issues this product when the wind chill could be life threatening if action is not taken. The criterion for this warning varies from state to state. The Tulsa Weather Service issues a "wind chill advisory when the wind chill values of -5° F to -19° F...coupled with wind speeds of 10 mph or greater are expected to occur for more than two hours." The average wind speed in Cleveland County is ten miles per hour.

Moderate to heavy snow can immobilize vehicle traffic in urban areas and paralyze communities, strand commuters, stop the flow of supplies, and disrupt emergency services.

## The Sperry-Piltz Utility Ice Damage Index

**Table 3-23**

Ice Index	Radial Ice Amount (inches)	Wind (mph)	Damage and Impact Descriptions
1	< 0.25	15-25	Some localized utility interruptions possible, typically lasting only 1 or 2 hours maximum.
	0.25-0.50	< 15	
2	< 0.25	≥ 25	Scattered utility interruptions expected, typically lasting less than 8-12 hours maximum.
	0.25-0.50	15-25	
	0.50-1.00	< 15	
3	0.25-0.50	≥ 25	Numerous utility interruptions, with some damage to main feeder lines expected with outages lasting from 1-3 days.
	0.50-0.75	15-25	
	0.75-1.00	< 15	
4	0.50-0.75	≥ 25	Prolonged & widespread utility interruptions, with extensive damage to main distribution feeder lines and possibly some high voltage transmission lines. Outages expected to last more than 3 to 5 days.
	0.75-1.00	15-25	
	1.00-1.50	< 15	
5	0.75-1.00	≥ 25	Catastrophic damage to entire utility systems. Outages could last from one week to several weeks in some areas.
	1.00-1.50	15-25	
	> 1.50	< 15	

*The categories are based upon combinations of precipitation totals, temperature and wind speed.*

Accumulations of snow frequently topple trees and power lines and in rare instances, can collapse building roofs or cause other structural damage. The cost of snow removal, repairing damages, and loss of business can have large economic impacts on cities and towns.

Minimum temperatures below 15° with winds exceeding 10 mph bring local concerns in Cleveland County due to potential harm to people and animals. Wind chills of zero degrees and below are considered severe in Cleveland County.

### Previous Occurrences

Cleveland County and the State Oklahoma have been plagued with a series of major winter events during the last decade, 2000-01; 2001-02; 2007; 2009 and again in 2010 and 2011. Ice storms are extended freezing rain events, lasting several hours to days at some locations, with heavy ice accumulations. The icy cover can down power lines and limbs, causing millions of dollars in damage and widespread power outages. Significant icing events occur with nearly the same frequency as heavy snow events. While ice accumulation is normally less than an inch, storms depositing several inches of ice have occurred. The consecutive winters of 2000-01 and 2001-02 each featured a major ice storm that deposited more than three inches of ice in 24 hours across much of Oklahoma. A similar event occurred in January 2007, including Cleveland



County. Due to the number of storms during the last five years, only five years are profiled for this plan.

<b>Table 3-24 CLEVELAND COUNTY WINTER STORM EVENTS</b>			
<b>2006 – APRIL 2011</b>			
Data from NCDC			
<b>DATE</b>	<b>LOCATION</b>	<b>DESCRIPTION</b>	<b>ESTIMATED DAMAGE</b>
04 Feb 2011	County wide	<b>Winter Weather</b> - Broad-scale ascent over a very cold temperature at the surface allowed for very dry snow to fall over southern and eastern Oklahoma. An area of two to four inches extended over a large area, with lighter amounts further north into central Oklahoma.	Unknown
01 Feb 2011	County wide	<b>Winter Weather</b> - One to two inches of snow was measured across the county. Frequent wind gusts over 35 mph created considerable blowing and drifting of the snowfall, which reduced visibilities. Around 3 inches of snow was measured at the Great Salt Plains Dam and one mile south-southeast of Helena. Wind gusts over 40 mph also created considerable blowing and drifting of the snowfall	Unknown
31 Jan 2011	County wide	<b>Winter Storm</b> - Light sleet, freezing rain, and snow began during the late evening, with wind gusts increasing to 35 mph by midnight.	Unknown
11 Feb 2010	County wide	<b>Winter Weather</b> - Snowfall accumulation averaged near an inch around the county, with 1.2 inches measured 2 miles southeast of Norman.	Unknown
29 Jan 2010	County wide	<b>Winter Weather</b> - Snow totals averaged around two inches across the county.	Unknown
29-30 Jan 2010	County wide	<b>Heavy Snow</b> - Snowfall averaged five to six inches around the county, with isolated totals near eight inches.	Unknown
28-29 Jan 2010	County wide	<b>Winter Storm</b> - Up to a half of an inch of glaze accumulated on exposed, elevated surfaces before changing to sleet. An inch to inch and a half of sleet accumulated on top of the glaze.	Unknown
28-29 Jan 2010	County wide	<b>Ice Storm</b> - A quarter to a half of an inch of glaze accumulated on elevated surfaces across the county. The highest glaze accumulations occurred over the southern half of Cleveland county. Farther north, the freezing rain changed over to heavy sleet by midafternoon. A little over an inch of sleet accumulated on top of the glaze.	Unknown
26-27 Jan 2009	County wide	<b>Winter Weather</b> - An inch a half of snow accumulated in and around Woodward county. Some areas also picked up a thin layer of glaze before the snow began. Numerous accidents were reported as a result of the slick streets. No injuries were reported. Monetary damages were not given.	Unknown
26-27 Jan 2009	County wide	<b>Winter Storm</b> - A quarter of an inch of ice glaze accumulated, with an additional three inches of sleet on top of that was reported near Tecumseh. Travel around town was significantly hampered with several minor wrecks reported. Shawnee reported at least a half of an inch of sleet and ice glaze accumulation. Ten minor automobile accidents were reported with a few minor injuries. Monetary damages were not given.	Unknown

**Table 3-24 CLEVELAND COUNTY WINTER STORM EVENTS  
2006 – APRIL 2011**  
Data from NCDC

DATE	LOCATION	DESCRIPTION	ESTIMATED DAMAGE
31 Jan 2008	Moore	<b>Winter Weather</b> - One inch of snow was reported in Moore.	Unknown
26 Dec 2007	County wide	<b>Winter Storm</b> - The area near the Twin Lakes WSR-88D received two inches of snow. Although most locations only reported one to two inches of snow accumulation, a narrow swath of 4 to 6 inches was reported in and around the Seminole area. Travel was obviously slowed in this area, but no accidents were reported.	Unknown
22 Dec 2007	County wide	<b>Winter Weather</b> - A quick burst of heavy snow accompanied the storm system. Due to the quick movement of the system, most locations received one to two inches of snowfall. However, some areas did report upwards of 4 to 6 inches of snowfall. A few automobile accidents occurred as a result of the snowfall, with minor injuries.	\$8,000
12-14 Jan 2007	County wide	<b>Winter Storm</b> - A strong winter storm crippled much of Oklahoma from January 12th through the 14th, spreading snow, freezing rain and sleet across the state. The wintry precipitation caused numerous traffic accidents with numerous indirect injuries and 14 indirect fatalities. Many trees and powers lines were downed with thousands of residents without power.	\$50,000
29-30 Nov 2006	County wide	<b>Winter Weather</b> - Winter precipitation fell in the form of freezing rain, sleet, and snow beginning on November 29 and ended during the evening of November 30.	Unknown
17-19 Feb 2006	County wide	<b>Winter Weather</b> - Freezing rain and sleet caused roadways to become slick and hazardous, especially the bridges and overpasses, Friday evening. Temperatures remaining well below freezing caused the dangerous road conditions to continue throughout the holiday weekend. However, the greatest impact on the area occurred Friday evening. Roads become slick during the tail end of rush hour traffic, with over 1500 calls coming into Oklahoma City 911 during the first few hours. More than twenty injury (indirect) accidents were reported Friday night with numerous other accidents occurring across the city. An accident involving a semi brought traffic to a stand still for more than an hour on Interstate 40 near the Interstate 35 interchange. Local ambulances were working continuously Friday evening.	Unknown

### Probability of Future Events

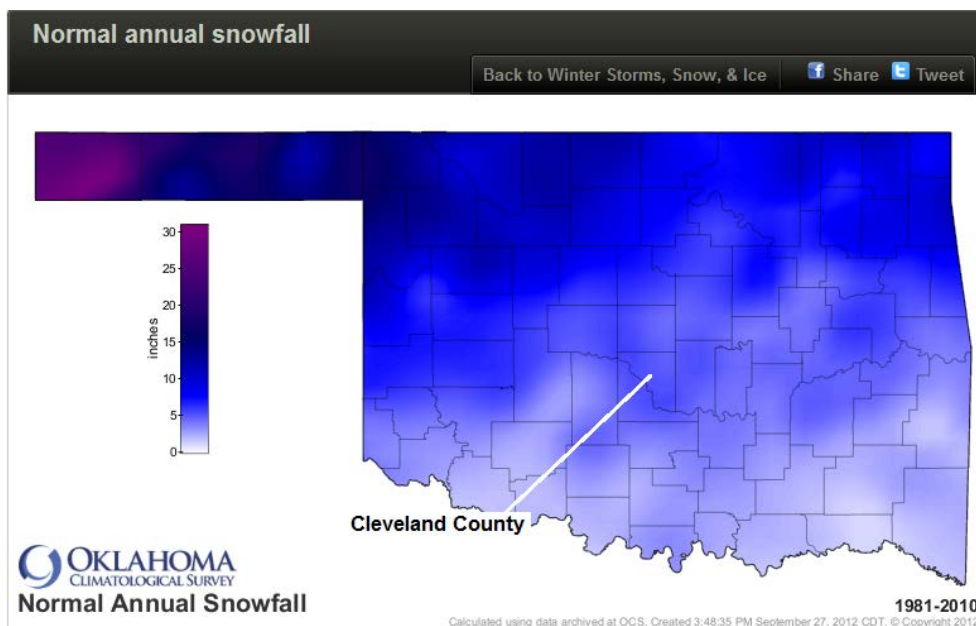
The frequency of snow events is also related to drought periods since during droughts little moisture is experienced whether rain or snow events. Locations in Oklahoma, including Cleveland County, have gone several years between events.

Oklahoma's location between the cold winter temperatures of the Rocky Mountains and the moisture from the Gulf of Mexico gives Oklahoma the potential for further ice and snow events. Northwest Oklahoma receives more snow annually than the Cleveland County area; however, heavy accumulations of ice and/or snow are still possible. In recent years there has been more damage from ice storms than from snowfall.

The following map provided through the Oklahoma Climatological Survey shows that Cleveland County is in an area of the state subject to 0-6 inches of winter precipitation.

### **Cleveland County Winter Climate**

Average Annual Snowfall:	6.8 inches
Days with snow on ground:	5
Greatest Seasonal Snowfall:	22.1 inches (1947-1948)
Greatest Daily Snowfall:	11.0 inches(Norman, February 18, 1921)
Last Freeze in spring:	April 3
First Freeze in autumn:	November 2



Data and map provided by Oklahoma Climatological Survey

*(Map is the latest available)*

Based on recent past history and Cleveland County's location in Oklahoma, the probability of future winter storms is "Likely."

## Vulnerability and Impact

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Residents in Cleveland County have been inundated with a series of major ice and snow storms during the last decade. These events have had an impact upon all of Cleveland County, its jurisdictions (Etowah, Lexington, Moore, Noble and Slaughterville) as well as the public school districts, Moore-Norman Technology Center and the University of Oklahoma. Ice storms typically have lasted several hours to days, sometimes with heavy ice accumulations. The icy cover downs power lines and limbs, causing millions of dollars in damage and widespread power outages. These events, the results of which generally last several days to several weeks, are extremely paralyzing to communities and the citizens affected.



Winter storms are sometimes accompanied by strong winds which create blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chill. Strong winds with these intense storms can knock down trees, utility poles, and power lines. Heavy accumulations of ice also bring down trees, electrical wires, telephone poles and lines, and communication towers. Many electric and telephone lines in Cleveland County are still above

ground including major transmission lines. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Rural and urban area residents (such as Etowah, Lexington, Noble and Slaughterville) may be without power for several weeks before the power companies can get power to them.

In extreme cases especially those involving elderly, handicapped, or very young, it is necessary to move them to shelters where they can stay until they return home. Even though shelters are provided as soon as possible, many may make arrangements with friends or relatives in unaffected areas for temporary lodging and/or care. This is not only inconvenient, but the temporary loss of population along with inaccessible roads for essential services and shopping cause critical shortages to businesses that are able to open. See Appendix C – Critical Facilities for more information on vulnerability and impacts of critical facilities at risk from a winter storm.



Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. Infants and elderly people

are most susceptible. Freezing temperatures can cause severe damage to crops and other critical vegetation. Pipes may freeze and burst in homes or businesses that are poorly insulated or without heat. Structure fires occur more frequently in the winter due to lack of proper safety precautions and present a greater danger because water supplies may freeze and impede firefighting efforts. Icy roads may also impede firefighting. People die of hypothermia from prolonged exposure to the cold. Indigent and elderly people are most vulnerable to winter storms and account for the largest percentage of hypothermia victims largely due to improperly vented or unheated homes, but the leading cause of death during winter storms is from automobile or other transportation accidents. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians who are not familiar with how to deal with icy conditions.

In December, 2013, severe winter storms affected much of the State of Oklahoma, including all of Cleveland County, its participating jurisdictions, public school systems as well as the Moore-Norman Technology and the University of Oklahoma. These events created days of school closings, lost work days for businesses and employees as well as creating hazardous travel, which resulted in personal injury, deaths and property damage.

## Conclusions

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Heavy snow and/or ice usually immobilize transportation facilities, stranding commuters,



stopping the flow of supplies, and disrupting emergency services. Accumulations of snow/ice can collapse older, weaker buildings and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost.

The cost of snow removal, repairing damages, and loss of business can have large economic impacts on the cities and towns in Cleveland County.

## References

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(NCDC) National Climatic Data Center (<http://www.ncdc.noaa.gov/stormevents/>)  
(NWS) National Weather Service – Norman <http://www.srh.noaa.gov/oun/>  
(OCS)Oklahoma Climatological Survey (<http://climate.mesonet.org/>)

## **Long Range Growth and Post Disaster Redevelopment**

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Cleveland County is located in the central part of the state, and the population is largely urban. A majority of the county's land use is designated as the cities and towns in the county. The largest city, Norman, is located in central Cleveland County. Land uses within the urban areas of the county consist of industrial, manufacturing, general business and education. The rural areas of the county are primarily ranching, farming and recreational interests.

As shown in the population segment of Chapter One, the communities of Lexington, Moore, Noble, Norman and Slaughterville have shown population increases since the last census in 2000. Only the Etowah community has failed to show growth.

## **Analyzing Development Trends**

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In reviewing past development and growth in Cleveland County, it is likely the growth pattern during the near future will show continued development although slow. The incorporated areas within the county are generally not losing population and the possibility of expanding the town or city limits exists. Schools are also generally growing and as needed plan to add or modify additional buildings to adequately house and provide necessary facility.

The highest area of construction and development is in The City of Moore and Moore Public Schools which are once again involved in major building projects due to the May tornados. While much of the building construction is private businesses and private homes damaged or destroyed in the tornados. The Moore Public School District Superintendent indicated recently that they have about \$100 million in construction going on for the public school buildings including the two schools, Briarwood and Plaza Towers that were destroyed and then demolished and repairs to several other schools that were damaged.



There are additional developments underway in Norman as well as individual single-family structures. The other communities have a slower rate of development progressing than the larger communities. Cleveland County's estimated population between 2010 and 2012 indicates the rate of increase at 3.9% (255,757 to 265,638).

**Etowah housing building permits: (unofficial):** None

**Lexington housing building permits: (unofficial)**

- |   |  |
|---|--|
| <input type="checkbox"/> 2007: 5 buildings, average cost: \$129,000 | <input type="checkbox"/> 2010: 1 building, average cost: \$117,000   |
| <input type="checkbox"/> 2008: 3 buildings, average cost: \$132,000 | <input type="checkbox"/> 2011: 3 buildings, average cost: \$135,900  |
| <input type="checkbox"/> 2009: 4 buildings, average cost: \$110,200 | <input type="checkbox"/> 2012 : 2 buildings, average cost: \$180,400 |

**Moore: housing building permits (unofficial)**

- |   |   |
|---|---|
| <input type="checkbox"/> 2007: 561 buildings, average cost: \$144,500 | <input type="checkbox"/> 2010: 305 buildings, average cost: \$163,800 |
| <input type="checkbox"/> 2008: 348 buildings, average cost: \$158,800 | <input type="checkbox"/> 2011: 252 buildings, average cost: \$172,800 |
| <input type="checkbox"/> 2009: 326 buildings, average cost: \$152,000 | <input type="checkbox"/> 2012: 239 buildings, average cost: \$153,200 |

**Noble : housing building permits (unofficial)**

- |  |  |
|--|--|
| <input type="checkbox"/> 2007: 31 buildings, average cost: \$137,700 | <input type="checkbox"/> 2010: 10 buildings, average cost: \$176,000 |
| <input type="checkbox"/> 2008: 20 buildings, average cost: \$147,100 | <input type="checkbox"/> 2011: 11 buildings, average cost: \$181,000 |
| <input type="checkbox"/> 2009: 19 buildings, average cost: \$127,100 | <input type="checkbox"/> 2012: 12 buildings, average cost: \$179,800 |

**Norman: housing building permits (unofficial)**

- |   |   |
|---|---|
| <input type="checkbox"/> 2007: 419 buildings, average cost: \$172,600 | <input type="checkbox"/> 2010: 336 buildings, average cost: \$177,500 |
| <input type="checkbox"/> 2008: 516 buildings, average cost: \$184,600 | <input type="checkbox"/> 2011: 350 buildings, average cost: \$184,300 |
| <input type="checkbox"/> 2009: 339 buildings, average cost: \$172,200 | <input type="checkbox"/> 2012: 414 buildings, average cost: \$179,500 |

**Slaughterville: housing building permits (unofficial)**

- |  |  |
|--|--|
| <input type="checkbox"/> 2007: 12 buildings, average cost: \$140,400 | <input type="checkbox"/> 2010: 5 buildings, average cost: \$280,200  |
| <input type="checkbox"/> 2008: 10 buildings, average cost: \$95,800  | <input type="checkbox"/> 2011: 7 buildings, average cost: \$174,000  |
| <input type="checkbox"/> 2009: 6 buildings, average cost: \$149,000  | <input type="checkbox"/> 2012: 13 buildings, average cost: \$149,900 |

The availability of sewer, water, electricity, utilities, and roads regulates new residential growth for any area. Private companies provide most of those services to residents and businesses throughout the county. Moore and Norman have their own departments. Lexington, Noble maintains Water and Sewer Departments. Slaughterville utility fees are collected by the community but they do not have their own departments. The future quality and availability of electricity and water is good in the county and no major problems are anticipated.

Post disaster redevelopment caused by an event will follow normal development patterns unless drastic steps have to be taken for the safety of citizens which has been the case in the City of

Moore. The availability of utilities and roads would also be affected in the redevelopment criteria. The City of Moore has done an exceptional job of replacing utilities and roadways following the tornado.

The economic pressures, stability of the area and historical facts have contributed to the conclusions reached in this section. Growth factors evident from the 2000 census listing Cleveland County population as 43,950 versus the 2009 census estimate of 45,211 (2.8% increase) support this position. Expanded emphasis for long range and post disaster redevelopment is unwarranted at this time. However, additional specific information is included here to express the additional contributing information provided by each community:

JURISDICTION	COMMENTS REGARDING CURRENT DEVELOPMENT
<b>Cleveland County</b>	Since the approval of the previous Cleveland County Hazard Mitigation Plan, the county has not altered its priorities or endeavors relating to its vulnerabilities. The county currently has made no changes in policy relating to development in hazard prone areas.
<b>Etowah</b>	The Town of Etowah is a small incorporated community of less than 100 citizens. The Town does not maintain a city hall or other municipal structures and currently has no plans to develop, including development in any of the hazard prone areas.
<b>Lexington</b>	<p>The Lexington City Manager confirms that the City of Lexington has plans for future development for the City wherein the City has considered a variety of development measures to mitigate future damage and improve recovery in the event of disasters. The primary projects include improvements or reconstruction of the waste water treatment facility which serves the community. Because the expense for this one project exceeds \$3 million, they are currently researching funding sources. Because the current facility has been in use since 1975 and must be brought up to current standards, the best option is to secure funding for construction of a new facility.</p> <p>A secondary infrastructure project is the refurbishment of the water tower located on Sixth Street; this tower serves the community from the city's water wells. Improving this facility is an endeavor to prevent damage to homes and businesses as a result of a variety of disaster situations which can cause damage to the water and waste water systems for the city and residents.</p> <p>The fire department is responsible for the southeastern part of Cleveland county from State Highway 39 south to the South Canadian river. The Lexington Fire Department is currently working with the Lexington Rural Fire Association to build a second station at S.E. 144th and State Highway 39 to better serve the rural areas of Southern Cleveland County.</p>



JURISDICTION	COMMENTS REGARDING CURRENT DEVELOPMENT
<p><b>Lexington Public Schools</b></p>	<p>The Lexington Public Schools have a relatively new school campus which includes adequate safe room facilities for occupants on campus. Further development is not planned at this time.</p>
<p><b>Moore</b></p>	<p>The City of Moore representative states that "growth patterns during the near future will show continued development although slow." Construction and development in Moore unrelated to the May 2013 storm is also high.</p> <p>The City of Moore City Manager states that "we were growing rapidly prior to the (May 2013) storm, and still are. Some of the indicators:</p> <ul style="list-style-type: none"> <li>• 34% growth in population from 2000-2010</li> <li>• Major road construction projects since 2005 or in progress including the rebuilding of <ul style="list-style-type: none"> <li>○ NW 5<sup>th</sup> between Markwell and I-35;</li> <li>○ NW 12<sup>th</sup> between Janeway and I-35;</li> <li>○ NE 12<sup>th</sup> between Eastern and Bryant;</li> <li>○ Santa Fe between SW 4<sup>th</sup> and SW 19<sup>th</sup>;</li> <li>○ Broadway between NW 5<sup>th</sup> and NE 18<sup>th</sup>;</li> <li>○ Eastern between NE 27<sup>th</sup> &amp; I-240 (includes both Moore and OKC);</li> <li>○ Intersection of SW 19<sup>th</sup> &amp; Telephone Rd.</li> </ul> </li> <li>• \$10 million project since 2005 to reconstruct Fire Stations #1 &amp; #3, and construction of a new Fire Headquarters and Fire Station #4;</li> <li>• \$55 million project since 2005 to construct a new Wastewater Treatment Plant;</li> <li>• \$15 million project since 2005 to construct a new Public Safety Center;</li> <li>• \$26 million project under way to build a new Central Park / Community Center / Aquatics facility.</li> </ul> <p>All of the above projects are improvements to infrastructure and public safety issues.</p> <p>Adding to that, the number of building permits issued in 2013 from January 1<sup>st</sup> through November 19<sup>th</sup>:</p> <ul style="list-style-type: none"> <li>• Single family homes: 2012 = 205 vs. 2013 = 249</li> <li>• Commercial: 2012 = 21 vs 2013 = 23</li> </ul> <p>From May 21, 2013 to November 19, 2013, the city has issued:</p> <ul style="list-style-type: none"> <li>• 332 building permits for new single family homes to replace homes lost in the May 20 tornado;</li> <li>• 418 remodeling permits to repair homes damaged in the May 20 tornado;</li> <li>• 11 building permits for new commercial buildings to replace those lost in the May 20 tornado; including several critical facilities (e.g., hospital, clinics, etc.)</li> </ul>

JURISDICTION	COMMENTS REGARDING CURRENT DEVELOPMENT
	<ul style="list-style-type: none"> <li>6 remodeling permits to repair commercial buildings lost in the May 20 tornado.</li> </ul>
<b>Moore Public Schools</b>	<p>Additional developments at Moore Public Schools include construction of two new elementary schools and a junior high school PRIOR/UNRELATED to the storm, PLUS the rebuilding of Plaza Towers and Briarwood Schools, a total of FIVE new schools (in addition to rebuilding of the gym and major repairs to the main building at Highland East Jr High; MAJOR repairs to the Administration building, and rebuilding of the Information Technology building).</p> <p>Improved construction methods along with proposed safe rooms will enhance the safety of occupants in the buildings.</p>
<b>Noble</b>	<p>Since the approval of the previous Cleveland County Hazard Mitigation Plan, the City of Noble has not altered its priorities or endeavors relating to its vulnerabilities. The city currently has made no changes in policy relating to development in hazard prone areas.</p>
<b>Noble Public Schools</b>	<p>Noble Public Schools has completed the Noble High School and Hubbard Elementary School addition and renovation projects funded by the 2010 School Improvement Bond! These projects have provided much-needed classroom space as well as a modernized child nutrition venue and state-of-the-art athletic facilities.</p> <p>The Noble Public School system uses their website and other methods of securing public opinions via flyers and surveys. These are intended to help address planning and implementation of various projects for the schools.</p>
<b>Norman and Norman Public Schools</b>	<p>The City Engineer and Planning and Development Department for the City of Norman indicate that expansion and development for the City of Norman is primarily driven by private developers expanding new housing areas. The highest proportion of this development is currently in the northwest quadrant of the city with approximately 1,500 new homes slated for construction. Analysis of this development shows that none of this expansion will involve the hazard prone areas of Cleveland County or the City of Norman. In fact, the City of Norman maintains some of the strictest building and development codes in the State of Oklahoma. For instance, where standard flood plain development requires that base elevation be at least one foot above the base flood elevation (BFE) level, the city requires construction to be at least two feet above BFE.</p> <p>Moderate expansion is anticipated in the northeast quadrant but, again, strict development codes preclude development into any of the hazard prone areas identified by the City of Norman.</p>

<b>JURISDICTION</b>	<b>COMMENTS REGARDING CURRENT DEVELOPMENT</b>
<b>Slaughterville</b>	Slaughterville expects no new development during the next three to five years which would affect infrastructure or town expansion. Since the last HM plan development, Slaughterville has been impacted by tornados in 2010 and a fire storm in 2012 which became a major federal disaster declaration. Based upon the response and recovery from those disasters, the Town of Slaughterville believes that it is pursuing the necessary activities through mitigation actions shown in this plan. In addition, these events have helped to identify local critical facilities which were relevant in the response to these disasters.
<b>All public schools districts: Does not include Lexington</b>	** Because of the massive tornado events of May, 2013, much discussion is evolving regarding the establishment of safe rooms in public schools and other public facilities. The Oklahoma Department of Education is conducting a series of surveys, obtaining public opinion and taking other efforts to create funding mechanisms and control factors for these safe room projects. Discussion includes the possibility of local bond issues, state wide bond issues, HMGP funds, private donation funding, HUD funds and many other options. These discussions are creating many options, so the schools districts are currently in research mode to determine their course of action. Therefore, distinct projects have not been identified while this research is ongoing.
<b>Little Axe Schools Robin Hill Schools</b>	Although Little Axe and Robin Hill Schools are not included in the Norman Public School District, they are actually located within the city limits of the City of Norman. Any expansion, development of infrastructure or construction, etc., is controlled by the City of Norman. No changes to their mitigation activities is planned. However, please see the general disclaimer regarding the potential for construction of safe rooms for all public schools.

## **CHAPTER FOUR**

### **Mitigation Strategies**

#### **Local Hazard Mitigation Goals**

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The Cleveland County Hazard Mitigation Planning Team reviewed and analyzed the goals of the plan and found them unclear in their intent. The goals were redefined at the first team meeting and reviewed following risk assessment studies. The goals listed below were determined to reflect the objectives of the participating jurisdictions and the State of Oklahoma in reducing the impact of hazards throughout the county. The goals and suggested actions were developed by the Hazard Mitigation Planning Team with the assistance of the chief elected officials of each entity. The selected projects should address these listed goals.

- Goal 1: Protect lives and property**
- Goal 2: To improve or enhance emergency services**
- Goal 3: To prevent or reduce the effects of natural hazards/disasters**
- Goal 4: To identify and protect critical facilities in Cleveland County**
- Goal 5: To develop or improve structures to become a more disaster resistant county**
- Goal 6: To provide more public awareness of the natural disaster threat.**

During the risk assessment phase of the planning process, the Cleveland County Hazard Mitigation Planning Team evaluated various mitigation strategies that could be feasible for use in Cleveland County. Historical references from residents concerning flooding and specific locations were discussed. Research and references to the print media proved to be ineffective, due to their lack of archive material. The most reliable local historical information available was contained in archives of the Emergency Management Offices in Cleveland County and local jurisdictions, federally declared disasters (FEMA website) and National Climatic Data Center (NCDC) records. Wildfire data was collected from the Oklahoma State Fire Marshal's office. The selection of the projects was based on the cost benefit of the action and what could be done in the community. Each community will make their decision at the time of implementation based upon the community's capability at the time.

#### **National Flood Insurance Program Participation**

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Cleveland County, Lexington, Moore, Noble, Norman, and Slaughterville are currently participating members of the NFIP. The Town of Etowah has never been mapped and is not a member of the NFIP. Schools are not eligible for NFIP participation but their flood insurance

rates are based upon the participation of their community. The following table shows the date each jurisdiction became a member of the NFIP and the effective map date.

Jurisdiction	Current Effective Map Date	Regular or Emergency Date
Cleveland County	9/26/08	06/01/89
Lexington	9/26/08	12/02/80
Moore	9/26/08	12/02/80
Noble	9/26/08	07/02/81
Norman	9/26/08	11/01/79
Slaughterville	9/26/08	04/15/92
Etowah	Not Mapped	

There are four identified Hazard Mitigation Action Items addressed in the Cleveland County Hazard Mitigation Plan incorporating flood plain activity and the NFIP. The four action items are:

- Public Awareness / Education Book
- Relocate Mobile Home Park
- Property Acquisition in Flood Plain
- Maintain Floodplain Administrator

Cleveland County, Lexington, Moore, Noble, Norman, and Slaughterville are members of the NFIP and, as such, the citizens of Cleveland County and member jurisdictions are eligible to purchase flood insurance through the NFIP. This is an economical advantage to the citizens of Cleveland County. Flood insurance through independent insurance carriers would be prohibitive due to cost, if available at all. Cleveland County, Lexington, Moore, Noble, Norman, and Slaughterville will continue their participation in the NFIP and continue to maintain and update floodplain ordinances in line with NFIP requirements. Floodplain ordinances will continue to be enforced in Special Flood Hazard Areas (SFHAs) to maintain compliance with NFIP requirements. County, city, and town officials will continue to promote and encourage flood insurance and public participation in the NFIP.

## Mitigation Action Plan

This chapter identifies specific actions to achieve the goals of Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville, The University of Oklahoma, Moore-Norman

Technology Center and all Public School Districts in Cleveland County; an appropriate lead person for each action, funding sources, and related hazards.

During the risk assessment phase of the planning process, the Cleveland County Hazard Mitigation Planning Team evaluated various mitigation strategies that may be feasible in Cleveland County. The selection of the projects was based on the benefits and cost effectiveness of the action and what could be done in the county and participating communities.

## Mitigation Projects

Many of the mitigation projects identified would offer relief for multiple hazards. Outdoor warning devices most certainly would be significant during tornado warning periods. Also, this means could be utilized for flash flooding alerts. Low water bridges, if corrected, would not only improve transportation for residents during heavy rain periods, but would provide a more direct route for use by responders than is currently utilized. Certainly, sheltering would have multiple hazard usage. Each project listed below shows the related hazards.

## Current Mitigation Projects

The following projects are the currently in progress, continuing, deferred, and new projects that were included in the action projects for the 2013 Cleveland County update. Projects that dealt with the hazard of Expansive Soils were removed.

### Action Project 1 – Individual Safe Room Program

<b>Description</b>	Provide a safe room rebate program to the citizens of Cleveland County and participating jurisdictions to allow them to install safe rooms in their residences and shelter in place.
<b>Hazards Addressed</b>	High Winds, Tornado
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville
<b>Responsible Party</b>	County and local emergency management, elected officials
<b>Funding Sources</b>	HMGP, county and local funds, citizens
<b>Current Action Status</b>	Some safe rooms have been completed, others are needed, NOI's Submitted

### Action Project 2 – Outdoor Early Warning Devices

<b>Description</b>	Install additional outdoor warning devices as needed to ensure adequate warning to citizens during an impending hazardous event. Replace older units with newer, technologically advanced devices.
<b>Hazards Addressed</b>	High Winds, Tornado
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville, Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Robin Hill PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	County and local emergency management, school administration
<b>Funding Sources</b>	HMGP, PDM, CDBG, REAP, County, Local, and School Funds
<b>Current Action Status</b>	Some installed, others still needed

### Action Project 3 – Emergency Generator for Critical Facilities

<b>Description</b>	Install emergency backup generator at critical facilities to mitigate impact from natural hazards causing power outages allowing critical facilities to remain operational.
<b>Hazards Addressed</b>	Earthquake, Extreme Heat, Hail, High Wind, Lightning, Wildfire, Winter Storm, Tornado
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville,
<b>Responsible Party</b>	County and local emergency management, school administrators
<b>Funding Sources</b>	HMGP, PDM, REAP, CDBG, county school and local funds
<b>Current Action Status</b>	Some completed, others needed

### Action Project 3A – Emergency Generator for Critical Facilities

<b>Description</b>	Install emergency backup generator at critical facilities to mitigate impact from natural hazards causing power outages allowing critical facilities to remain operational.
<b>Hazards Addressed</b>	Earthquake, Extreme Heat, Hail, High Wind, Lightning, Winter Storm, Tornado
<b>Jurisdictions Affected</b>	Lexington PS, Little Axe PS, Robin Hill PS, Moore PS, Noble PS, Norman PS, Moore-Norman Technology Center, University of Oklahoma
<b>Responsible Party</b>	County and local emergency management, school administration
<b>Funding Sources</b>	HMGP, PDM, REAP, CDBG, school funds
<b>Current Action Status</b>	Some completed, others needed

### Action Project 4 – Community / School Safe Rooms

<b>Description</b>	Install safe rooms as needed to protect students, staff, and visitors for their protection in the event of a tornado.
<b>Hazards Addressed</b>	High Winds, Tornado
<b>Jurisdictions Affected</b>	Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Robin Hill PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	County and local emergency management, School Administration
<b>Funding Sources</b>	HMGP, school, county and local funds
<b>Current Action Status</b>	Project modified to meet the needs of participating jurisdictions



### Action Project 5 – Protective Crosswalks for Schools

<b>Description</b>	Install protective crosswalks to protect students, staff, and visitors for protection in the event of a tornado.
<b>Hazards Addressed</b>	High Winds, Tornado
<b>Jurisdictions Affected</b>	Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Robin Hill PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	County and local emergency management, School Administration
<b>Funding Sources</b>	HMGP, county and local funds, school funds
<b>Current Action Status</b>	New action project for plan update

### Action Project 6 – Weather Monitoring Equipment (Tied with Fiber Optics)

<b>Description</b>	Install weather monitoring equipment to provide early warning to emergency services for determining if public warning is justified.
<b>Hazards Addressed</b>	Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County, Lexington, Moore, Noble, Norman
<b>Responsible Party</b>	County and local emergency management
<b>Funding Sources</b>	HMGP, PDM, CDBG, REAP, county and local funds
<b>Current Action Status</b>	New project for plan update

**Action Project 6A – Weather Monitoring Equipment (Tied with Fiber Optics)**

<b>Description</b>	Install weather monitoring equipment to provide early warning to emergency services for determining if public warning is justified.
<b>Hazards Addressed</b>	Extreme Heat, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Etowah, Slaughterville
<b>Responsible Party</b>	Local emergency management
<b>Funding Sources</b>	HMGP, PDM, CDBG, REAP, local funds
<b>Current Action Status</b>	New project for plan update

**Action Project 7 – Tone Alert Radio Warning System**

<b>Description</b>	Implement a tone-alert radio system to provide alerting and warning information to governmental, educational, business, and other large-census locations throughout the county and participating jurisdictions.
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County, Norman
<b>Responsible Party</b>	Emergency Management and elected officials
<b>Funding Sources</b>	HMGP, Local funds
<b>Current Action Status</b>	In progress, completed in City of Moore, Modified to include other participating jurisdictions

### Action Project 7A – Tone Alert Radio Warning System

<b>Description</b>	Implement a tone-alert radio system to provide alerting and warning information to governmental, educational, business, and other large-census locations throughout the county and participating jurisdictions.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Lexington, Noble, Slaughterville
<b>Responsible Party</b>	Emergency Management and elected officials
<b>Funding Sources</b>	HMGP, Local funds
<b>Current Action Status</b>	In progress, completed in City of Moore, Modified to include other participating jurisdictions

### Action Project 7B – Tone Alert Radio Warning System

<b>Description</b>	Implement a tone-alert radio system to provide alerting and warning information to governmental, educational, business, and other large-census locations throughout the county and participating jurisdictions.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Etowah
<b>Responsible Party</b>	Emergency Management and elected officials, School Administration
<b>Funding Sources</b>	HMGP, Local and school funds
<b>Current Action Status</b>	In progress, completed in City of Moore, Modified to include other participating jurisdictions

### Action Project 7C – Tone Alert Radio Warning System

<b>Description</b>	Implement a tone-alert radio system to provide alerting and warning information to governmental, educational, business, and other large-census locations throughout the county and participating jurisdictions.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Moore-Norman Technology Center, University of Oklahoma
<b>Responsible Party</b>	Emergency Management and elected officials, School Administration
<b>Funding Sources</b>	HMGP, Local and school funds
<b>Current Action Status</b>	In progress, completed in City of Moore, Modified to include other participating jurisdictions

### Action Project 7D – Tone Alert Radio Warning System

<b>Description</b>	Implement a tone-alert radio system to provide alerting and warning information to governmental, educational, business, and other large-census locations throughout the county and participating jurisdictions.
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Robin Hill PS
<b>Responsible Party</b>	Emergency Management and elected officials
<b>Funding Sources</b>	HMGP, Local funds
<b>Current Action Status</b>	In progress, completed in City of Moore, Modified to include other participating jurisdictions

### Action Project 8 – Establish Water Lines / Supply

<b>Description</b>	The County will collaborate with the local agriculturalist and agriculture committee in determining if the water lines and water supply amount is sufficient. The county will install new water lines where water supply is not sufficient enough to provide adequate water for citizens and for fighting wildfire.
<b>Hazards Addressed</b>	Drought, Wildfire
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	County Agriculture Board
<b>Funding Sources</b>	HMGP, county funds
<b>Current Action Status</b>	Some projects currently in progress

### Action Project 9 – Fire Awareness Program

<b>Description</b>	The participating jurisdictions will collaborate with their local fire departments to establish a program to reduce the risk of wildfires. This program will inform the citizens of how to prevent and minimize the effects of wildfires.
<b>Hazards Addressed</b>	Wildfire
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville, Little Axe PS, Noble PS, Moore-Norman Technology Center, University of Oklahoma
<b>Responsible Party</b>	Local fire departments, Emergency Management, School Administrators
<b>Funding Sources</b>	HMGP, county, school and local funds
<b>Current Action Status</b>	In progress

**Action Project 10 – StormReady Business**

<b>Description</b>	This project proposes a public-private partnership in increasing the awareness and preparedness of local businesses and other high-census locations by establishing a "storm ready certification" process.
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County, Norman
<b>Responsible Party</b>	County Emergency Management
<b>Funding Sources</b>	HMGP, local government and business funds
<b>Current Action Status</b>	Ongoing and continuing

**Action Project 10A – StormReady Business**

<b>Description</b>	This project proposes a public-private partnership in increasing the awareness and preparedness of local businesses and other high-census locations by establishing a "storm ready certification" process.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Lexington, Moore, Noble, Slaughterville
<b>Responsible Party</b>	Local Emergency Management
<b>Funding Sources</b>	HMGP, local government and business funds
<b>Current Action Status</b>	Ongoing and continuing

### Action Project 10B – StormReady Business

<b>Description</b>	This project proposes a public-private partnership in increasing the awareness and preparedness of local businesses and other high-census locations by establishing a "storm ready certification" process.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Etowah
<b>Responsible Party</b>	Local Emergency Management
<b>Funding Sources</b>	HMGP, local government and business funds
<b>Current Action Status</b>	Ongoing and continuing

### Action Project 11 – Mass Communications System

<b>Description</b>	Install a mass communications system to allow for rapid notification of the public during an impending hazardous event. Notify parents, teachers, and students of hazardous events and supply instructions as to course of action.
<b>Hazards Addressed</b>	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County, Norman
<b>Responsible Party</b>	County elected officials
<b>Funding Sources</b>	HMGP, County funds
<b>Current Action Status</b>	New action project for plan update

### Action Project 11A – Mass Communications System

<b>Description</b>	Install a mass communications system to allow for rapid notification of the public during an impending hazardous event. Notify parents, teachers, and students of hazardous events and supply instructions as to course of action.
<b>Hazards Addressed</b>	Dam Failure, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Robin Hill PS
<b>Responsible Party</b>	School administration
<b>Funding Sources</b>	HMGP, County, Local, and School funds
<b>Current Action Status</b>	New action project for plan update

### Action Project 11B – Mass Communications System

<b>Description</b>	Install a mass communications system to allow for rapid notification of the public during an impending hazardous event. Notify parents, teachers, and students of hazardous events and supply instructions as to course of action.
<b>Hazards Addressed</b>	Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Lexington, Moore, Noble, Slaughterville
<b>Responsible Party</b>	Local elected officials
<b>Funding Sources</b>	HMGP, Local funds
<b>Current Action Status</b>	New action project for plan update



### Action Project 11C – Mass Communications System

<b>Description</b>	Install a mass communications system to allow for rapid notification of the public during an impending hazardous event. Notify parents, teachers, and students of hazardous events and supply instructions as to course of action.
<b>Hazards Addressed</b>	Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Etowah
<b>Responsible Party</b>	Local elected officials
<b>Funding Sources</b>	HMGP, Local funds
<b>Current Action Status</b>	New action project for plan update

### Action Project 11D – Mass Communications System

<b>Description</b>	Install a mass communications system to allow for rapid notification of the public during an impending hazardous event. Notify parents, teachers, and students of hazardous events and supply instructions as to course of action.
<b>Hazards Addressed</b>	Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	County and local elected officials, school administration
<b>Funding Sources</b>	HMGP, County, Local, and School funds
<b>Current Action Status</b>	New action project for plan update

### Action Project 12 – Wildfire Awareness / Prevention

<b>Description</b>	The County and participating jurisdictions will notify/publicize to local citizens wildfire awareness/education and restrictions from burning during specified days. The posting of a color coded system could be used denoting these days.
<b>Hazards Addressed</b>	Wildfire
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville,
<b>Responsible Party</b>	Local fire departments
<b>Funding Sources</b>	HMGP, county and local funds
<b>Current Action Status</b>	Project has been started and will be expanded

### Action Project 13 – Public Awareness / Education

<b>Description</b>	Develop, produce, and distribute a multi-hazard public awareness/education book describing all the natural hazards Cleveland County and participating jurisdictions are at risk from, precautions to take prior to a hazardous event, how to protect yourself during an event, actions to take following a hazard event and distribute the book to citizens.
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County, Norman
<b>Responsible Party</b>	County officials
<b>Funding Sources</b>	HMGP, County funds
<b>Current Action Status</b>	New Project

### Action Project 13A – Public Awareness / Education

<b>Description</b>	Develop, produce, and distribute a multi-hazard public awareness/education book describing all the natural hazards Cleveland County and participating jurisdictions are at risk from, precautions to take prior to a hazardous event, how to protect yourself during an event, actions to take following a hazard event and distribute the book to citizens.
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Robin Hill PS
<b>Responsible Party</b>	School administration
<b>Funding Sources</b>	HMGP, School funds
<b>Current Action Status</b>	New Project

### Action Project 13B – Public Awareness / Education

<b>Description</b>	Develop, produce, and distribute a multi-hazard public awareness/education book describing all the natural hazards Cleveland County and participating jurisdictions are at risk from, precautions to take prior to a hazardous event, how to protect yourself during an event, actions to take following a hazard event and distribute the book to citizens.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Lexington, Moore, Noble, Slaughterville
<b>Responsible Party</b>	Local elected officials
<b>Funding Sources</b>	HMGP, Local and School funds
<b>Current Action Status</b>	New Project

### Action Project 13C – Public Awareness / Education

<b>Description</b>	Develop, produce, and distribute a multi-hazard public awareness/education book describing all the natural hazards Cleveland County and participating jurisdictions are at risk from, precautions to take prior to a hazardous event, how to protect yourself during an event, actions to take following a hazard event and distribute the book to citizens.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Etowah
<b>Responsible Party</b>	School and Local elected officials
<b>Funding Sources</b>	HMGP, School and Local funds
<b>Current Action Status</b>	New Project

### Action Project 13D – Public Awareness / Education

<b>Description</b>	Develop, produce, and distribute a multi-hazard public awareness/education book describing all the natural hazards Cleveland County and participating jurisdictions are at risk from, precautions to take prior to a hazardous event, how to protect yourself during an event, actions to take following a hazard event and distribute the book to citizens.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Etowah, Lexington PS, Little Axe PS, Robin Hill PS, Moore PS, Noble PS, Norman PS, Moore-Norman Technology Center, University of Oklahoma
<b>Responsible Party</b>	School and Local elected officials
<b>Funding Sources</b>	HMGP, School and Local funds
<b>Current Action Status</b>	New Project

**Action Project 14 – 72nd N of Slaughterville Road to Etowah Road (Roadway Flooding)**

<b>Description</b>	Flooding of roadway, inadequate drainage, and several locations along the four mile stretch. Improve drainage by raising road bed in some locations, installing larger tin horns, widening and deepening drainage ditches, install rip rap where needed.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Cleveland County, Slaughterville
<b>Responsible Party</b>	Cleveland County, Local elected officials
<b>Funding Sources</b>	Cleveland County, Local budget and mitigation funds
<b>Current Action Status</b>	Pending

**Action Project 15 – Window Film on Critical Facilities**

<b>Description</b>	Install tinted impact resistant window film to minimize the effects of high winds, tornadoes and other hazards.
<b>Hazards Addressed</b>	Earthquake, Extreme Heat, Hail, High Winds, Tornado
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville, Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Robin Hill PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	County commissioners, local elected officials, school administration
<b>Funding Sources</b>	HMGP, county, local, and school funds
<b>Current Action Status</b>	Deferred due to lack of funding. Project modified to meet the needs of participating jurisdictions.

### Action Project 16 – Drainage Improvements

<b>Description</b>	The County and jurisdictions will review the infrastructure with the public works departments bi-annually to minimize flooding, addressing and mitigating such items as drainage improvements and creating reservoir ponds in heavy residential/commercial developments.
<b>Hazards Addressed</b>	Dam Failure, Flood
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	Emergency Management
<b>Funding Sources</b>	HMGP, county and local funds
<b>Current Action Status</b>	Ongoing and continuing

### Action Project 16A – Drainage Improvements

<b>Description</b>	The County and jurisdictions will review the infrastructure with the public works departments bi-annually to minimize flooding, addressing and mitigating such items as drainage improvements and creating reservoir ponds in heavy residential/commercial developments.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Lexington, Moore, Noble, Norman, Slaughterville
<b>Responsible Party</b>	Emergency Management, local elected officials
<b>Funding Sources</b>	HMGP, county and local funds
<b>Current Action Status</b>	Ongoing and continuing as locations are identified

**Action Project 17 – Drainage Bridge Structure (84th and Lewis)**

<b>Description</b>	84th and Lewis intersection project. Deep creek at intersection, accident prone, improved line of sight needed
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	Cleveland County Commissioners
<b>Funding Sources</b>	Cleveland County and mitigation funds
<b>Current Action Status</b>	Pending

**Action Project 18 – Drainage Bridge Structure (Eastern & Indian Hills)**

<b>Description</b>	Eastern and Indian Hills project. Deep creek at intersection, accident prone, improved line of sight needed
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	Cleveland County Commissioners
<b>Funding Sources</b>	Cleveland County and mitigation funds
<b>Current Action Status</b>	Pending

### Action Project 19 – Bury Electrical Distribution Lines

<b>Description</b>	The participating jurisdictions will collaborate with the local utilities to plan the installation of new underground power lines where possible.
<b>Hazards Addressed</b>	Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville
<b>Responsible Party</b>	County and local elected officials, local utility companies
<b>Funding Sources</b>	HMGP, county and local utility departments
<b>Current Action Status</b>	Deferred, lack of funding

### Action Project 20 – Maguire Road 144th-156th Project (roadway flooding)

<b>Description</b>	Flooding of roadway due to inadequate drainage Maguire Rd, west of 156th.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	Cleveland County Commissioners
<b>Funding Sources</b>	Cleveland County and mitigation funds
<b>Current Action Status</b>	Pending



**Action Project 21 – 72nd Ave South of Hwy 39 in Lexington**

<b>Description</b>	Flooding due to inadequate drainage of adjacent property 72nd Ave south of SH 39 in Lexington
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	Cleveland County Commissioners
<b>Funding Sources</b>	Cleveland County and mitigation funds
<b>Current Action Status</b>	Pending

**Action Project 22 – Portable Motorist Information Signs**

<b>Description</b>	Acquire portable changeable message signs (PCMS) to provide safety and mitigation information during hazard occurrences.
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County, Norman
<b>Responsible Party</b>	Elected officials
<b>Funding Sources</b>	HMGP, County funds
<b>Current Action Status</b>	New project for plan update

**Action Project 22A – Portable Motorist Information Signs**

<b>Description</b>	Acquire portable changeable message signs (PCMS) to provide safety and mitigation information during hazard occurrences.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Moore, Etowah
<b>Responsible Party</b>	Elected officials
<b>Funding Sources</b>	HMGP, Local funds
<b>Current Action Status</b>	New project for plan update

**Action Project 22B – Portable Motorist Information Signs**

<b>Description</b>	Acquire portable changeable message signs (PCMS) to provide safety and mitigation information during hazard occurrences.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Moore PS, Norman PS, Moore-Norman Career Technology Center
<b>Responsible Party</b>	School administration
<b>Funding Sources</b>	HMGP, School funds
<b>Current Action Status</b>	New project for plan update

**Action Project 23 – Establish Routine Dam Checks**

<b>Description</b>	The county will establish criteria for the local water resource board to check the status of county dams and their structure on a bi-annual basis.
<b>Hazards Addressed</b>	Dam Failure, Flood
<b>Jurisdictions Affected</b>	Cleveland County, Norman
<b>Responsible Party</b>	Floodplain Manager
<b>Funding Sources</b>	HMGP, County and city funds
<b>Current Action Status</b>	Ongoing and continuing

**Action Project 24 – Pipeline Identification**

<b>Description</b>	The county will provide a yearly check on the location of the pipelines within the county. In addition, they will also provide a geographic map denoting high risk areas for pipeline ruptures.
<b>Hazards Addressed</b>	Earthquake
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	County Emergency Management
<b>Funding Sources</b>	HMGP, County funds
<b>Current Action Status</b>	Ongoing and continuing

### Action Project 25 – Convert Outdoor Warning System to Solar Power

<b>Description</b>	Install additional outdoor warning devices as needed to ensure adequate warning to citizens during an impending hazardous event. Convert older units to newer, technologically advanced systems using solar power.
<b>Hazards Addressed</b>	High Winds, Tornado
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville, Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Robin Hill PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	County and local emergency management, school administration
<b>Funding Sources</b>	HMGP, PDM, CDBG, REAP, County, Local, and School Funds
<b>Current Action Status</b>	Modified project for plan update.

### Action Project 26 – Master UPS System for Critical Facilities

<b>Description</b>	Acquisition of Master Uninterruptible Power Systems for Moore City Hall, Moore Fire Headquarters, Moore Public Works buildings.
<b>Hazards Addressed</b>	Extreme Heat, Flood, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Moore, Moore PS
<b>Responsible Party</b>	City of Moore
<b>Funding Sources</b>	HMGP, PDM, City and school funds
<b>Current Action Status</b>	New project

**Action Project 27 – Drainage Project (Little River 1200-19th St.)**

<b>Description</b>	Dredge, reshape and re-slope Little River channel between approximately SW 12th and SW 19th in the City of Moore.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Cleveland County, Moore
<b>Responsible Party</b>	Cleveland County, City of Moore
<b>Funding Sources</b>	HMGP, PDM, FMA, City and County funds
<b>Current Action Status</b>	New project

**Action Project 28 – Drainage Project w/ Norman (Telephone to I-35)**

<b>Description</b>	Realign, reshape and re-slope drainage channel between I-35 and Telephone Rd/36th NW on the Moore/Norman boundary. This is to include replacement of vegetation to prohibit additional siltation.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Cleveland County, Moore, Norman
<b>Responsible Party</b>	Cleveland County, City of Moore, City of Norman
<b>Funding Sources</b>	HMGP, PDM, FMA, City and County funds
<b>Current Action Status</b>	New project

### **Action Project 29 – Pedestrian Bridge Structure (Little River)**

<b>Description</b>	Construct a pedestrian bridge structure over the Little River in the area of SW 12th. This mitigates hazard to school children walking to nearby Plaza Towers Elementary School, hazard to other pedestrian traffic to nearby park, residential area and businesses, and hazard to emergency responders working on either side of the river.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Moore, Moore PS
<b>Responsible Party</b>	City of Moore
<b>Funding Sources</b>	HMGP, PDM, FMA, CDBG, City funds
<b>Current Action Status</b>	New project

### **Action Project 30 – Drainage Bridge Structure (34th St.)**

<b>Description</b>	Replace low water crossing of the Little River with a properly sized box structure. This area has seen explosive growth and tremendous increase in vehicle traffic.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Cleveland County, Moore, Norman
<b>Responsible Party</b>	City of Moore, City of Norman, Cleveland County
<b>Funding Sources</b>	HMGP, PDM, FMA, Federal/State/Local bridge funds, local funding
<b>Current Action Status</b>	New project

**Action Project 31 – Shelter for City Vehicles**

<b>Description</b>	Install overhead covers for City vehicle parking at Moore Public Works, Moore City Hall, and Moore Public Safety Center to protect response and recovery equipment and lessen the impact of hail and other airborne weather hazards.
<b>Hazards Addressed</b>	Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Moore
<b>Responsible Party</b>	City of Moore
<b>Funding Sources</b>	HMGP, PDM, local funds
<b>Current Action Status</b>	New project

**Action Project 32 – Citywide Master Drainage Study**

<b>Description</b>	Conduct a citywide master drainage study in the City of Moore to determine and initiate the best flood control mitigation measures for the City of Moore.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	City of Moore
<b>Responsible Party</b>	City of Moore
<b>Funding Sources</b>	HMGP, PDM, FMA, City funds
<b>Current Action Status</b>	New project

### Action Project 33 – Public Education Equipment

<b>Description</b>	Purchase various audio-visual, training, and simulation equipment to enhance public education efforts concerning hazards and mitigation.
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County, Norman
<b>Responsible Party</b>	Emergency Management, county elected officials
<b>Funding Sources</b>	HMGP, PDM, other Federal/State/local/private sources
<b>Current Action Status</b>	New project

### Action Project 33A – Public Education Equipment

<b>Description</b>	Purchase various audio-visual, training, and simulation equipment to enhance public education efforts concerning hazards and mitigation.
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Robin Hill PS
<b>Responsible Party</b>	Emergency Management, county and local elected officials, school administration
<b>Funding Sources</b>	HMGP, PDM, other Federal/State/local/private sources
<b>Current Action Status</b>	New project



**Action Project 33B – Public Education Equipment**

<b>Description</b>	Purchase various audio-visual, training, and simulation equipment to enhance public education efforts concerning hazards and mitigation.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Lexington, Moore, Noble
<b>Responsible Party</b>	Emergency Management, local elected officials
<b>Funding Sources</b>	HMGP, PDM, other Federal/State/local/private sources
<b>Current Action Status</b>	New project

**Action Project 33C – Public Education Equipment**

<b>Description</b>	Purchase various audio-visual, training, and simulation equipment to enhance public education efforts concerning hazards and mitigation.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Etowah, Slaughterville
<b>Responsible Party</b>	Emergency Management, county and local elected officials, school administration
<b>Funding Sources</b>	HMGP, PDM, other Federal/State/local/private sources
<b>Current Action Status</b>	New project

### Action Project 33D – Public Education Equipment

<b>Description</b>	Purchase various audio-visual, training, and simulation equipment to enhance public education efforts concerning hazards and mitigation.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	Emergency Management, county and local elected officials, school administration
<b>Funding Sources</b>	HMGP, PDM, other Federal/State/local/private sources
<b>Current Action Status</b>	New project

### Action Project 34 – Public Information/Education On Hail

<b>Description</b>	The county and jurisdictions will provide the citizens with information on the effects of hail and safety precautions during an event.
<b>Hazards Addressed</b>	Hail
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville, Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Robin Hill PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	County and local emergency management, school administration
<b>Funding Sources</b>	County, school and local funds
<b>Current Action Status</b>	Ongoing and continuing

### Action Project 35 – Choteau Creek Property Buyout

<b>Description</b>	The City of Lexington will purchase a property which is consistently flooded by Choteau Creek.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Lexington
<b>Responsible Party</b>	City of Lexington
<b>Funding Sources</b>	HMGP, PDM, RFC, SRL, FMA, Local funds
<b>Current Action Status</b>	Deferred, lack of funding

### Action Project 36 – Stream Monitoring on Little River

<b>Description</b>	Install a stream monitoring gauge on the Little River in the area of SW 34th St. to monitor stream height and flow for drought and flooding events.
<b>Hazards Addressed</b>	Drought, Flood
<b>Jurisdictions Affected</b>	City of Moore
<b>Responsible Party</b>	City of Moore
<b>Funding Sources</b>	HMGP, PDM, USGS/NWS funds, local funds
<b>Current Action Status</b>	New project

### Action Project 37 – Cooling Stations / Facilities

<b>Description</b>	The County and local jurisdictions will work with local churches and other non-profit organizations to inform citizens of designated buildings providing shelter during extreme heat.
<b>Hazards Addressed</b>	Extreme Heat
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville, Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Robin Hill PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	County and Local Emergency Management, school administration
<b>Funding Sources</b>	County, school and local funds
<b>Current Action Status</b>	Ongoing and continuing

### Action Project 38 - Inhoffe Creek Channel Improvements

<b>Description</b>	Stabilize the banks of the channel and purchase access
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Norman
<b>Responsible Party</b>	City of Norman Public Works
<b>Funding Sources</b>	HMGP, PDM, Local Funds
<b>Current Action Status</b>	Deferred, lack of funding

### Action Project 39 – Extreme Heat Education

<b>Description</b>	Distribute literature throughout the county (i.e., public library, city halls, local/county schools, etc.) informing the citizens on procedures to implement during extreme heat.
<b>Hazards Addressed</b>	Extreme Heat
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville, Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Robin Hill PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	County and local elected officials, school superintendents
<b>Funding Sources</b>	HMGP, county, school and local funds
<b>Current Action Status</b>	Ongoing and continuing

### Action Project 40 – New/Existing Building Updates

<b>Description</b>	Cleveland County will establish a public awareness of updated building structures and architectural strategies to mitigate against all profiled hazards, and provide information to the people concerning specific hazards (i.e., extreme heat, earthquakes, etc.).
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County, Norman
<b>Responsible Party</b>	Cleveland Economic Development, County officials
<b>Funding Sources</b>	HMGP, County funds
<b>Current Action Status</b>	Updated to meet current needs of the jurisdiction

**Action Project 41 – Drainage Project 1400 Nail Parkway**

<b>Description</b>	Work to improve drainage in the flood-prone area of Nail Parkway north of NE 12th in Moore.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Moore
<b>Responsible Party</b>	City of Moore
<b>Funding Sources</b>	HMGP, PDM, local funds
<b>Current Action Status</b>	New project

**Action Project 42 – Relocate Mobile Home Parks**

<b>Description</b>	Flooding of mobile homes in park due to placement of homes in floodplain, Relocate
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	Cleveland County
<b>Funding Sources</b>	County and mitigation funds
<b>Current Action Status</b>	Pending

**Action Project 43 - Drainage Project – Markwell**

<b>Description</b>	Work to improve drainage in the flood-prone area along Markwell north of SW 4th in Moore.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Moore
<b>Responsible Party</b>	City of Moore
<b>Funding Sources</b>	HMGP, PDM, local funds
<b>Current Action Status</b>	New project

**Action Project 44 – Property Acquisition in Flood Plain**

<b>Description</b>	Acquire property located within the flood plain that floods frequently. Remove or demolish structures and turn acquisitions into open spaces.
<b>Hazards Addressed</b>	Dam Failure, Flood
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	County Elected Officials
<b>Funding Sources</b>	HMGP, PDM, FMA, RFC, SRL, County funds
<b>Current Action Status</b>	New action project for plan update

### Action Project 44A – Property Acquisition in Flood Plain

<b>Description</b>	Acquire property located within the flood plain that floods frequently. Remove or demolish structures and turn acquisitions into open spaces.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Lexington, Moore, Noble, Norman, Slaughterville
<b>Responsible Party</b>	Local Elected Officials
<b>Funding Sources</b>	HMGP, PDM, FMA, RFC, SRL, Local funds
<b>Current Action Status</b>	New action project for plan update

### Action Project 45 – Parking Garage

<b>Description</b>	Construct a parking garage at the county courthouse to protect county employees and visitors to the courthouse from severe weather events.
<b>Hazards Addressed</b>	Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	Cleveland County elected officials
<b>Funding Sources</b>	County funds, HMGP
<b>Current Action Status</b>	Pending



### Action Project 46 - Web/Apps for Community Outreach

<b>Description</b>	Contract for the development and implementation of various internet and smartphone based applications to provide public awareness, education, and real-time alerting and information concerning natural hazards.
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Cleveland County, Norman
<b>Responsible Party</b>	Emergency management, county commissioners
<b>Funding Sources</b>	HMGP, PDM, other Federal/State/local/private funds, County funds
<b>Current Action Status</b>	New project

### Action Project 46A - Web/Apps for Community Outreach

<b>Description</b>	Contract for the development and implementation of various internet and smartphone based applications to provide public awareness, education, and real-time alerting and information concerning natural hazards.
<b>Hazards Addressed</b>	Dam Failure, Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Robin Hill PS
<b>Responsible Party</b>	Emergency management, school administration
<b>Funding Sources</b>	HMGP, PDM, other Federal/State/local/private funds, school funds
<b>Current Action Status</b>	New project

**Action Project 46B - Web/Apps for Community Outreach**

<b>Description</b>	Contract for the development and implementation of various internet and smartphone based applications to provide public awareness, education, and real-time alerting and information concerning natural hazards.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Lexington, Moore, Noble
<b>Responsible Party</b>	Emergency management, local elected officials
<b>Funding Sources</b>	HMGP, PDM, other Federal/State/local/private funds, local funds
<b>Current Action Status</b>	New project

**Action Project 46C - Web/Apps for Community Outreach**

<b>Description</b>	Contract for the development and implementation of various internet and smartphone based applications to provide public awareness, education, and real-time alerting and information concerning natural hazards.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storms
<b>Jurisdictions Affected</b>	Etowah, Slaughterville
<b>Responsible Party</b>	Emergency management, local elected officials, school administration
<b>Funding Sources</b>	HMGP, PDM, other Federal/State/local/private funds, Local funds
<b>Current Action Status</b>	New project

### Action Project 46D - Web/Apps for Community Outreach

<b>Description</b>	Contract for the development and implementation of various internet and smartphone based applications to provide public awareness, education, and real-time alerting and information concerning natural hazards.
<b>Hazards Addressed</b>	Drought, Earthquake, Extreme Heat, Hail, High Winds, Lightning, Tornado, Winter Storms
<b>Jurisdictions Affected</b>	Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	Emergency management, local elected officials, school administration
<b>Funding Sources</b>	HMGP, PDM, other Federal/State/local/private funds, County, local and school funds
<b>Current Action Status</b>	New project

### Action Project 47 – Vegetation Management

<b>Description</b>	Encourage and assist in the removal and control of the invasive eastern red cedar population and other wild land growths to control wildfire and water consumption.
<b>Hazards Addressed</b>	Drought, Wildfire
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville,
<b>Responsible Party</b>	County, school and local elected officials
<b>Funding Sources</b>	HMGP, Forestry, County, Local budgets
<b>Current Action Status</b>	New action project for plan update

### Action Project 47A – Vegetation Management

<b>Description</b>	Encourage and assist in the removal and control of the invasive eastern red cedar population and other wild land growths to control water consumption.
<b>Hazards Addressed</b>	Drought
<b>Jurisdictions Affected</b>	Lexington PS, Little Axe PS, Robin Hill PS, Moore PS, Noble PS, Norman PS, Moore-Norman Technology Center, University of Oklahoma
<b>Responsible Party</b>	County, school and local elected officials
<b>Funding Sources</b>	HMGP, Forestry, County, Local, School budgets
<b>Current Action Status</b>	New action project for plan update

### Action Project 48 – Drought Public Awareness

<b>Description</b>	Establish a working relationship with local newspapers, local radio stations, and county weather professionals to effectively communicate with county agricultural producers to protect crops and livestock.
<b>Hazards Addressed</b>	Drought
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	County Planning Committee
<b>Funding Sources</b>	HMGP, USDA, County funds
<b>Current Action Status</b>	Project modified to meet jurisdictional needs

### Action Project 49 – Earthquake Preparedness

<b>Description</b>	Provide documents and procedures to residents and contractors (residential/commercial) on minimizing effects of earthquakes
<b>Hazards Addressed</b>	Earthquake
<b>Jurisdictions Affected</b>	Cleveland County, Etowah, Lexington, Moore, Noble, Norman, Slaughterville, Lexington PS, Little Axe PS, Moore PS, Noble PS, Norman PS, Robin Hill PS, Moore-Norman Career Technology Center, Oklahoma University
<b>Responsible Party</b>	Emergency Management
<b>Funding Sources</b>	HMGP, County and local funds
<b>Current Action Status</b>	Ongoing and continuing

### Action Project 50 – Hail Damage Prevention Documentation

<b>Description</b>	The County will establish documentation on higher hail damage prevention standards with local contractors for residential and commercial buildings.
<b>Hazards Addressed</b>	Hail
<b>Jurisdictions Affected</b>	Cleveland County
<b>Responsible Party</b>	Emergency Management
<b>Funding Sources</b>	HMGP, County funds
<b>Current Action Status</b>	Ongoing and continuing, Combined with Public Awareness / Education Project

**Action Project 51 – Snow Fencing**

<b>Description</b>	Construct snow fencing along SE 34 <sup>th</sup> St. between Bryant and Sunnyslane Rd in the City of Moore.
<b>Hazards Addressed</b>	Winter Storms
<b>Jurisdictions Affected</b>	Moore
<b>Responsible Party</b>	City of Moore
<b>Funding Sources</b>	HMGP, PDM, local funds
<b>Current Action Status</b>	New project

**Action Project 52 – Box Structure Fairmoore Park**

<b>Description</b>	Construct a new box structure under Telephone Rd. in the area of Fairmoore Park to reduce the effects of flooding and erosion.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Moore
<b>Responsible Party</b>	City of Moore
<b>Funding Sources</b>	HMGP, PDM, local funds
<b>Current Action Status</b>	New project

### Action Project 53 – Maintain Floodplain Administrator

<b>Description</b>	Cleveland County will continue to maintain a floodplain administrator to oversee floodplain activities.
<b>Hazards Addressed</b>	Dam Failure, Flood
<b>Jurisdictions Affected</b>	Cleveland County, Norman
<b>Responsible Party</b>	County Commissioners
<b>Funding Sources</b>	County Funds
<b>Current Action Status</b>	New project for plan update

### Action Project 53A – Maintain Floodplain Administrators

<b>Description</b>	Lexington, Moore, Noble, Norman, and Slaughterville will continue to maintain a floodplain administrator to oversee floodplain activities.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Lexington, Moore, Noble, Slaughterville,
<b>Responsible Party</b>	Local Elected Officials
<b>Funding Sources</b>	Local Funds
<b>Current Action Status</b>	New project for plan update

**Action Project 54 – City of Norman Flood Projects**

<b>Description</b>	The City of Norman Has a Master Drainage Plan that was reviewed and contains 151 flood control projects to improve drainage and reduce flooding throughout the City of Norman included through this project.
<b>Hazards Addressed</b>	Flood
<b>Jurisdictions Affected</b>	Norman
<b>Responsible Party</b>	Norman Floodplain Administrator
<b>Funding Sources</b>	HMGP, PDM, FMA, RFC, SRL, Local funds
<b>Current Action Status</b>	New project for plan update

**Action Project 55 – Safe Room at Moore Brand Senior Center**

<b>Description</b>	Construct a safe room to serve those attending functions at the City of Moore's Brand Senior Center.
<b>Hazards Addressed</b>	Hail, High Winds, Tornado
<b>Jurisdictions Affected</b>	Moore
<b>Responsible Party</b>	City of Moore
<b>Funding Sources</b>	HMGP, PDM, CDBG, local funds
<b>Current Action Status</b>	New project



## Completed Mitigation Projects

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**The following projects found in the previous plan have been completed.**

### **Action Project 1 – Tin Horn on Maguire**

<b>Description</b>	Install new tin horns on Maguire east of 168 <sup>th</sup> to improve flow, reduce damage to road bed from standing water, and keep highway open for emergency vehicle access.
<b>Current Action Status</b>	Completed

### **Action Project 2 – Tone Alert Radio Warning System**

<b>Description</b>	Implement a tone-alert radio system to provide alerting and warning information to governmental, educational, business, and other large-census locations throughout the county and participating jurisdictions.
<b>Current Action Status</b>	Completed in City of Moore, Project still a viable project for other participating jurisdictions.

## Prioritization

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The Cleveland County Hazard Mitigation Planning Team identified several hazard mitigation projects to be included in the Hazard Mitigation Plan. These projects, along with the responsible agency, possible funding sources, and the hazards mitigated were listed previously.

The Cleveland County Hazard Mitigation Planning Team discussed the implementation of action projects in great detail and how they would be prioritized. Consideration was given to the cost-benefit of the projects (what benefits the project provided as compared to the cost of the project). Social and political factors were also considered (would the public at large and the elected officials support or oppose the project), and many other factors. All of the participants on the Hazard Mitigation Team representing the jurisdictions participating in the Cleveland County Hazard Mitigation Plan agreed that the priority for implementing action projects will depend on:

1. Available funding; and
2. Public and political pressures at the time projects are chosen.

## **CHAPTER FIVE**

### **PLAN MAINTENANCE**

#### **Monitoring, Evaluating, and Updating Plan**

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The Cleveland County Emergency Manager is the chairman of the CCHMPT and will be the primary person responsible for overseeing the Hazard Mitigation Plan and coordinating with the other jurisdictions where changes to their other planning mechanisms might enhance or interact with the Hazard Mitigation Plan.

The plan will be monitored, evaluated and updated annually during the five-year cycle with the assistance of Cleveland County's contractor. This will also occur at any time there is a disaster in order to determine the effectiveness in or changes to programs that might affect mitigation priorities. Beginning on the fourth year, the Cleveland County Emergency Management Director will make all plan revisions final and submit the updated Hazard Mitigation Plan to the State of Oklahoma Hazard Mitigation Division and FEMA for review and approval six months before the end of the fifth year so that the jurisdictions will maintain eligibility.

The following individuals will be responsible for monitoring and evaluating the plan, mitigation activities, and coordinating with County Emergency Management.

- Cleveland County Emergency Manager
- Moore Emergency Manager
- Noble Emergency Manager
- Norman Emergency Manager
- University of Oklahoma Emergency Manager
- Etowah Mayor
- Lexington City Manager
- Slaughterville Town Administrator
- School Superintendents for the Public School Districts

The individuals listed above will perform any necessary monitoring site visits on a monthly basis and will also be the lead contact for phone calls, scheduling of meetings, and will:

- Monitor the hazard analysis for changes and additions;
- Monitor objectives and determine if they meet current and expected hazardous conditions;
- Determine if there are any implementation problems such as social, technical, administrative, political, legal, economic, and environmental or coordination issues with other agencies.

The individuals listed above will evaluate the Natural Hazard Mitigation Plan every year to determine the effectiveness and/or progress of mitigation actions and the implementation of other actions.

Items covered during the evaluation process should include:

- Evaluate magnitude of risk and determine if it has changed;
- Evaluate current resources and determine if they are appropriate for implementing mitigation actions;
- Determine if there were any implementation problems, such as technical, political, legal, or coordination issues with other agencies;
- Evaluate goals, objectives, and current or expected conditions;
- Evaluate how other agencies and partners have participated;
  
- Evaluate mitigation actions and determine if outcome occurred as expected:
  - Was the intended purpose of the original mitigation action met?
  - Was the mitigation action met in the proposed timeline?
  - Did the listed agencies participate in the mitigation action?
  - Did the mitigation action stay within the proposed budget?

The above listed individuals will perform site visits as needed on projects involving their jurisdictions and will work closely with the County Emergency Manager to monitor and evaluate the Hazard Mitigation Plan.

Additionally, the County Emergency Management Director will give the Cleveland County Commissioners an update report annually. The report will highlight the results of the previously mentioned activities. The plan will remain an active and relevant document with continued public participation.

The public school districts as well as the technology centers and the University of Oklahoma are governed by rules, regulations and laws of the State of Oklahoma. State statutes at Section 487.3. Emergency Preparedness Grants (74 O.S. § 51.2a) and (74 O.S. § 51.2b) provides that

through the Department of Homeland Security grants, these learning institutions will be provided funding through grants to:

1. Public schools, private schools, technology center schools, and institutions of higher learning in the State of Oklahoma to encourage greater emergency preparedness, including, but not limited to, improvement of plans and procedures for natural and man-made disaster and emergencies, improvement of security on campus, at events, and with regard to buses and other transportation, and improvement of communications strategies and equipment; and
2. Local law enforcement, emergency management, disaster relief, and public health entities in the State of Oklahoma to encourage the active engagement of such entities with public schools, private schools, technology center schools, and institutions of higher learning in their efforts to improve emergency preparedness.

These institutions are tasked with preparing and maintaining planning mechanisms to provide enhanced preparedness and security for their campuses. These plans are updated on a yearly basis. In the planning process, their active hazard mitigation plan will be incorporated into other plans which meet state regulated criteria. Some of the plans are submitted through the Oklahoma Department of Education, while others are submitted and approved through the Department of Homeland Security. Information contained in all of the plans is inter-mingled to insure that all plans have common, updated data and directives. These plans will also be shared with the local emergency managers in order to assure that all relevant emergency agencies share the same guidance when responding to emergencies or disasters.

## **Implementation through Existing Programs**

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### **Cleveland County:**

The Emergency Operations Plan, Standard Operating Procedures and Continuity of Government Plans were reviewed and updated as scheduled/needed. Information obtained through the risk assessment of the Hazard Mitigation Plan was used in the annual update of these plans where applicable. None of the annual updates of the EOP and SOP's were found to have an effect on the Hazard Mitigation Plan. Information from the Capital Improvement Plan was used in the development of projects for the Hazard Mitigation Plan Update.

The Emergency Management Director will be responsible for monitoring the Emergency Operations Plan and integrating the Hazard Mitigation Plan into it along with any updates on an

annual basis. The Emergency Management Director will give the Cleveland County Commissioners monitoring reports annually. Changes from the Hazard Mitigation Plan and Emergency Operations Plan will be incorporated as applicable. The plan will remain an active and relevant document with continued public participation.

The County Emergency Manager is responsible for updating the EOP on an annual basis. As changes are made to the HMP they will be incorporated into the EOP at the annual update and noted in the HMP for change at the five year update. Changes made to the EOP are submitted to the County Commissioners for review and approval before being sent to the State Emergency Management Office.

**Town of Etowah:**

The Town of Etowah is a small town with a population of less than 100 people. Etowah has no other plans in place to consider in conjunction with the Hazard Mitigation Plan. They will continue to participate in the Hazard Mitigation Planning process however.

**City of Lexington:**

The Ordinances and following plans were reviewed and considered;

- **Capital Improvement Plans (CIP)**
- **Community Wildfire Protection Plan**
- **Economic Development Plan**
- **Emergency Operations Plan**

Also reviewed were the: zoning ordinances; subdivision ordinance and floodplain ordinance. Staffing at this time appears to be adequate although additional staff in the future may be necessary in Lexington.

Information obtained through the risk assessment of the Hazard Mitigation Plan will be used in the annual update of those plans. Information from those plans and the City Codes and Ordinances was considered in the Hazard Mitigation Plan update.

The City Manager will be responsible for monitoring the Emergency Operations Plan and integrating the Hazard Mitigation Plan into it along with any updates on an annual basis. The City Manager will give the city council monitoring reports annually. Changes from the Hazard Mitigation Plan and other plans will be incorporated as applicable. The plan will remain an active and relevant document with continued public participation.

The City Manager is responsible for updating the plans on an annual basis. As changes are made to the HMP they will be incorporated into the other plans at the annual update and noted in the HMP for change at the five year update.

**City of Moore:**

The **Emergency Operations Plan, Standard Operating Procedures, the Comprehensive Master Plan, the Storm Water Management Plan; the Debris Management Plan; the Continuity of Operations Plan and all Ordinances** were reviewed and information obtained through the risk assessment of the Hazard Mitigation Plan was incorporated into those plans where appropriate. Information from those plans was incorporated into the Hazard Mitigation Plan and referred to in the development of mitigation projects.

The Emergency Management Director will be responsible for monitoring the Emergency Operations Plan and coordinating with those responsible for the other plans listed previously for changes and integrating the Hazard Mitigation Plan into them along with any updates on an annual basis. The Emergency Management Director will work closely with the Cleveland County Emergency Manager to ensure changes to be made to the Hazard Mitigation Plan are readily available for the five year update. The plan will remain an active and relevant document with continued public participation. Changes will be made and the Hazard Mitigation Plan submitted to the state and FEMA for approval six months prior to the expiration date so the jurisdiction can maintain its eligibility.

**City of Noble:**

The **Storm Water Management Plan; Comprehensive Master Plan; Continuity of Government Plan; Emergency Operations Plan, Standard Operating Procedures, and City Codes and Ordinances** were reviewed and information obtained through the risk assessment of the Hazard Mitigation Plan was used in the annual update of these plans. None of the annual updates of the EOP, SOP's, or City Codes and Ordinances were found to have an effect on the Hazard Mitigation Plan.

The Emergency Management Director will be responsible for monitoring the Emergency Operations Plan and coordinating with other plan managers to integrate the Hazard Mitigation Plan into it along with any updates on an annual basis. The Emergency Management Director will give the City Manager monitoring reports annually. Changes from the Hazard Mitigation Plan and other plans will be incorporated as applicable. The plan will remain an active and relevant document with continued public participation.

The Emergency Manager is responsible for updating the EOP on an annual basis. As changes are made to the HMP they will be incorporated into the EOP at the annual update and noted in the HMP for change at the five year update.

**City of Norman:**

The Emergency Operations Plan, Standard Operating Procedures, Capital Improvement Plan, Comprehensive Master Plan, the Debris Management Plan, Storm Water Master Plan, Economic Development Plan, and city Ordinances including floodplain and zoning ordinances were reviewed and information obtained through the risk assessment of the Hazard Mitigation Plan and was incorporated into those plans where appropriate. Information from those plans was incorporated into the Hazard Mitigation Plan and referred to in the development of mitigation projects. The Transportation Plan is currently under development and Hazard Planning will be included where appropriate.

The Emergency Management Director will be responsible for monitoring the Emergency Operations Plan and coordinating with those responsible for the other plans listed previously for changes and integrating the Hazard Mitigation Plan into them along with any updates on an annual basis. The Emergency Management Director will work closely with the Cleveland County Emergency Manager to ensure changes to be made to the Hazard Mitigation Plan are readily available for the five year update. The plan will remain an active and relevant document with continued public participation. Changes will be made and the Hazard Mitigation Plan submitted to the state and FEMA for approval six months prior to the expiration date so the jurisdiction can maintain its eligibility.

**Town of Slaughterville:**

Even though the Town of Slaughterville is smaller than the other incorporated communities in Cleveland County, they have a number of plans and ordinances especially those established to manage building within the community. Slaughterville has established a Zoning Ordinances, Subdivision ordinances, floodplain ordinances, and review them regularly. They will also review these ordinances with the Hazard Mitigation Plan in consideration. The Emergency Operations Plan, and Standard Operating Procedures, were also reviewed and information obtained through the risk assessment of the Hazard Mitigation Plan was used in the update of those plans. They do not currently have some of the other plans some jurisdictions have.

The Town Administrator will be responsible for monitoring the other plans and integrating the Hazard Mitigation Plan into it along with any updates on an annual basis. Changes from the Hazard Mitigation Plan and other plans will be incorporated into each other as applicable. The plan will remain an active and relevant document with continued public participation.

Changes to the Emergency Operations Plan, Standard Operating Procedures, and City Codes and Ordinances will be noted in the HMP for change at the five year update.

**School Districts/Oklahoma University and Moore/Norman Technology Center:**

The Norman Public School District is the only district that has developed a Capital Improvement Plan while Lexington, Little Axe, Noble, Norman, Robin Hill school districts have all developed and maintain Comprehensive Master Plans. The University of Oklahoma and Moore/Norman Technology Center also maintain Capital Improvement Plans. Emergency Operations Plans and Standard Operating Plans will (along with the before mentioned plans) will continue to be reviewed and updated along with the Hazard Mitigation Plan. Prior to the beginning of each school year, all of the schools in Oklahoma (including technology centers and colleges/universities) develop updated budgets and comprehensive improvement plans. At that time each year, the superintendents of the schools included in this plan will review their pertinent portions of this plan to determine if events during the previous year have altered their vulnerabilities to capabilities and determine if they should alter their EOPs, SOPs. They will also review identified mitigation projects for their facility and include or update the projects into their budgets and improvement plans.

**Continued Public Participation and Involvement**

Public participation is an important part of the planning process and public input or the lack thereof can be instrumental in the success or failure of the plan. The public will be invited to participate in annual open forum meetings and will be notified through legal newspaper notices, mailings, and personal invitations by phone or email. The public input will be reviewed and, where appropriate, incorporated into the Hazard Mitigation Plan, consistent with the update schedule.

This Plan was developed under the direction of the CCHMPT with the support of their consultant, Hazard Mitigation Specialists, LLC. The draft plan was reviewed by the CCHMPT and made available for public comment both during and after the draft plan development process.

The personnel responsible for monitoring the implementation and evaluation of the necessity for updating the plan is the Cleveland County Emergency Management Director. The Emergency Management Director reports directly to the Cleveland County commissioners.

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# CLEVELAND COUNTY APPENDICES



## APPENDICES

### Appendix A – Plan Organization

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- Contact List
- Letters of Invitation
- Meeting Rosters, Meeting Minutes
- Meeting Notices/Publicity
- Participant contributions to planning process

### Appendix B – Maps

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- Cleveland County
- Town of Etowah
- City of Lexington
- City of Moore
- City of Noble
- City of Norman
- Town of Slaughterville
- Cleveland County School Districts
- University of Oklahoma
- FIRM Maps

### Appendix C – Critical Facilities

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- **NOT FOR PUBLIC VIEWING; REQUESTS FOR THIS INFORMATION MAY BE MADE TO THE CLEVELAND COUNTY EMERGENCY MANAGER**

## Appendix A – Plan Organization – Contact List

The listing given here reflects the contact information for the jurisdictions and interested / participating entities. Because they have shown an interest in this plan, we provide the listing of contact information although the persons reflected here may not be the official member of the hazard mitigation team for the jurisdiction or entity.

Charles McCown- [charlie@cityoflexington.com](mailto:charlie@cityoflexington.com)  
**City of Lexington – City Manager**

Denny Prince - [dprince@lexington.k12.ok.us](mailto:dprince@lexington.k12.ok.us)  
**Lexington Public Schools - Superintendent**

Jansen Idlett - [ohpidlett@gmail.com](mailto:ohpidlett@gmail.com)  
**City of Lexington – Fire Chief**

Bob Wade - [bobwade@sbcglobal.net](mailto:bobwade@sbcglobal.net)  
**City Of Noble – City Manager**

Gary Bonner [Chief@noblefire.org](mailto:Chief@noblefire.org)  
**City of Noble – Fire Chief**

Marsha Blair - [slaughterville@sbcglobal.net](mailto:slaughterville@sbcglobal.net)  
**Slaughterville – Town Administrator**

Jimmy Blair - [jblairsfd14@sbcglobal.net](mailto:jblairsfd14@sbcglobal.net)  
**Slaughterville Fire Dept. – Ass’t Chief – Emergency Manager**

Paul Long - [plongsfd17@hotmail.com](mailto:plongsfd17@hotmail.com)  
**Slaughterville Fire Dept. – Fire Chief**

Harlan Fipps- [ccspd@mbo.net](mailto:ccspd@mbo.net)  
**Cedar Country Fire Dept.- Fire Chief**

Steve Lewis - [steve.lewis@normanok.gov](mailto:steve.lewis@normanok.gov)  
**City of Norman – City Manager**

James Fullingim - [james.fullingim@normanok.gov](mailto:james.fullingim@normanok.gov)  
**City of Norman – Fire Chief**

Keith Humphrey - [Keith.humphrey@ci.norman.ok.us](mailto:Keith.humphrey@ci.norman.ok.us)  
**City of Norman – Police Chief**

David Grizzle - [David.Grizzle@normanok.gov](mailto:David.Grizzle@normanok.gov)  
**Emergency Management Coordinator – City of Norman**

Shawn O’Leary – [shawn.oleary@ci.norman.ok.us](mailto:shawn.oleary@ci.norman.ok.us)  
Director of Public Works – City of Norman

## Appendix A – Plan Organization – Contact List (continued)

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Gayland Kitch - [Gkitch@cityofmoore.com](mailto:Gkitch@cityofmoore.com)  
Emergency Manager - City of Moore

Joe Lester - [jlester@ccso-ok.us](mailto:jlester@ccso-ok.us)  
Cleveland County, Sheriff

Chris Klein - [Chris.klein@mntechnology.com](mailto:Chris.klein@mntechnology.com)  
Moore Norman Technology Center - Safety Director

Rhett Burnett - [rburnett@ccso-ok.us](mailto:rburnett@ccso-ok.us)  
Cleveland County Sheriff Office - Undersheriff

Kenneth Bentley - [kbentley@arcok.org](mailto:kbentley@arcok.org)  
American Red Cross – Emergency Services

Roger Brown - [rbrown@norman.k12.ok.us](mailto:rbrown@norman.k12.ok.us)  
Norman Public Schools – Ass’t Superintendent

Jim Martin - [jmartin@robinhill.k12.ok.us](mailto:jmartin@robinhill.k12.ok.us)  
Robin Hill Schools – Superintendent

Kay Bolles - [kbolles@litleaxe.k12.ok.us](mailto:kbolles@litleaxe.k12.ok.us)  
Little Axe Public Schools – Administrative Secretary

Shane Cohea - [Scohea@nrh-ok.com](mailto:Scohea@nrh-ok.com)  
Norman Regional Hospital - Manager

Angie Drury - [Angie@normanchamber.com](mailto:Angie@normanchamber.com)  
Norman Chamber of Commerce – Office Manager

Dawn McNutt - [dawn@nobleok.net](mailto:dawn@nobleok.net)  
Noble Chamber of Commerce – Executive Director

Elaine Lyons - [elainelyons@southokc.com](mailto:elainelyons@southokc.com)  
South Oklahoma City Chamber of Commerce – President/CEO

Keith Springstead - [spring305@msn.com](mailto:spring305@msn.com)  
City of Noble – Police Chief

Eva Dunn - [edunn@nobleps.com](mailto:edunn@nobleps.com)  
Noble Public Schools – Administration – Child Nutrition

Rod Cleveland - [rcleveland@okco14.org](mailto:rcleveland@okco14.org)  
Cleveland County Commissioner – District 1

George Skinner - [gskinner@okco14.org](mailto:gskinner@okco14.org)  
Cleveland County Commissioner – District 2

## Appendix A – Plan Organization – Contact List (continued)

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Rusty Sullivan - [rustycommish@yahoo.com](mailto:rustycommish@yahoo.com)  
Cleveland County Commissioner – District 3

David Van Nostrand [davidvan@hazardplans.com](mailto:davidvan@hazardplans.com)  
Hazard Mitigation Specialists, L.L.C., Consultant

Bill Penka – [bill.penka@oem.ok.gov](mailto:bill.penka@oem.ok.gov)  
OEM Hazard Mitigation Division –Hazard Mitigation Officer

Edward Cravens - [mcclain.em@gmail.com](mailto:mcclain.em@gmail.com)  
Emergency Manager – McClain County

Don Lynch - [DLynch@shawneeok.org](mailto:DLynch@shawneeok.org)  
Emergency Manager. Shawnee/Pottawatomie County

David Barnes - [DBarnes@oklahomacounty.org](mailto:DBarnes@oklahomacounty.org)  
Oklahoma County - Emergency Manager

Frank Barnes - [franklin.barnes@okc.gov](mailto:franklin.barnes@okc.gov)  
Oklahoma City - Emergency Manager

Denise Ellison - [dellison@okco14.org](mailto:dellison@okco14.org)  
Cleveland County- Commissioner’s Office Manager

Cathy Canty - [cathyc@ccenviro.net](mailto:cathyc@ccenviro.net)  
Hitachi - LEPC Chairman and Environmental Dept.

- **Letters of Invitation**

Date: Wed, Aug 10, 2011 at 3:43 PM

Subject: Kickoff meeting for Cleveland County Multi-Jurisdictional Hazard Mitigation Plan Update

Attached is the notice for our kickoff meeting to update the Cleveland County Multi-jurisdictional Hazard Mitigation Plan. I hope you can attend or send a representative.

Thanks.

/S/ Dan E. Cary

Director of Safety and Emergency Management

The following notice was posted on the county's web site providing notice to all persons.



## CLEVELAND COUNTY

*The Heart of Oklahoma*

August 10, 2011

### Special Invitation to attend

RE: Cleveland County Multi-Hazard Mitigation Plan Update

The Cleveland County Commissioners and the Cleveland County Emergency Management Office want to join with the citizens of Cleveland County to update our Cleveland County Multi-Jurisdictional Natural Hazard Mitigation Plan. We have hired Hazard Mitigation Specialists, L.L.C. a consulting firm to help us get this comprehensive plan finished and approved successfully. It's now time to identify a team of dedicated local individuals to participate in updating this plan. We are inviting you and an alternate of your choosing to be a member of this very important team.

This plan provides a guide for the next five years for projects in our towns, cities, schools and the county that will reduce or eliminate the adverse effects of natural disasters on our citizens in Cleveland County. The individuals on this team will be the community experts who can provide critical local information to the success of this plan and the projects that will be developed. By completing the plan and having it approved by the Oklahoma Emergency Management and the Federal Emergency Management Agency, participating jurisdictions will be eligible for federal hazard mitigation funding to help complete our projects. Without it we are not eligible.

**This plan will include all of the cities & towns (incorporated and unincorporated) within Cleveland County, the public school districts, and Cleveland County.** It will be necessary to have 5-6 meetings over the next several months to accomplish this task. Our first meeting will be **August 17, 2011 from 10:00 AM to 12 noon at the Cleveland County Election Board Training Room, 641 E. Robinson St. Norman, OK.**

If you are willing to serve on this very vital team, please come to the meeting on the 17th. Thank you for considering this very important service to your community. Please **RSVP to this invitation by calling the Cleveland County Commissioners Office at 405-366-0200.** If you have any questions, please don't hesitate to call this office at 405-366-0249.

Sincerely,

A handwritten signature in cursive script that reads "Dan E. Cary".

, Director

Cleveland County Emergency Management

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405.366.0200 • 201 S. Jones Ave, Ste 260 • Norman, OK 73069

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From: Dan Cary [mailto:dcary1@okco14.org]  
Sent: Monday, August 29, 2011 11:43 AM  
To: Walt Allen; 'dprince@lexington.k12.ok.us'; 'Janson Idlett'; 'City Of Noble'; Gary Bonner (bonnernfd@sbcglobal.net); Marsha Blair (slaughterville@sbcglobal.net); 'Jimmy Blair'; 'Paul Long'; 'brush2dr@aol.com'; 'aschneider@littleaxefd.com'; 'steve.lewis@normanok.gov'; 'James Fullingim'; 'Keith.humphrey@ci.norman.ok.us'; 'David Grizzle'; 'shawn.oleary@ci.norman.ok.us'; 'Gayland Kitch'; 'jlester@clevelandcountysheriff.org'; 'ccklein@mntechnology.com'; 'Rhett Burnett'; 'Kenneth Bentley'; 'Roger Brown'; Jim Martin <jmartin@robinhill.k12.ok.us>; 'kbolles@litleaxe.k12.ok.us'; 'Scohea@nrh-ok.com'; 'Angie@normanchamber.com'; 'dawn@nobleok.net'; 'elainelyons@southokc.com'; 'spring305@msn.com'; 'edunn@nobleps.com'; 'Mikem@ou.edu'; 'deana\_standridge2005@yahoo.com'  
Cc: 'Rod Cleveland'; 'gskinner@okco14.org'; 'rustycommish@yahoo.com'; 'Dave Batton'; 'David VanNostrand'; Cravens, Edward; 'Don Lynch'; 'David'; 'franklin.barnes@okc.gov'; 'dellison@okco14.org'; 'cathyc@ccenviro.net'; Peggy Laizure [Peggy@mooreamerican.com] (Peggy@mooreamerican.com); Lyle Milby (Lyle.Milby@NormanOK.gov)  
Subject: 2nd meeting for the Cleveland County Multi-Jurisdictional Hazard Mitigation Plan Update.

The 2nd meeting for the Cleveland County Multi-jurisdictional Hazard Mitigation Plan update will be held at the Cleveland County Election Board Training Room on Wednesday, August 31, 2011 from 10am to Noon. At this meeting we will be identifying the Critical Facilities throughout each jurisdiction. The consultant will also be covering those Hazard Mitigation Projects which have been included in other jurisdictional plans. That information will be useful in our selection of projects. If you have projects you want to include for your jurisdiction, this is the time to present them.

Just to refresh: the following jurisdictions and groups are included in the plan:

Cleveland County  
City of Norman  
City of Moore  
City of Noble  
City of Lexington  
Town of Slaughterville  
Norman Public Schools  
Moore Public Schools  
Noble Public Schools  
Lexington Public Schools  
Little Axe Public Schools  
Robin Hill School  
Moore/Norman Technology Center

NOTE: The University of Oklahoma while a part of the state plan can be included in the plan due to its close interaction with the jurisdictions in the county.

Other groups are asked to attend also, such as The Red Cross, etc.

Your agency's representation at the meeting is needed. Please attend or send a representative.

If you have any questions, please contact me.

Dan E. Cary

Director of Safety and Emergency Management  
(405) 366-0249 - Office  
(405) 366-0620 - Fax

\*\*\*\*\*

Meeting for the Cleveland County Multi-Jurisdictional Hazard Mitigation Plan Update.

Dan Cary dcary1@okco14.org  
9/12/11

To: Walt, dprince, ohpidlett, deana\_standrid., City, Gary, spring305, Marsha, Jimmy, Paul, steve.lewis, James, Keith.humphrey, David, shawn.oleary, Gayland, jlester, rburnett, cstephens, gbird, seddy, twilliams, Roger, edunn, elainelyons

Good afternoon, this is a reminder about the meeting tomorrow regarding the Update of the county's Multi-Jurisdictional Hazard Mitigation Plan.

The meeting will be held at 1:30pm, at the training room of the Cleveland County Election Board., 641 E. Robinson, Norman. It is important that your agency is represented during these meeting. You are encouraged to send someone from your agency if you cannot attend. We are working on mitigation projects that each agency would like to see included in the plan. If you have any questions please contact me, either by phone or email.

Thanks.

/S/ Dan E. Cary

Director of Safety and Emergency Management  
(405) 366-0249 - Office  
(405) 366-0620 - Fax

\*\*\*\*\*

Meeting for the Cleveland County Multi-Jurisdictional Hazard Mitigation Plan Update.

Dan Cary dcary1@okco14.org  
9/27/11

to Walt, dprince, ohpidlett, deana\_standrid., City, Gary, spring305, Marsha, Jimmy, Paul, steve.lewis, keith.humphrey, David, shawn.oleary, Gayland, jlester, rburnett, cstephens, gbird, seddy, Roger, edunn, elainelyons, aschneider, Amy

Good afternoon, this is a reminder about the meeting tomorrow regarding the Update of the county's Multi-Jurisdictional Hazard Mitigation Plan.

The meeting will be held at 10:, at the training room of the Cleveland County Election Board., 641 E. Robinson, Norman. It is important that your agency is represented during these meeting. You are encouraged to send someone from your agency if you cannot attend. We are working on mitigation projects that each agency would like to see included in the plan. If you have any questions please contact me, either by phone or email. Thanks.

Again the meeting will be held at 10:00 AM on Wednesday 9-28-2011.

Director of Safety and Emergency Management

/S/ Dan Cary



\*\*\*\*\*

From: Dan Cary [mailto:dcary1@okco14.org]  
Sent: Monday, November 07, 2011 11:36 AM  
To: 'dprince@lexington.k12.ok.us'; 'Gary Bonner'  
Cc: David VanNostrand (davidvan@hazardplans.com); Gayland Kitch (Gkitch@cityofmoore.com); Dan Cary (dancary@sbcglobal.net)

Subject: Meeting with schools re: hazard mitigation plan

Hi guys. I have set up a meeting with the schools that still need to meet with the consultants on the mitigation plan. The meeting will be held at 10:00 am, Thursday, 11/10/2011 in the Moore public school administration building, 1500 SE 4th Street, Moore. Mr. Brad Fernberg will meet us there and has agreed to have a room available for us to use.

The schools that are needing to come to the meeting are: Moore Public Schools, Lexington Public Schools, and Noble Public Schools.

We will focusing on mitigation projects that are related to education facilities.

Gary, will you be sure that someone from Noble schools attend?

Dan E. Cary

Director of Safety and Emergency Management

(405) 366-0249 - Office

(405) 366-0620 - Fax

---

**TO:** David VanNostrand  
Hazardous Mitigation Specialists

**FROM:** Dan Cary  
Cleveland County Emergency Management Director

**DATE:** May 16, 2012

**SUBJECT:** Town of Etowah- Cleveland County Multi-jurisdictional Hazard Mitigation  
Plan Participant

On November 29, 2011, I contacted Mrs. Joyce Green, Town Clerk and Treasurer of the Town of Etowah regarding the town's participation in the Cleveland County Multi-Jurisdictional Hazard Mitigation Plan. We discussed the plan and how the plan could benefit the Town of Etowah. Even though Etowah is a small community, its residents would be able to receive the same benefits as the larger neighbors. Etowah is regularly exposed to wildfires, tornados, and other types of disasters. If affected, Etowah would be able to benefit from the local, state, and federal assistance in recovering from the disaster. Etowah might want to develop mitigation activities to remove or lessen the effects of such disasters.

Mrs. Green was receptive to having the town trustees consider the plan by placing it on the agenda for their next meeting, which is set for December 4, 2011.

I sent the information for the agenda and other information explaining the plan.

The town trustees voted to participate in the plan.

I talked to her on December 14, 2011 about the meeting and how it went. She related the events of the meeting and that the trustees had approved the participation in the plan. I requested that she send me the signed agreement and the minutes of the meeting when she got them completed. She agreed to my request.

I received the documents and reviewed them. They were complete.

I later contacted Mrs. Green, regarding the population of Etowah after the 2010 Census. We agreed that the population is now 92. That figure is down slightly from the 2000 Census.

Mrs. Green has been very helpful in this process. She is who I depend on for Etowah updates.

- Meeting Agendas/Minutes

## Agenda

### Introductory Meeting - August 17, 2011 Cleveland County Hazard Mitigation Planning Team

10:00

#### WELCOME AND INTRODUCTIONS

Dan Cary,  
Cleveland Co. EM

#### Why a Consultant?

David Van Nostrand  
Hazard Mitigation  
Specialists

#### Who is involved?

#### Why are you here?

#### What is a Natural Hazard Mitigation Plan?

#### THE PLANNING PROCESS

- ✓ Organize Resources
- ✓ Assess the Risks
- ✓ Develop the Mitigation Plan
- ✓ Implement and Monitor progress

#### HAZARD ASSESSMENT

#### GOALS

#### PROJECTS

11:00

#### 2006 Plan Project Update

Steve Somerlott  
Hazard Mitigation  
Specialists

## Agenda

### **CRITICAL FACILITIES/PROJECTS**

**Meeting - August 31, 2011**

Cleveland County Hazard Mitigation Planning Team

**10:00**

**WELCOME**

Dan Cary,  
Cleveland Co. EM

**PROJECTS**

**Dan Biby/Steve Somerlott**  
Hazard Mitigation  
Specialists

**What are some possible projects?**

**Naming your projects**

**11:00**

**CRITICAL FACILITY IDENTIFICATION**

**Judy Soos**  
Hazard Mitigation  
Specialists

**Why do we need to identify Critical Facilities?**

**What constitutes a Critical Facility?**

**Assignment Critical Facilities**

**NEXT MEETING: September 13, 2011 – 1:00 P.M. – Cleveland County  
Election Board – Upstairs  
Meeting Room**

**NOTE:** Printed agendas were not provided after the August 31 meeting since the only program material dealt with Action Project identification.

## Meeting Minutes

| <b>NAME OF ORGANIZATION:</b>  | Cleveland County Hazard Mitigation Planning Team                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                        |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>PURPOSE OF MEETING:</b>    | Introduction to Hazard Mitigation Plan                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                        |
| <b>DATE/TIME:</b>             | August 17, 2011 - 10:00 A.M.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                        |
| <b>LOCATION:</b>              | Cleveland County Election Board                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                        |
| <b>CHAIRPERSON:</b>           | Dan Cary, Cleveland County Emergency Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                        |
| Topics                        | Meeting Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Presenters                                             |
| Introduction                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Dan Cary                                               |
| Program –<br>Intro to Hazards | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan. Discussed four phases and ten step process that will be used and possible Goals. Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm. | David Van Nostrand<br>Hazard Mitigation<br>Specialists |
| Project Review                | Reviewed status of projects from 2006 HM Plan                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Steve Somerlott<br>Hazard Mitigation<br>Specialists    |
| Meeting Adjourned             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Dan Cary                                               |

## Meeting Minutes

| <b>NAME OF ORGANIZATION:</b>    | Cleveland County Hazard Mitigation Planning Team                                                                                                                                                                                                                                                                         |                                               |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| <b>PURPOSE OF MEETING:</b>      | Review of August 17 meeting/Critical Facilities/Projects cont.                                                                                                                                                                                                                                                           |                                               |
| <b>DATE/TIME:</b>               | August 31, 2011 - 10:00 A.M.                                                                                                                                                                                                                                                                                             |                                               |
| <b>LOCATION:</b>                | Cleveland County Election Board                                                                                                                                                                                                                                                                                          |                                               |
| <b>CHAIRPERSON:</b>             | Dan Cary, Cleveland County Emergency Manager                                                                                                                                                                                                                                                                             |                                               |
| Topics                          | Meeting Content                                                                                                                                                                                                                                                                                                          | Participants                                  |
| Review                          | Review of previous meeting hazards; goals etc.                                                                                                                                                                                                                                                                           | David Van Nostrand                            |
| Program:<br>Critical Facilities | Discussion of definition of critical facilities based on Federal Regulations. Asked participants for information on what critical facilities they could identify in Cleveland County. Also gave them forms to fill out before the next meeting on other critical facilities they might think of before the next meeting. | Judy Soos<br>Hazard Mitigation<br>Specialists |
| Projects                        | Introduction to possible action projects                                                                                                                                                                                                                                                                                 | Dan Biby<br>Hazard Mitigation<br>Specialists  |
| Meeting Adjourned               |                                                                                                                                                                                                                                                                                                                          | Dan Cary                                      |

## Meeting Minutes

|                              |                                                  |
|------------------------------|--------------------------------------------------|
| <b>NAME OF ORGANIZATION:</b> | Cleveland County Hazard Mitigation Planning Team |
| <b>PURPOSE OF MEETING:</b>   | Project Identification- Possible Projects        |
| <b>DATE/TIME:</b>            | September 13, 2011 - 1:00 P.M.                   |
| <b>LOCATION:</b>             | Cleveland County Election Board                  |
| <b>CHAIRPERSON:</b>          | Dan Cary, Cleveland County Emergency Manager     |

| Topics            | Meeting Content                                                                                                                                                                                            | Participants                                                 |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Action Projects   | Began introduction to possible projects to be included in the new plan. A number of suggested projects were discussed and participants were given the opportunity to discuss projects they had considered. | Steve Somerlott & Dan Biby<br>Hazard Mitigation Specialists. |
| Meeting Adjourned |                                                                                                                                                                                                            | Dan Cary                                                     |

## Meeting Minutes

|                              |                                                  |
|------------------------------|--------------------------------------------------|
| <b>NAME OF ORGANIZATION:</b> | Cleveland County Hazard Mitigation Planning Team |
| <b>PURPOSE OF MEETING:</b>   | Projects Identification Final and Prioritization |
| <b>DATE/TIME:</b>            | September 28, 2011 - 10:00 A.M.                  |
| <b>LOCATION:</b>             | Cleveland County Election Board                  |
| <b>CHAIRPERSON:</b>          | Dan Cary, Cleveland County Emergency Manager     |

| Topics            | Meeting Content                                                                                                                                                                          | Presenters                                                              |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Prioritization    | Reviewed projects determined at previous meetings. Provided participants with evaluation sheet based on S.T.A.P.L.E.E. method of prioritizing.                                           | Steve Somerlott / Dan Biby<br>Hazard Mitigation Specialists             |
| Plan Maintenance  | Discussed process of plan implementation, maintenance and review procedures. Announced plan for additional meeting after FEMA approval to discuss adoption process and its importance. . | Steve Somerlott;<br>David Van Nostrand<br>Hazard Mitigation Specialists |
| Meeting Adjourned |                                                                                                                                                                                          | Dan Cary                                                                |

Makeup meeting was held for those participants that had been unable to make the required number of meetings.

## Meeting Minutes

|                              |                                                  |
|------------------------------|--------------------------------------------------|
| <b>NAME OF ORGANIZATION:</b> | Cleveland County Hazard Mitigation Planning Team |
| <b>PURPOSE OF MEETING:</b>   | Hazard Mitigation Plan Make-up meeting           |
| <b>DATE/TIME:</b>            | November 10, 2011 - 10:00 A.M.                   |
| <b>LOCATION:</b>             | Moore Administration Building – Moore, OK        |
| <b>CHAIRPERSON:</b>          | Dan Cary, Cleveland County Emergency Manager     |

| Topics               | Meeting Content                                                                                                                                                                       | Participants                                                  |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| S.T.A.P.L.E.E Review | Reviewed Hazards; goals and action projects determined at previous meetings. Participants were then encouraged to offer any potential projects they had in mind. or to ask questions. | Dan Biby; David Van Nostrand<br>Hazard Mitigation Specialists |
| Meeting Adjourned    |                                                                                                                                                                                       | Dan Cary                                                      |

MINUTES OF THE REGULAR MEETING  
HELD DECEMBER 4, 2011 4:00 P. M.  
TOWN OF ETOWAH, OKLAHOMA

1. Call to order  
James Bachman called the regular meeting of the Etowah Town Trustees to order at 4:05 p. m. on December 4, 2011. The meeting was held at the home of Sam Samples, one block east of 180<sup>th</sup> Street, on the south side of Maguire Road, Etowah, OK, pursuant to the State Open Meeting Law with due and proper notice provided. Notice of the agenda was posted on December 1, 2011.
2. Roll call, declaration of quorum being present: Jim Bachman, present; James Ferguson, present; LeMual Cavin, present; Janet Green, present.  
This meeting also attended by Dale Killingsworth
3. Consideration and action of the Consent Agenda
  - a. Approval of Claims: None
  - b. Approval of Financial Reports: None
  - c. Approval of November 6, 2011 Regular meeting minutes  
Motion by Bachman, 2<sup>nd</sup> by Ferguson            3 ayes/0 nays
4. Hearing of delegations and citizens
  - a. All paperwork due to Pottawatomie Telephone Company has been completed and copies will be distributed this month to Matt Overland of POTELCO as well as filed with the county clerk's office
  - b. The new Regular Meeting Schedule for 2012 has been completed in accordance with Resolution 2011-2 for the third Sunday of each month. Copy is available at the clerk's office and will also be submitted to the county clerk's office this month.
  - c. Current banking statements have been submitted by the Mayor to the town clerk.
  - d. Mr. Killingsworth presents the idea that if businesses are opened within the town limits, it would be appropriate to vote in a town sales tax to increase revenues since state tax collection procedures would be in place. It is noted that currently, the sales tax would mostly apply to propane sales already occurring within the town boundaries.
  - e. The clerk advises the Board that she has been contacted by Dan Cary of the Safety and Emergency Management Director with Cleveland County. He explains that the county is in the process of forming a local hazard mitigation



plan and that Etowah is eligible to be included in this plan. Mrs. Green presents a form emailed to her by Mr. Cary for consideration in this matter.

5. Remarks and inquiries by board members
  - a. Annexation discussion deferred until a later date.
  - b. Election procedures will be reviewed in December. There is a possible Special Meeting if the deadlines for filing candidacy occur before the January Regular Meeting.
  - c. The Board discusses the advantages of being included in the county Hazard Mitigation program. No disadvantages are apparent in this matter. No particular questions are presented, but all members agree to make time for meetings as necessary. All council members are interested in further interaction with officials to gather additional information about storm sirens and shelters as well as other available options to protect/serve the rural community. A motion to participate is made by Mayor Bachman, 2<sup>nd</sup> by Councilman Cavin. The vote is 3 ayes/0 nays. Mrs. Green will present the required paperwork to Mr. Cary's office.
  
6. Adjourn 4:30 p.m. Motion by Bachman, 2<sup>nd</sup> by Cavin 3 ayes/0 nays

James Bachman, Mayor

Janet Green, Town Clerk/Treasurer

## Appendix A – Plan Organization – Intent to participate

As a part of the process to apply for the Hazard Mitigation Grant, each participating entity submitted a Letter of Intent to Participate in the planning process. A sample is shown here.

### ACKNOWLEDGEMENT OF INTENT TO PARTICIPATE IN LOCAL HAZARD MITIGATION PLAN

FROM:

Town of Etowah

TO:

Oklahoma Emergency Management  
Attn: Mr. Bill Penka, State Hazard Mitigation Officer  
P O Box 53365  
Oklahoma City, OK 73152



This will confirm that the jurisdiction shown above has **agreed** to participate in the planning project to create a **Cleveland County** Hazard Mitigation Plan. We request that our agency be named as a participant in that multi-jurisdictional hazard mitigation plan.



This will confirm that the jurisdiction shown above has chosen **NOT** to participate in the planning project to create a **Cleveland County** Hazard Mitigation Plan. We acknowledge that our agency be **NOT BE** named as a participant in that multi-jurisdictional hazard mitigation plan.



COMMENTS:



BY:

Janet Green  
(Printed name)

TITLE:





Town Clerk/Treasurer

DATE:

12-4-2011

- Meeting Publicity

|                                                                                   |                                                                                   |                                                                                                                                                                  |                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | <p><b>Shayne Lester, CFP®</b><br/>CERTIFIED FINANCIAL PLANNER™</p> <p>I offer a no cost, initial consultation. Please contact me to schedule an appointment.</p> | <p>Is pleased to announce his affiliation with</p>  <p>615 24th Ave. S.W., Suite B., Norman, OK 73069<br/>405-701-5888 • slester@unitedplanners.com</p> |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Homepage</li> <li>Subscribe!</li> <li>Subscriber Services</li> <li>Local News</li> <li>Local Beats</li> <li>State/Region</li> <li>Nation/World</li> <li>Sports</li> <li>Community Living</li> <li>Opinion</li> <li>Obituaries</li> <li>Classifieds</li> <li>Norman Homes</li> <li>Special Sections</li> <li>Norman magazine</li> <li>blinc</li> <li>Contact us</li> </ul> | <p><b>Local news</b> <input type="text"/> <input type="button" value="Go"/></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p><b>91°</b> H: 109° L: 82° </p> |
|                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>August 30, 2011</p> <h2>Emergency staff to learn how to ID critical facilities</h2> <p><b>Transcript Staff</b><br/>The Norman Transcript</p> <p>NORMAN — The Cleveland County Multi-jurisdictional Hazard Mitigation Plan update meeting on Wednesday will focus on identifying critical facilities throughout each jurisdiction.</p> <p>Information presented to county and municipal emergency responders, staff and administrators also will cover hazard mitigation projects that have been included in other jurisdictional plans.</p> <p>That information will be useful in the selection and prioritization of projects.</p> <p>The following jurisdictions and groups participating in the plan include Cleveland County as well as local cities and the school districts of Norman, Moore, Noble, Lexington, Slaughterville, Lexington Public Schools, Little Axe Public Schools, Robin Hill School and Moore/Norman Technology Center.</p> <p>The University of Oklahoma, while a part of the state plan, also can be included in the plan, due to its close interaction with the jurisdictions in the county.</p> <p>Other groups such as the Red Cross are invited to attend.</p> |                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                  | <p><b>Discussion</b></p> <p> Add a comment...</p> <p><input type="button" value="Comment"/></p> <p>Facebook social plugin</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                  |

| <b>PARTICIPANTS AND CONTRIBUTIONS</b> |                      |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------|----------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>                           | <b>JURISDICTION</b>  | <b>POSITION</b>         | <b>CONTRIBUTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Andrew Krittler                       | Norman Transcript    | Reporter                | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> |
| Angelo Lombardo                       | Norman, City         | Traffic Engineer        | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> |
| Brad Fernberg                         | Moore Public Schools | Administration          | <p>Reviewed hazards, goals and action projects determined at previous meetings.</p> <p>Reviewed project selections.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Cathy Canty                           | Hitachi Corp         | Cleveland Co LEPC / CCE | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> |

| <b>PARTICIPANTS AND CONTRIBUTIONS</b> |                                |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------|--------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>                           | <b>JURISDICTION</b>            | <b>POSITION</b>          | <b>CONTRIBUTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Chris Klein                           | Moore-Norman Technology Center | Safety Officer           | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p> |
| Chris Mattingly                       | Norman, City                   | Utilities Superintendent | <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Dan Biby                              | Hazard Mitigation Specialists  | Planner                  | <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p> <p>Reviewed projects determined at previous meetings.</p> <p>Discussed project evaluation based on S.T.A.P.L.E.E. method of prioritizing.</p> <p>Discussed process of plan implementation, maintenance and review procedures.</p> <p>Discussed plan for additional meeting after FEMA approval to discuss adoption process and its importance.</p> <p>Reviewed hazards, goals and action projects determined at previous meetings.</p> <p>Reviewed project selections.</p>                                                                                                     |
| Dan Cary-CCHMPT Chairman              | Cleveland County               | Emergency Manager        | <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| PARTICIPANTS AND CONTRIBUTIONS |                           |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|---------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NAME                           | JURISDICTION              | POSITION                         | CONTRIBUTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                |                           |                                  | <p>based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p> <p>Discussed and suggested possible projects to be included in the new plan.</p> <p>Reviewed hazards, goals and action projects determined at previous meetings.</p> <p>Reviewed project selections.</p> <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> |
| Darrell Smith                  | Little Axe Public Schools | Maintenance Director             | <p>Discussed and suggested possible projects to be included in the new plan.</p> <p>Reviewed projects determined at previous meetings.</p> <p>Discussed project evaluation based on S.T.A.P.L.E.E. method of prioritizing.</p> <p>Discussed process of plan implementation, maintenance and review procedures.</p> <p>Discussed plan for additional meeting after FEMA approval to discuss adoption process and its importance.</p> <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p>                                                                                                                                                                                                                                 |
| David Grizzle                  | Norman, City              | Emergency Management Coordinator | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| PARTICIPANTS AND CONTRIBUTIONS |                  |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------|------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NAME                           | JURISDICTION     | POSITION             | CONTRIBUTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                |                  |                      | <p>Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> <p>Reviewed projects determined at previous meetings.</p> <p>Discussed project evaluation based on S.T.A.P.L.E.E. method of prioritizing.</p> <p>Discussed process of plan implementation, maintenance and review procedures.</p> <p>Discussed plan for additional meeting after FEMA approval to discuss adoption process and its importance.</p> <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p> <p>Discussed and suggested possible projects to be included in the new plan.</p> |
| David Hager                    | Norman, City     | Utilities Supervisor | <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| David Woods                    | Norman, City     | Oil & Gas Inspector  | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p>                                                                                                                                                                                                                                                                                                                                                                      |
| Denise Ellison                 | Cleveland County | Office Mgr           | <p>Reviewed of previous meeting determination of hazards and goals.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| <b>PARTICIPANTS AND CONTRIBUTIONS</b> |                      |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <b>NAME</b>                           | <b>JURISDICTION</b>  | <b>POSITION</b>   | <b>CONTRIBUTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                       |                      |                   | Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.<br>Introduced to possible action projects                                                                                                                                                                                                                                                                                                                                                                       |
| Dennie Morgan                         | Moore Public Schools | Administration    | Reviewed hazards, goals and action projects determined at previous meetings. Reviewed project selections.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Denny Prince                          | Lexington Schools    | Superintendent    | Reviewed projects determined at previous meetings.<br>Discussed project evaluation based on S.T.A.P.L.E.E. method of prioritizing.<br>Discussed process of plan implementation, maintenance and review procedures.<br>Discussed plan for additional meeting after FEMA approval to discuss adoption process and its importance.                                                                                                                                                                                                                             |
| Eva Dunn                              | Noble Public Schools | Administration    | Reviewed hazards, goals and action projects determined at previous meetings. Reviewed project selections.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Gary Bird                             | Moore, City          | Deputy Fire Chief | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.<br>Discussed four phases and ten step process that will be used and possible Goals.<br>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.<br>Reviewed status of projects from 2006 HM Plan |
| Gary Bonner                           | Noble, City          | Fire Chief        | Reviewed projects determined at previous meetings.<br>Discussed project evaluation based on S.T.A.P.L.E.E. method of prioritizing.<br>Discussed process of plan implementation, maintenance and review procedures.<br>Discussed plan for additional meeting after FEMA approval to discuss adoption process and its importance.<br>Discussed and suggested possible projects to be included in the new plan.                                                                                                                                                |
| Gary Sullens                          | Hitachi Corp         | Facility Mgr      | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.<br>Discussed four phases and ten step process that will be used and possible Goals.                                                                                                                                                                                                                                                                                                                                                      |



| PARTICIPANTS AND CONTRIBUTIONS |                  |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| NAME                           | JURISDICTION     | POSITION      | CONTRIBUTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                |                  |               | <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Gayland Kitch                  | Moore, City      | Emergency Mgr | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> <p>Reviewed hazards, goals and action projects determined at previous meetings.</p> <p>Reviewed project selections.</p> <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p> <p>Discussed and suggested possible projects to be included in the new plan.</p> |
| George Skinner                 | Cleveland County | Commissioner  | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| <b>PARTICIPANTS AND CONTRIBUTIONS</b> |                     |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <b>NAME</b>                           | <b>JURISDICTION</b> | <b>POSITION</b>            | <b>CONTRIBUTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                       |                     |                            | <p>Reviewed status of projects from 2006 HM Plan</p> <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p>                                                                                                                                                                                                                                                                                                |
| Greg Hall                             | Norman, City        | Superintendent             | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> |
| Harry Grider                          | Lexington Schools   | Administration             | <p>Reviewed hazards, goals and action projects determined at previous meetings.</p> <p>Reviewed project selections.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| James Fullingim                       | Norman, City        | Emergency Mgr / Fire Chief | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> |
| Jansen Idlett                         | Lexington, City     | Fire Chief                 | <p>Reviewed projects determined at previous meetings.</p> <p>Discussed project evaluation based on S.T.A.P.L.E.E. method of prioritizing.</p> <p>Discussed process of plan implementation, maintenance and review procedures.</p> <p>Discussed plan for additional meeting after FEMA approval to discuss adoption process and its importance.</p>                                                                                                                                                                                                                             |

| <b>PARTICIPANTS AND CONTRIBUTIONS</b> |                     |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <b>NAME</b>                           | <b>JURISDICTION</b> | <b>POSITION</b>    | <b>CONTRIBUTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Jay T Boynton                         | Boynton & Williams  | Architect          | Reviewed of previous meeting determination of hazards and goals. Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County. Introduced to possible action projects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Jeff Wilson                           | Norman, City        | Code Compliance EM | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan. Discussed four phases and ten step process that will be used and possible Goals. Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm. Reviewed status of projects from 2006 HM Plan                                                                                                                                                                                                                                                                                                                                                                                                  |
| Jim Martin                            | Robin Hill School   | Superintendent     | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan. Discussed four phases and ten step process that will be used and possible Goals. Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm. Reviewed status of projects from 2006 HM Plan Discussed and suggested possible projects to be included in the new plan. Reviewed projects determined at previous meetings. Discussed project evaluation based on S.T.A.P.L.E.E. method of prioritizing. Discussed process of plan implementation, maintenance and review procedures. Discussed plan for additional meeting after FEMA approval to discuss adoption process and its importance. |

| <b>PARTICIPANTS AND CONTRIBUTIONS</b> |                     |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| <b>NAME</b>                           | <b>JURISDICTION</b> | <b>POSITION</b>    | <b>CONTRIBUTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Jimmy Blair                           | Slaughterville      | Fire Dept          | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> <p>Discussed and suggested possible projects to be included in the new plan.</p> <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p> |
| Joy Hampton                           | Norman Transcript   | Reporter           | <p>Discussed and suggested possible projects to be included in the new plan.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Keith Springstead                     | Noble, City         | Police Chief       | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> <p>Discussed and suggested possible projects to be included in the new plan.</p>                                                                                                                                                                                                                                                                          |
| Kenneth Bentley                       | American Red Cross  | Emergency Services | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| PARTICIPANTS AND CONTRIBUTIONS |                      |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| NAME                           | JURISDICTION         | POSITION           | CONTRIBUTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                |                      |                    | determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.<br>Reviewed status of projects from 2006 HM Plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Linda Price                    | Norman, City         | Revitalization Mgr | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.<br>Discussed four phases and ten step process that will be used and possible Goals.<br>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.<br>Reviewed status of projects from 2006 HM Plan<br>Reviewed of previous meeting determination of hazards and goals.<br>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.<br>Introduced to possible action projects |
| Luke A Jones                   | Hazard Mitigation    |                    | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.<br>Discussed four phases and ten step process that will be used and possible Goals.<br>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.<br>Reviewed status of projects from 2006 HM Plan                                                                                                                                                                                                                                                              |
| Marsha Blair                   | Slaughterville, Town | Town Administrator | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.<br>Discussed four phases and ten step process that will be used and possible                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| <b>PARTICIPANTS AND CONTRIBUTIONS</b> |                                    |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| <b>NAME</b>                           | <b>JURISDICTION</b>                | <b>POSITION</b>           | <b>CONTRIBUTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                       |                                    |                           | <p>Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> <p>Discussed and suggested possible projects to be included in the new plan.</p> <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p> |
| Mary Heinline                         | Noble Public Schools               | Administration            | <p>Reviewed hazards, goals and action projects determined at previous meetings. Reviewed project selections.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Mike Bradford                         | Oklahoma Emergency Mgmt            | Plan Reviewer             | <p>Discussed and suggested possible projects to be included in the new plan.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Mike Montgomery                       | University of Oklahoma             | Director, Risk Management | <p>Reviewed of previous meeting determination of hazards and goals.</p> <p>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.</p> <p>Introduced to possible action projects</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Peggy Laizure                         | Moore American / Norman Transcript | Editor / Reporter         | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p>                                                                                                                                                       |
| Raylene Somerlott                     | Canadian County                    | Citizen                   | <p>Reviewed projects determined at previous meetings.</p> <p>Discussed project evaluation based on S.T.A.P.L.E.E. method of prioritizing.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

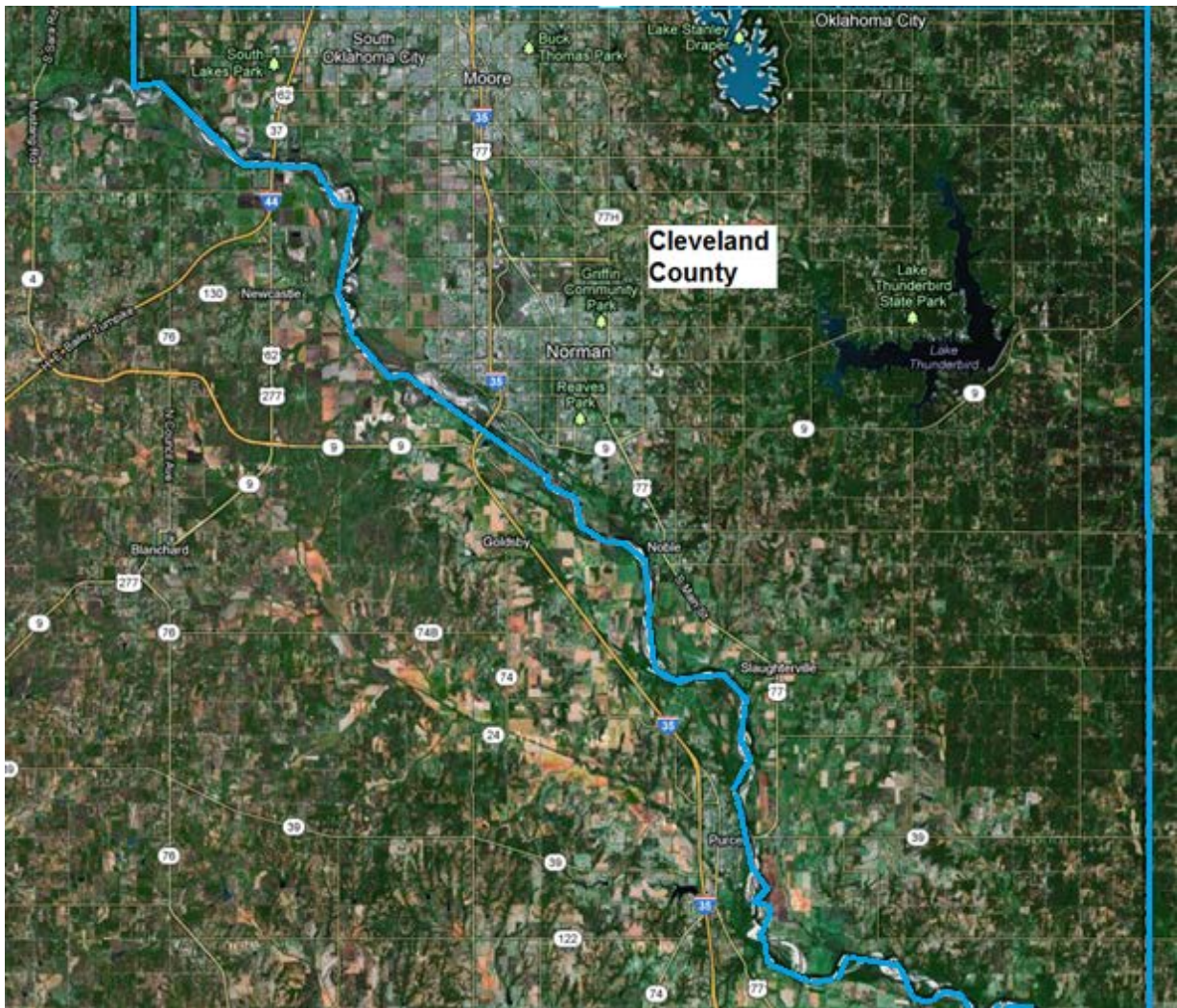
| <b>PARTICIPANTS AND CONTRIBUTIONS</b> |                       |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| <b>NAME</b>                           | <b>JURISDICTION</b>   | <b>POSITION</b>          | <b>CONTRIBUTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                       |                       |                          | Discussed process of plan implementation, maintenance and review procedures.<br>Discussed plan for additional meeting after FEMA approval to discuss adoption process and its importance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Rhett Burnett                         | Cleveland County      | Undersheriff             | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.<br>Discussed four phases and ten step process that will be used and possible Goals.<br>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.<br>Reviewed status of projects from 2006 HM Plan<br>Reviewed of previous meeting determination of hazards and goals.<br>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.<br>Introduced to possible action projects |
| Rod Cleveland                         | Cleveland County      | Commissioner             | Reviewed of previous meeting determination of hazards and goals.<br>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.<br>Introduced to possible action projects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Rodney Barrett                        | Cleveland County      | Health Dept, Logistics   | Discussed and suggested possible projects to be included in the new plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Roger Brown                           | Norman Public Schools | Assistant Superintendent | Reviewed of previous meeting determination of hazards and goals.<br>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.<br>Introduced to possible action projects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Rusty Sullivan                        | Cleveland County      | Commissioner             | Reviewed of previous meeting determination of hazards and goals.<br>Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County.<br>Introduced to possible action projects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Ryan Marlar                           | Moore, City           | Fire Dept, Major         | Discussed and suggested possible projects to be included in the new plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| <b>PARTICIPANTS AND CONTRIBUTIONS</b> |                          |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| <b>NAME</b>                           | <b>JURISDICTION</b>      | <b>POSITION</b>          | <b>CONTRIBUTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Scott Aynes                           | Norman, City             | Crew Chief               | Reviewed of previous meeting determination of hazards and goals. Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County. Introduced to possible action projects Discussed and suggested possible projects to be included in the new plan.                                                                                                                                                                                                                      |
| Shane Cohea                           | Norman Regional Hospital | Manager                  | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan. Discussed four phases and ten step process that will be used and possible Goals. Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm. Reviewed status of projects from 2006 HM Plan |
| Sharon Howard                         | Norman Public Schools    | Health Coordinator       | Discussed and suggested possible projects to be included in the new plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Shawn O'Leary                         | Norman, City             | Director of Public Works | Reviewed of previous meeting determination of hazards and goals. Discussed definition of critical facilities based on Federal Regulations. Discussed critical facilities identification in Cleveland County. Introduced to possible action projects                                                                                                                                                                                                                                                                                                |
| Steve Eddy                            | Moore, City              | City Manager             | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan. Discussed four phases and ten step process that will be used and possible Goals. Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm. Reviewed status of projects from 2006 HM Plan |
| Ted Belling                           | Moore, City              | Police Lt.               | Discussed the purpose and reasons for developing a Hazard Mitigation Plan and                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

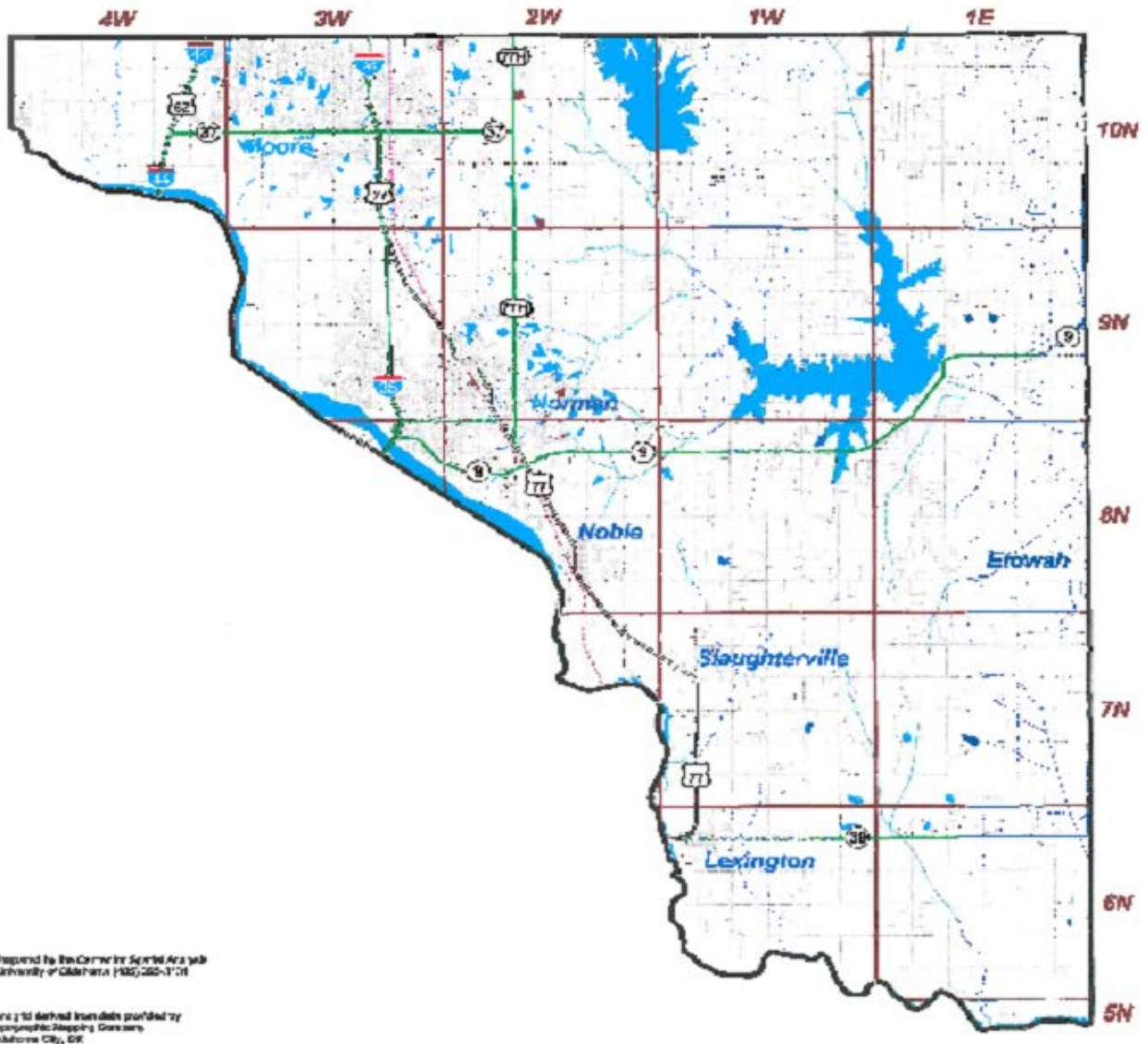


| <b>PARTICIPANTS AND CONTRIBUTIONS</b> |                           |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <b>NAME</b>                           | <b>JURISDICTION</b>       | <b>POSITION</b>                   | <b>CONTRIBUTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                       |                           |                                   | <p>the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p>                                                                               |
| Terry Ford                            | Noble Public Schools      | Officer                           | <p>Reviewed projects determined at previous meetings.</p> <p>Discussed project evaluation based on S.T.A.P.L.E.E. method of prioritizing.</p> <p>Discussed process of plan implementation, maintenance and review procedures.</p> <p>Discussed plan for additional meeting after FEMA approval to discuss adoption process and its importance.</p>                                                                                                                                                                                                                             |
| Todd Strickland                       | Moore, City               | Police Captain                    | <p>Discussed the purpose and reasons for developing a Hazard Mitigation Plan and the need to update the current plan.</p> <p>Discussed four phases and ten step process that will be used and possible Goals.</p> <p>Reviewed the 14 potential hazards that affect Oklahoma and asked participants to determine which hazards could affect Cleveland County. They selected 11 which included: Dam Failure; Drought; Earthquake; Extreme Heat; Flood; Hail; High Winds; Lightning; Tornado; Wildfire and Winter Storm.</p> <p>Reviewed status of projects from 2006 HM Plan</p> |
| Tony Smith                            | Little Axe Public Schools | Superintendent                    | Discussed and suggested possible projects to be included in the new plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Travis Ary                            | Lexington, City           | Assistant Fire Chief              | Discussed and suggested possible projects to be included in the new plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| William Francis                       | Cleveland County          | Health Dept, Logistics Facilities | Discussed and suggested possible projects to be included in the new plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| George Mauldin                        | Cleveland County          | Emergency Manager                 | Reviewed plan before re-submission to FEMA after he took over from Dan Cary who retired.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

# Cleveland County

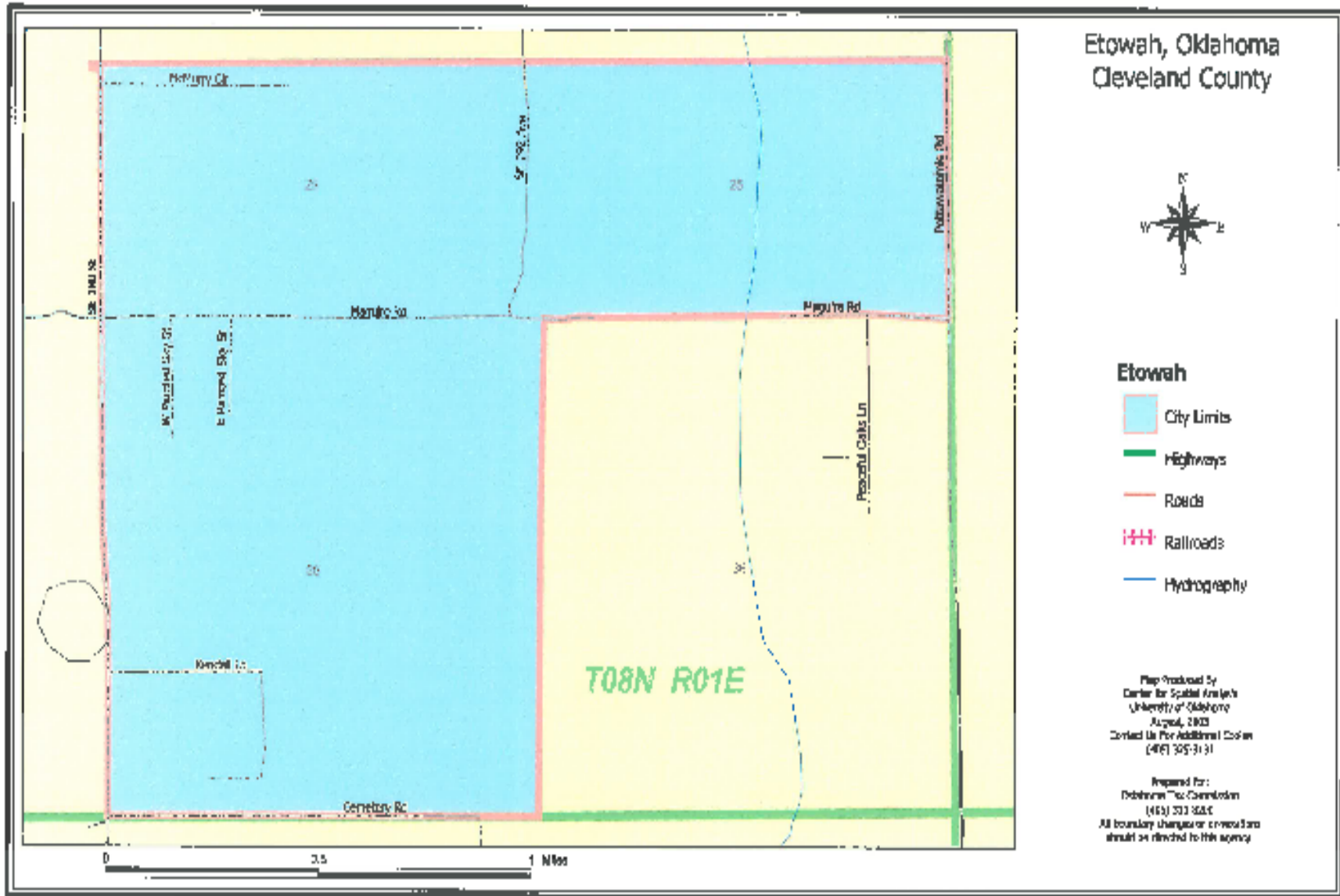


# Cleveland County

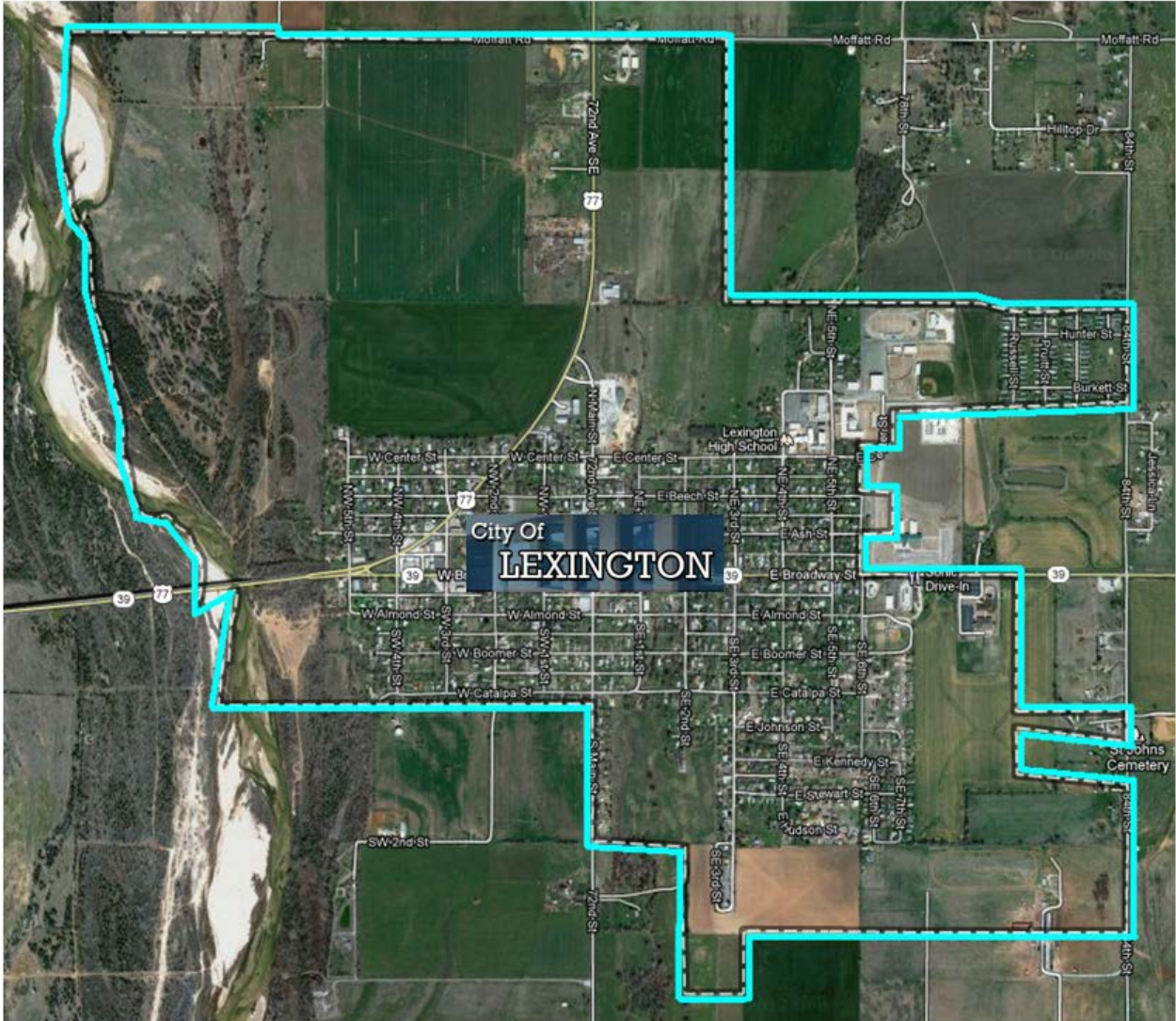


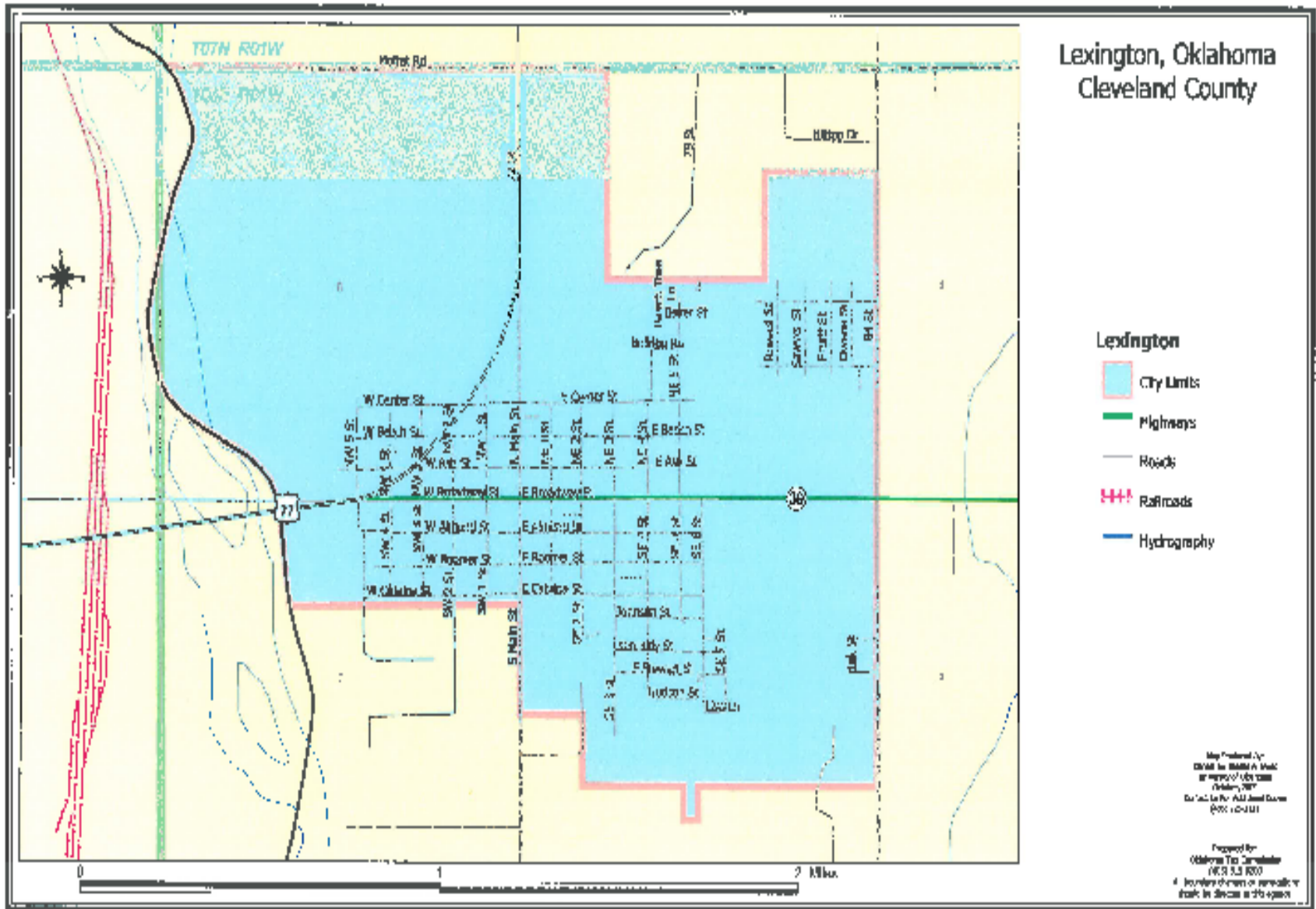
# Town of Etowah



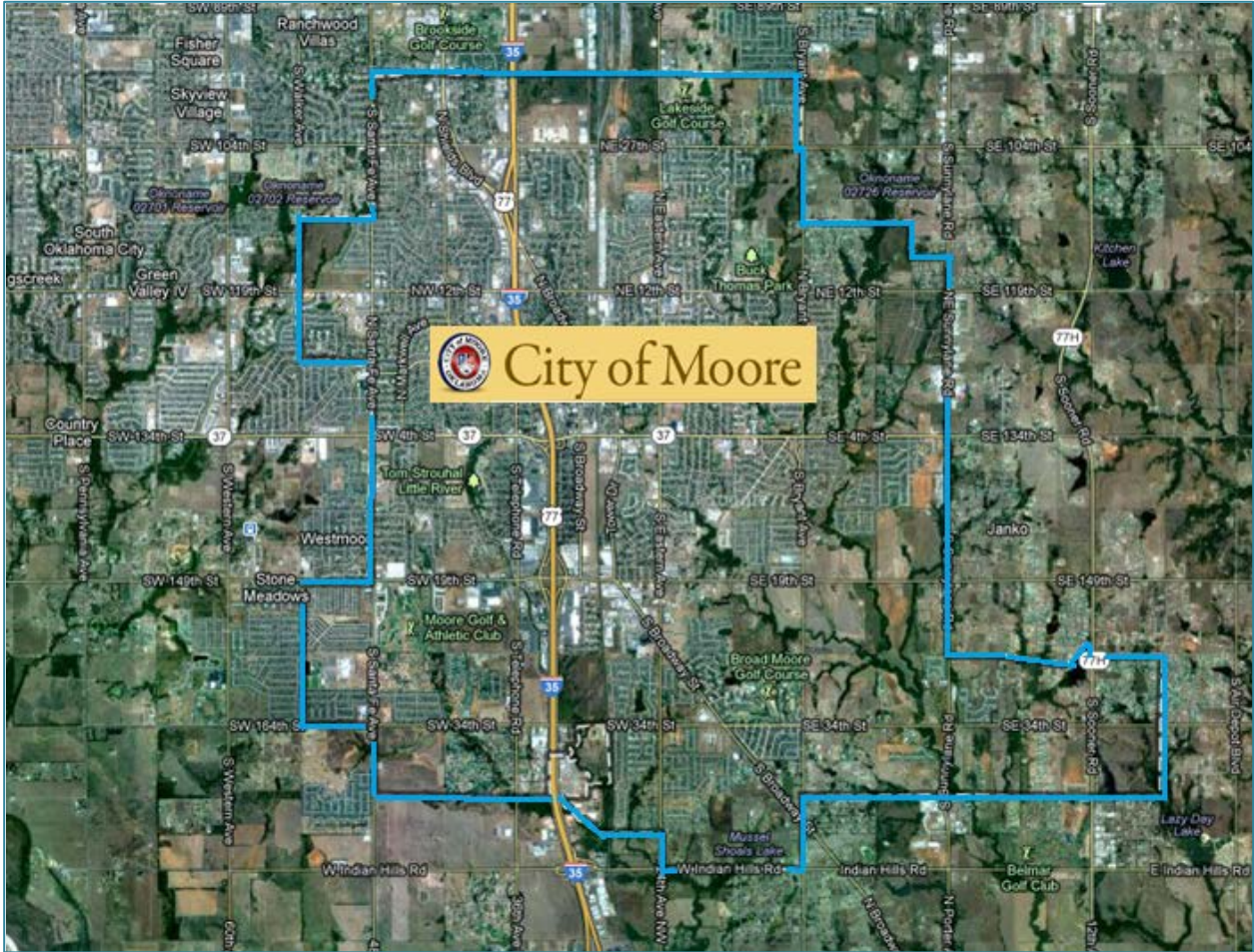


# City of Lexington

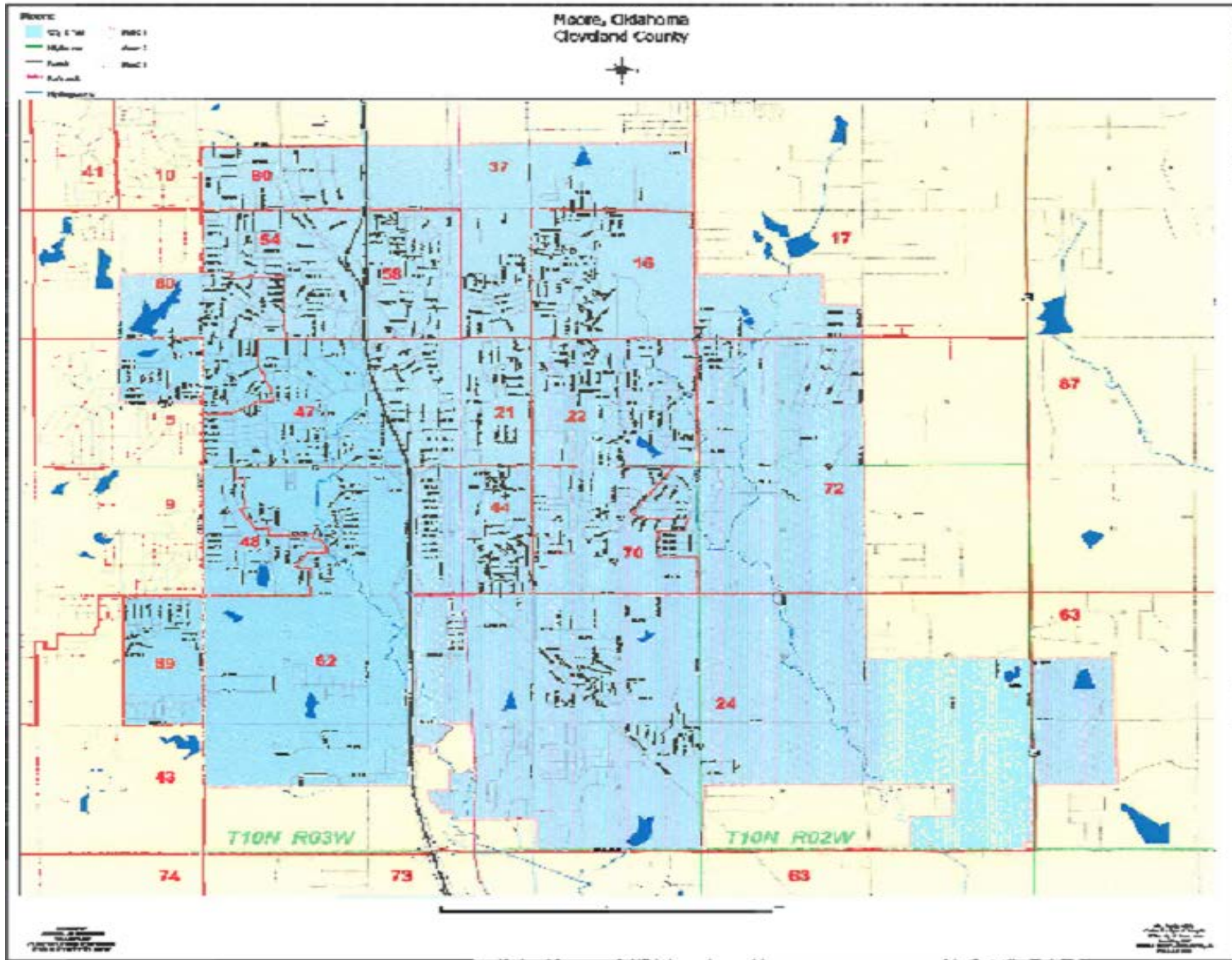




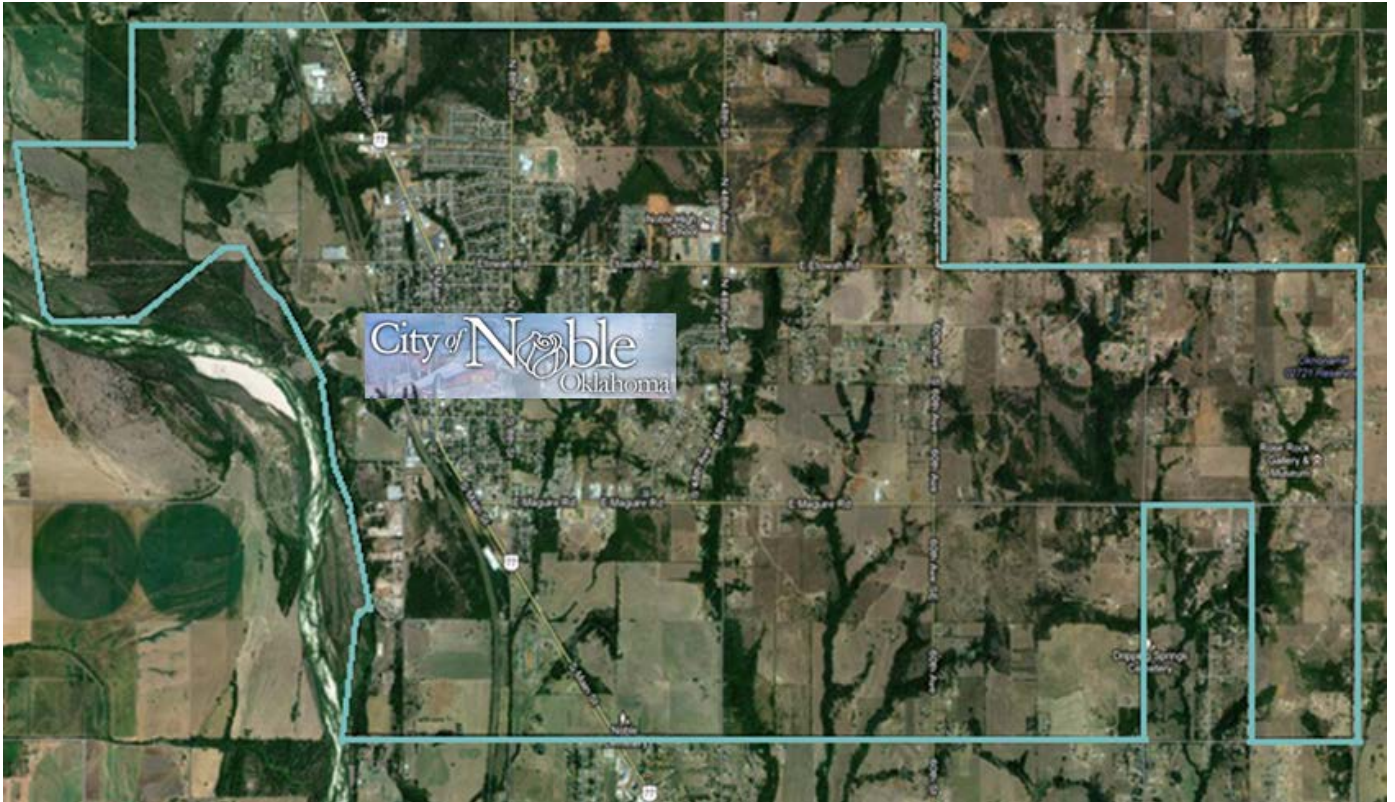
# City of Moore



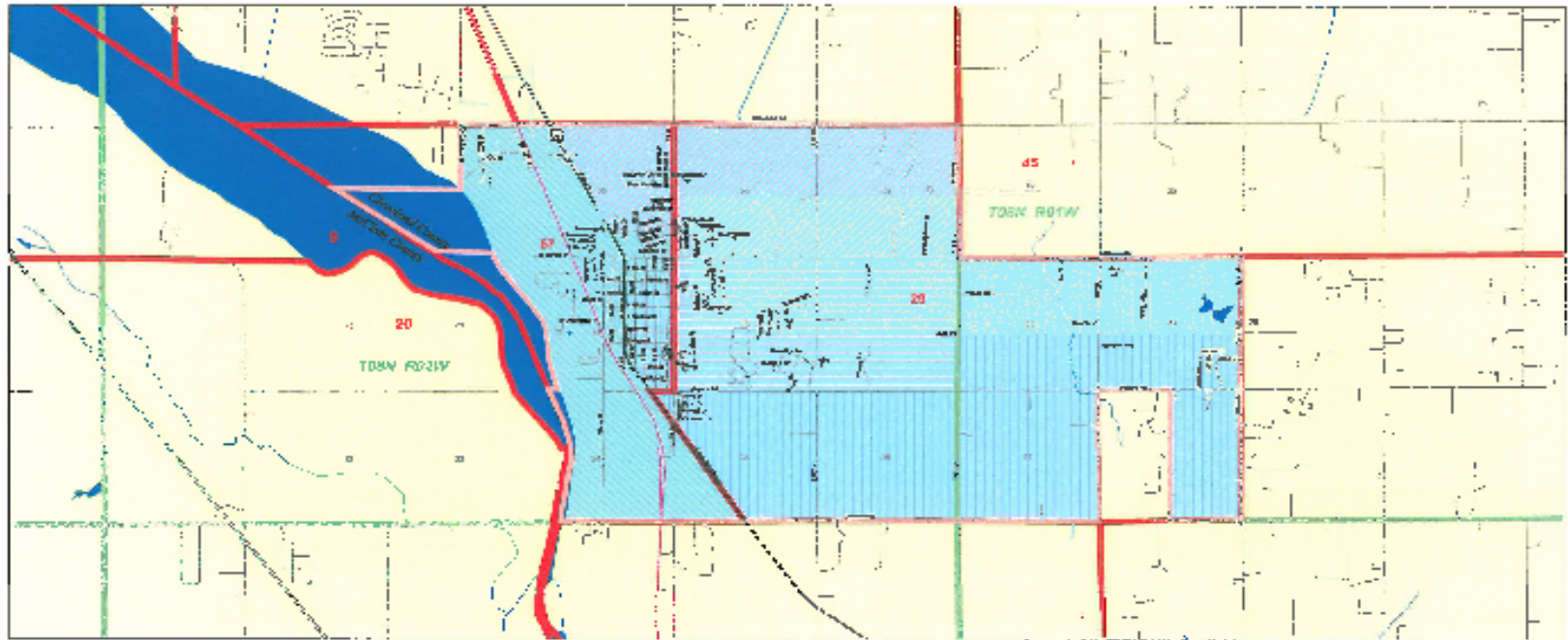




# City of Noble



# Noble, Oklahoma Cleveland County



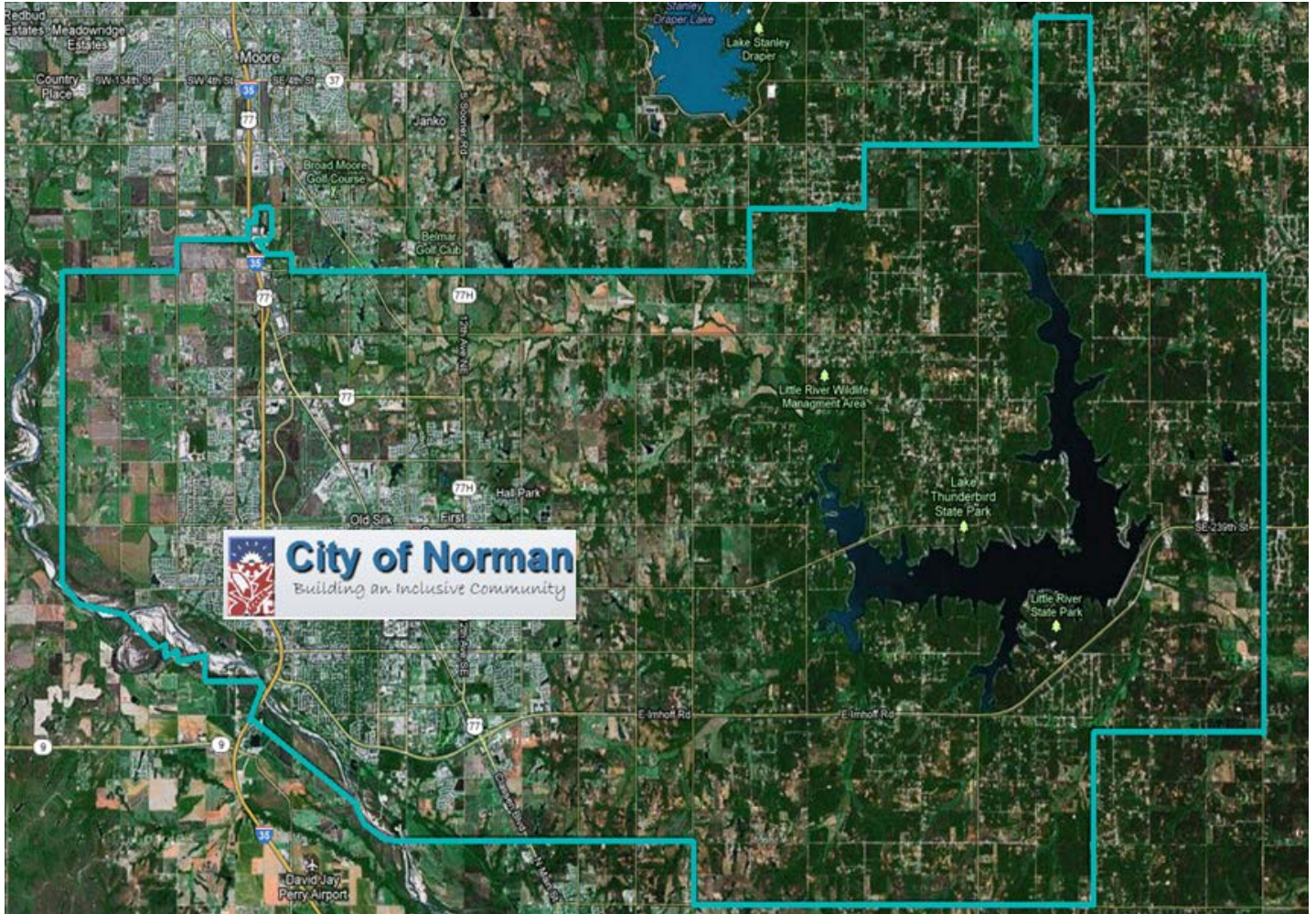
- | Noble       | Wards  |
|-------------|--------|
| City Limits | Ward 1 |
| Precincts   | Ward 2 |
| Highways    | Ward 3 |
| Roads       | Ward 4 |
| Railroads   |        |
| Hydrography |        |

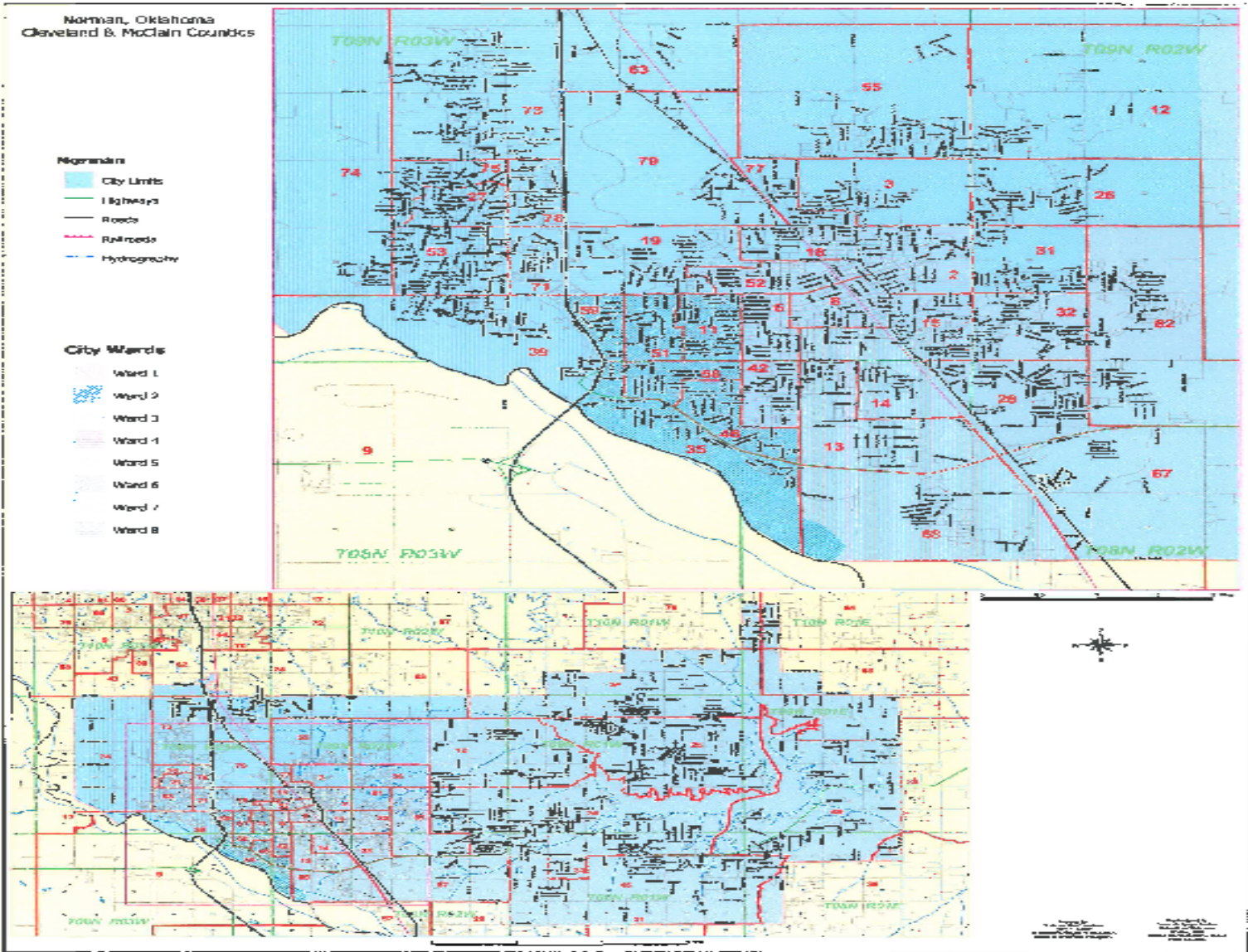
Prepared for  
Oklahoma's Top Communities  
(505) 533-8290  
If you have any questions or need more  
copies, please contact the agency.



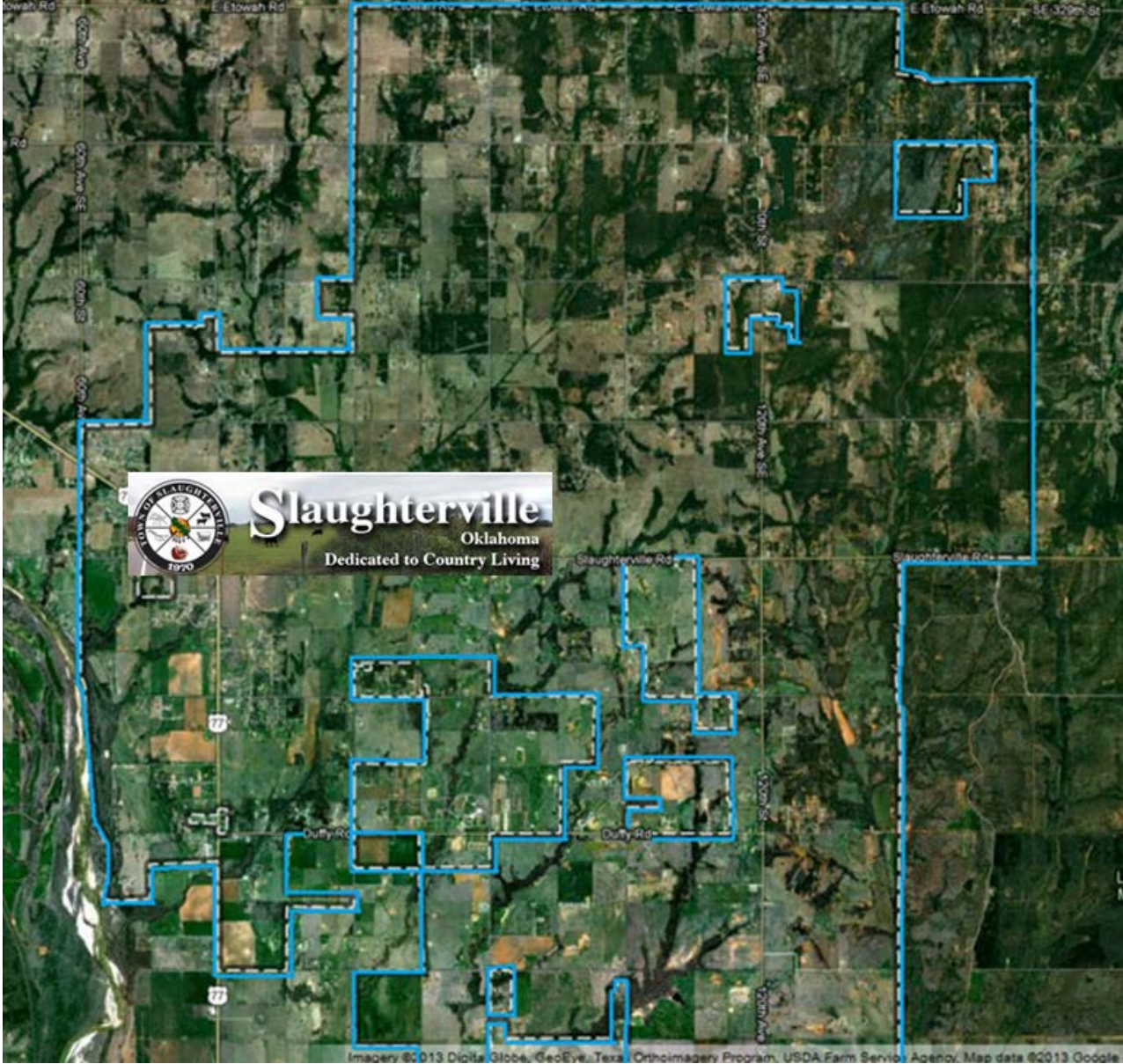
Map Produced By:  
Center for Economic Research  
University of Oklahoma  
August, 2015  
Contact Us For Additional Copies  
(505) 575-5117

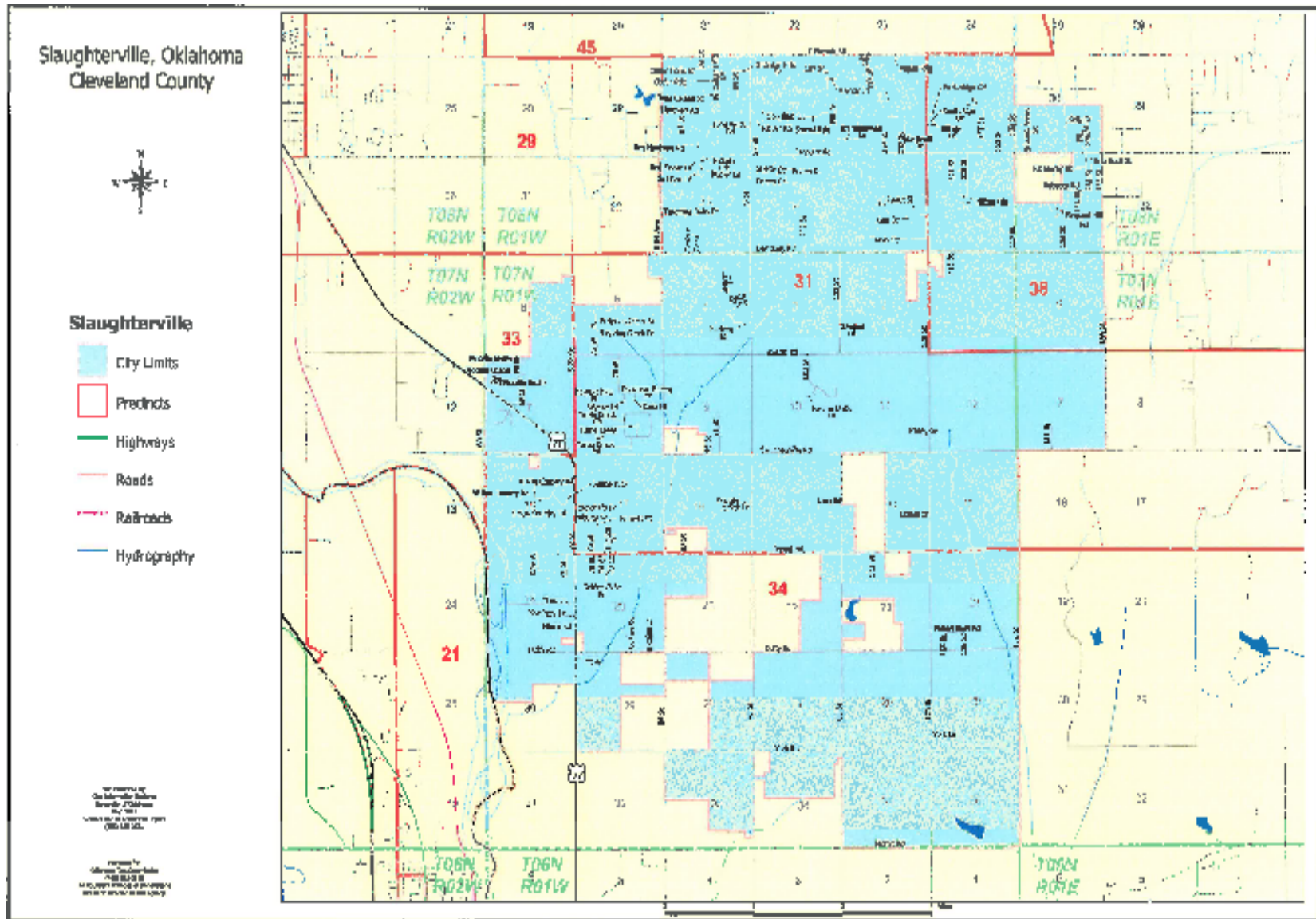
# City of Norman





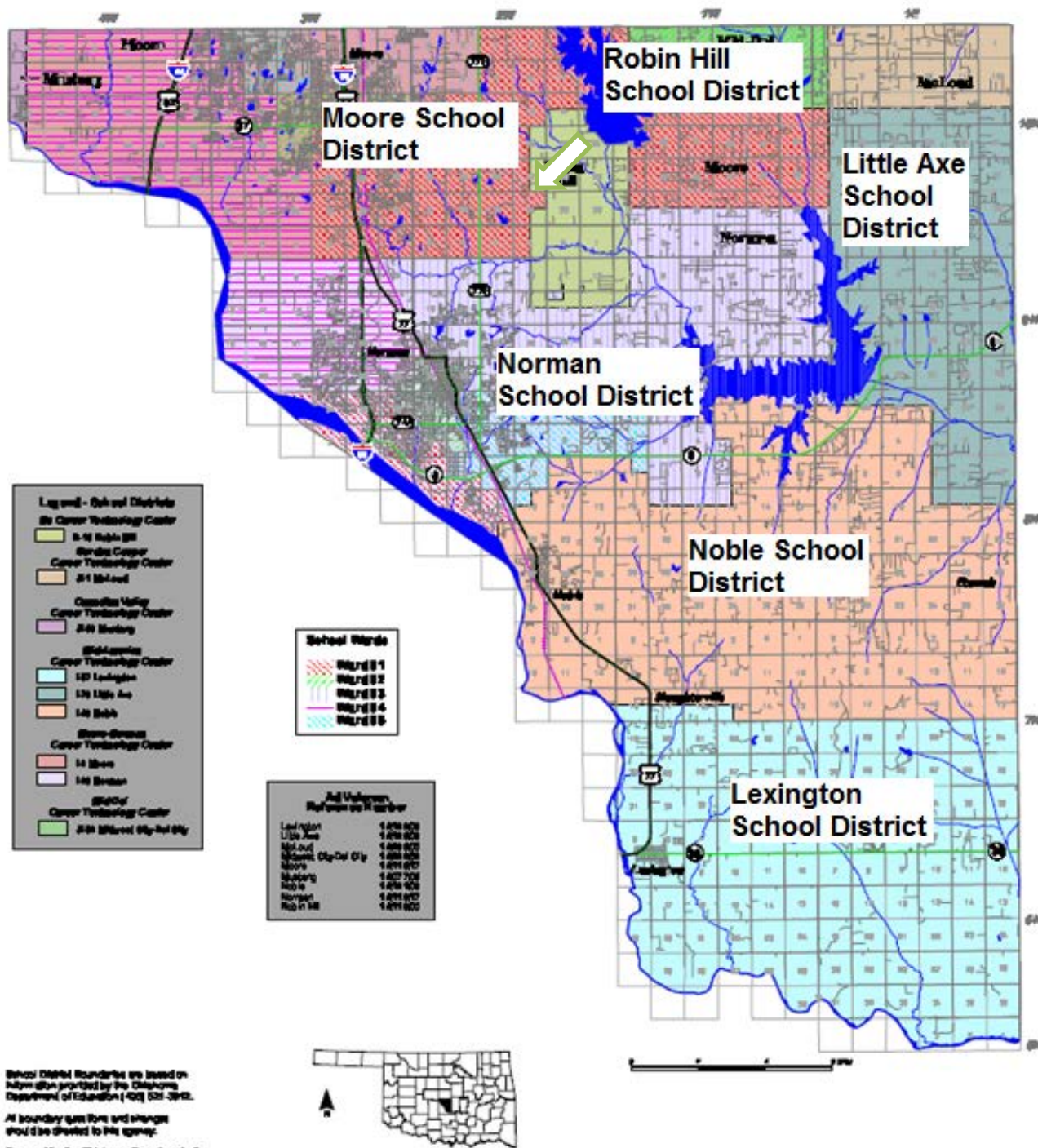
# Town of Slaughterville





- Cleveland County School Districts

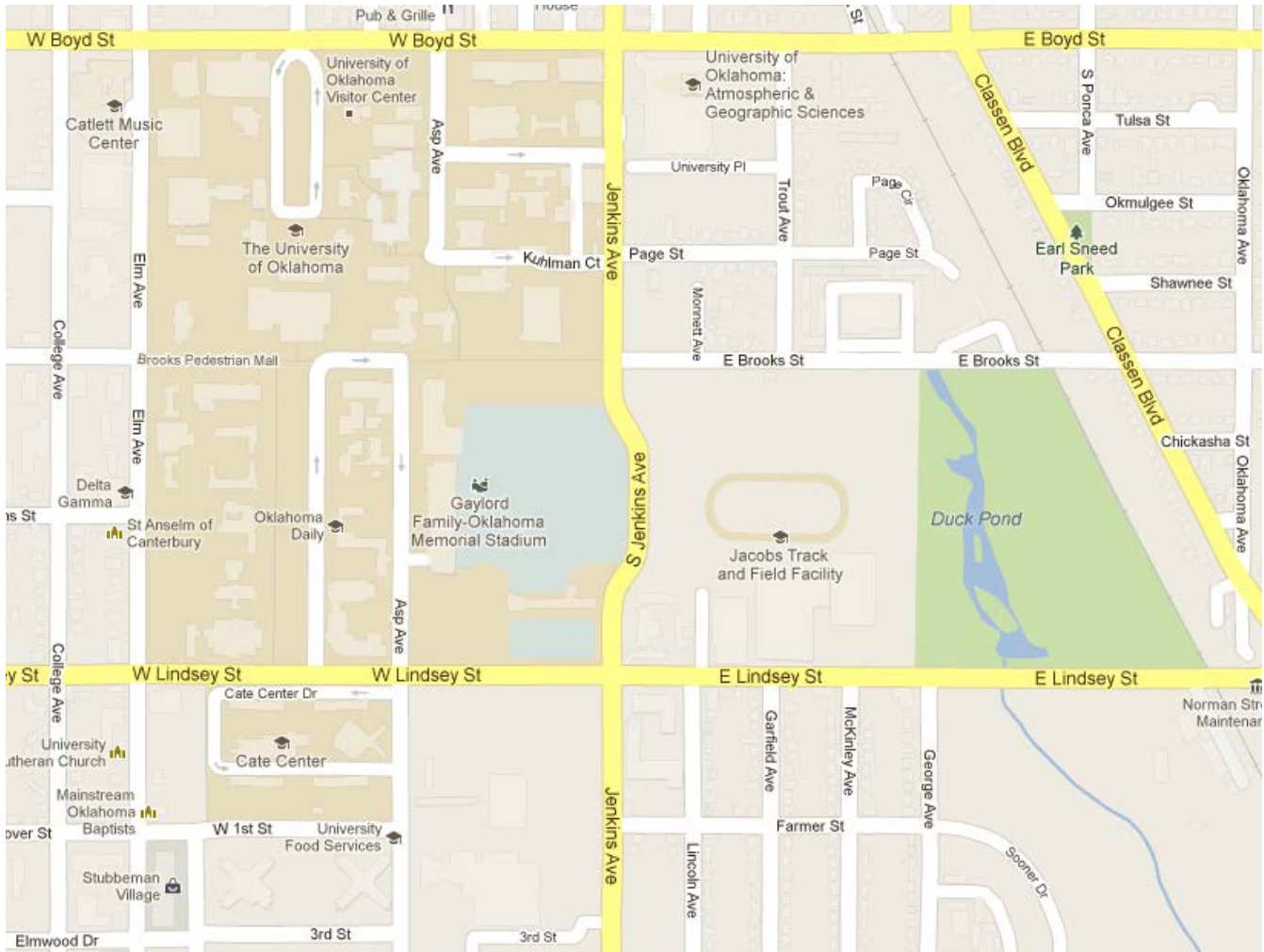
# Cleveland County



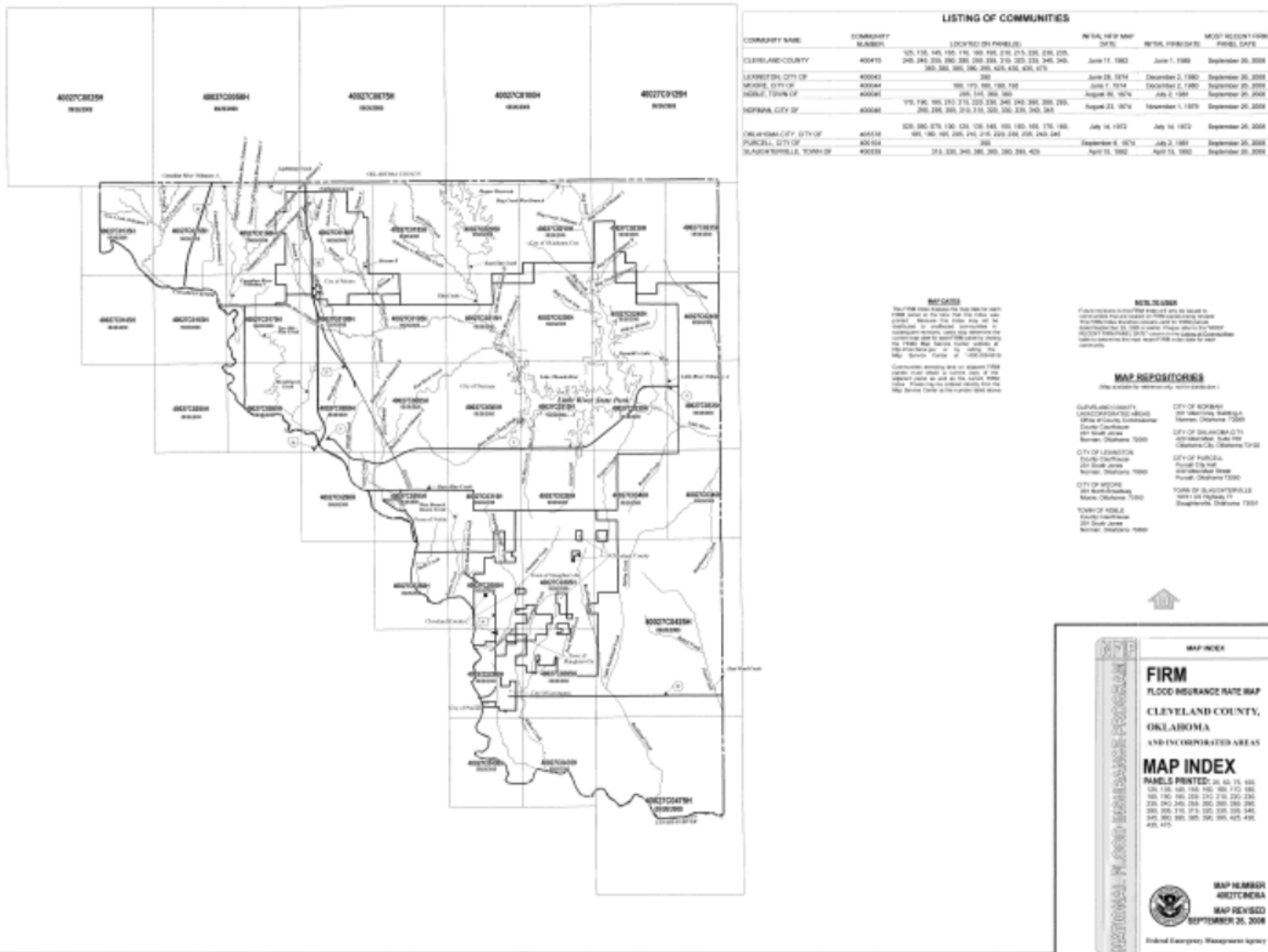
Map source: Oklahoma Department of Education



- University of Oklahoma Campus Map



- FIRM Maps



40027CIND0A



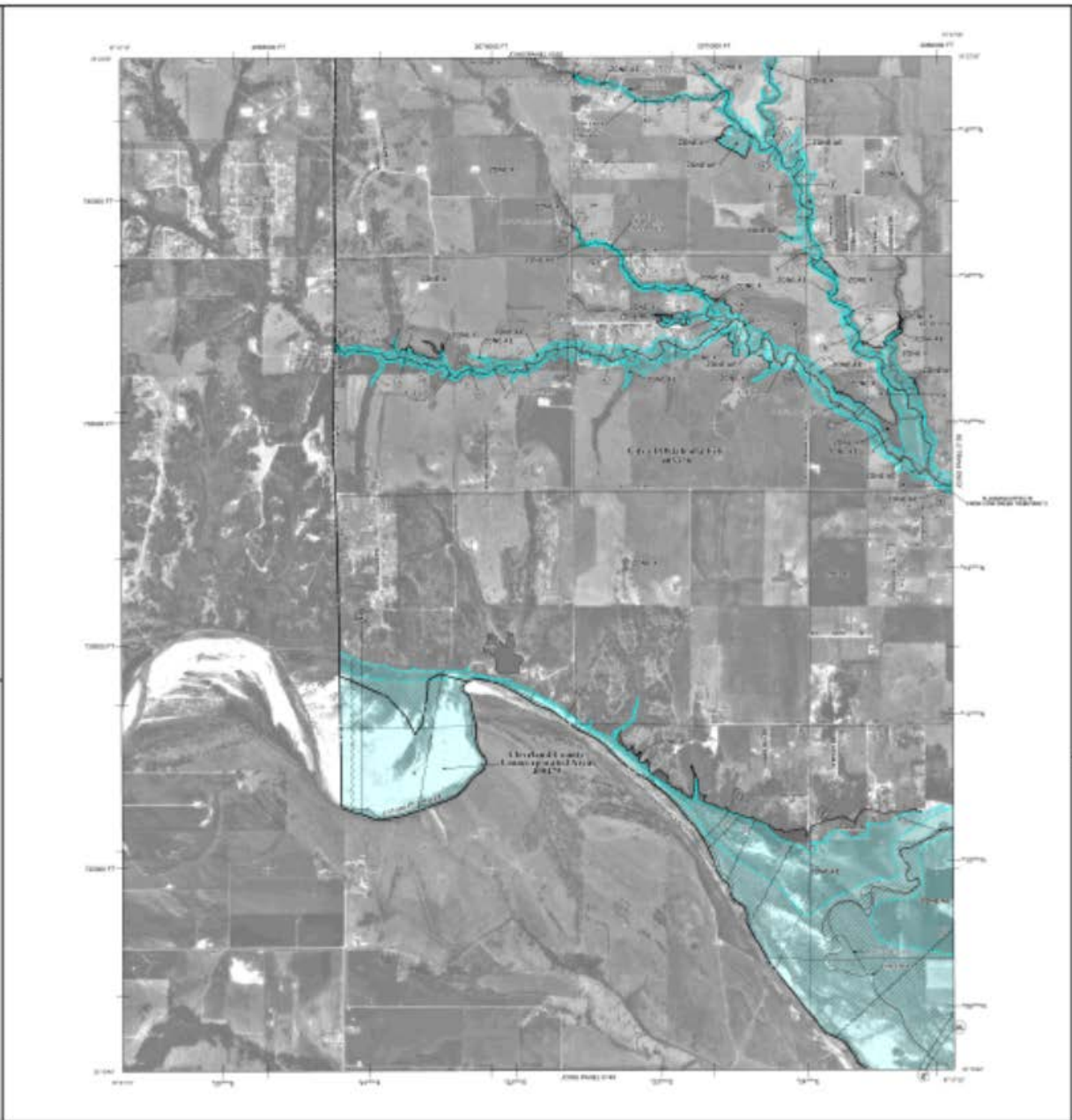
**NOTES TO USERS**

This map is for general informational purposes only. It does not constitute an offer of insurance or any other financial product. For more information, please contact your insurance agent or the Oklahoma Department of Insurance at (405) 509-7000.

The map is based on the most current information available. The information is subject to change without notice. The information is provided as a service to the public and is not intended to be used as a basis for any legal action.

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**LEGEND**

**Special Flood Hazard Areas (SFHA) Subject to Mandatory Flood Insurance Purchase**

**Zone A** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone B** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone C** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone D** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

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**Zone J** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone K** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone L** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone M** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone N** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone O** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone P** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone Q** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone R** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone S** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone T** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone U** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone V** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone W** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone X** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone Y** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Zone Z** Special Flood Hazard Area (SFHA) Subject to Mandatory Flood Insurance Purchase (1% Annual Flood Hazard)

**Other Flood Areas**

**Other Areas**

**County Boundary**

**City Boundary**

**Water Body**

**Highway**

**Other**

**Scale**

**North Arrow**

**Map Information**

**Map Number**

**Map Title**

**Map Date**

**Map Author**

**Map Contact**

40027C0135H

**FIRM**

**FLOOD INSURANCE RATE MAP**

**CLEVELAND COUNTY**

**OKLAHOMA**

**AND INCORPORATED AREAS**

**PANEL 135 OF 475**

**DATE MAP WAS FIRST PRINTED: 08/01/19**

**DATE MAP WAS LAST REVISED: 09/26/19**

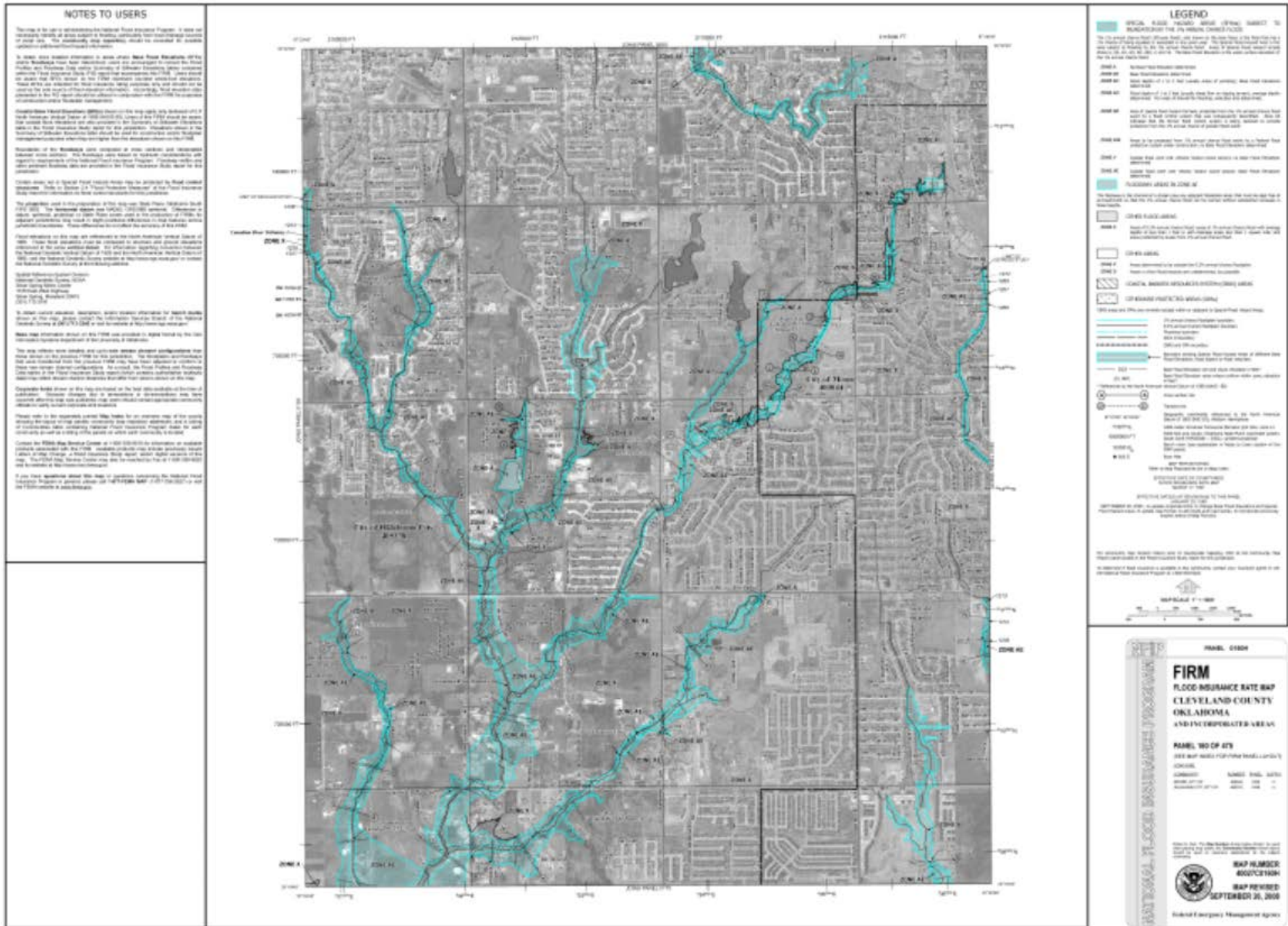
**MAP NUMBER: 40027C0135H**

**MAP REVISED: SEPTEMBER 26, 2019**

**National Emergency Management Agency**



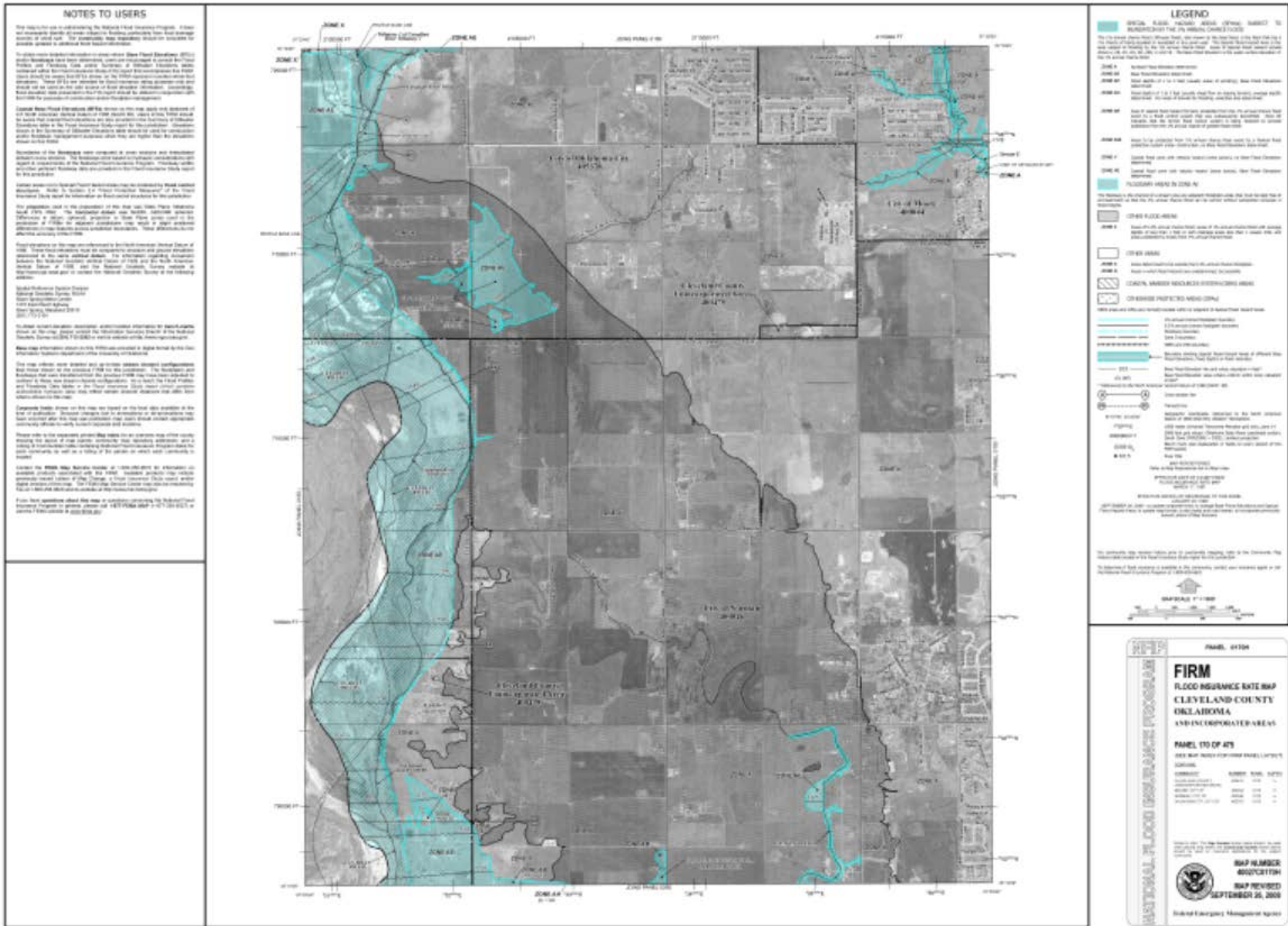




40027C0160H







40027C0170H















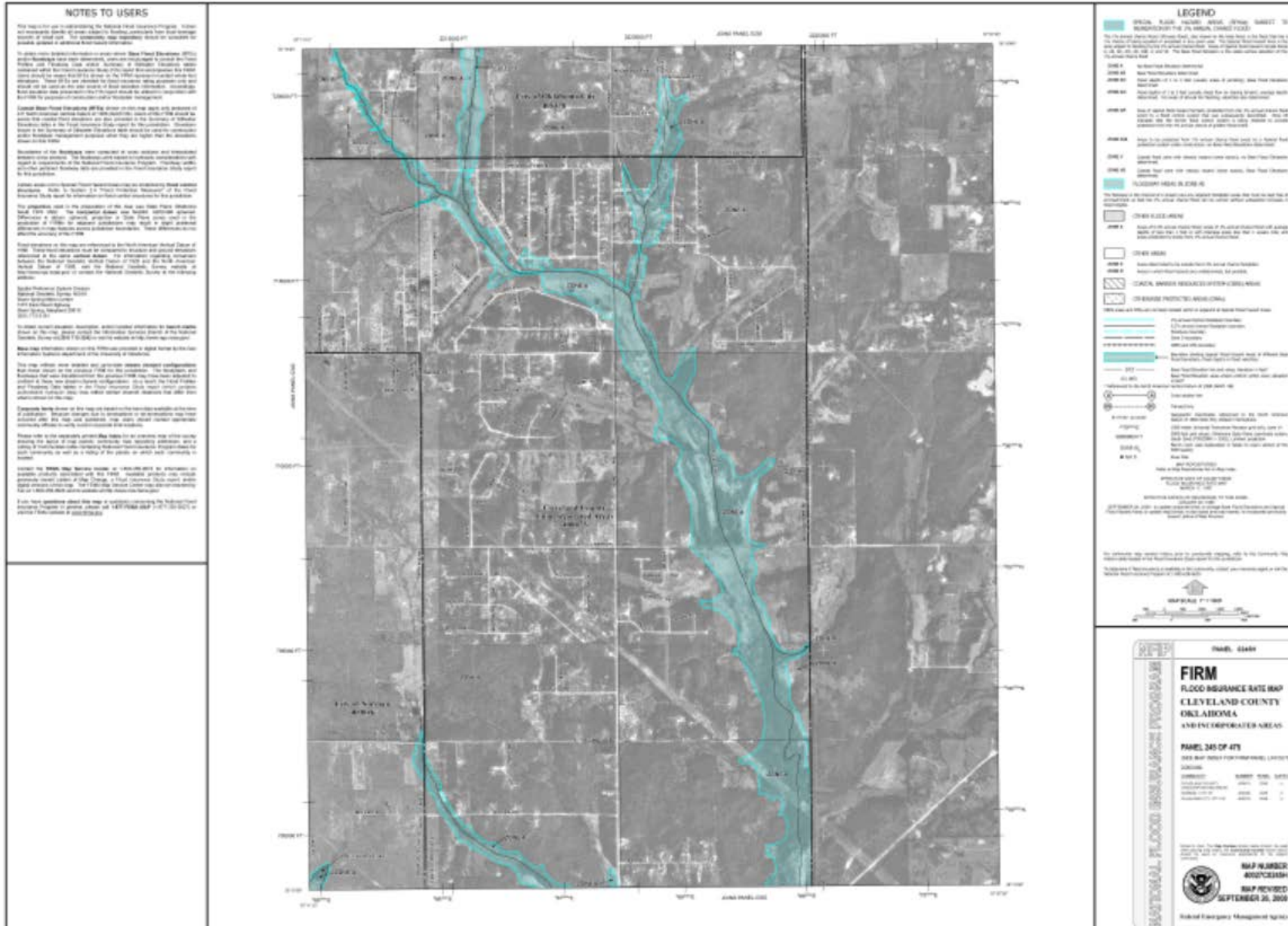












40027C0245H





























**NOTES TO USERS**

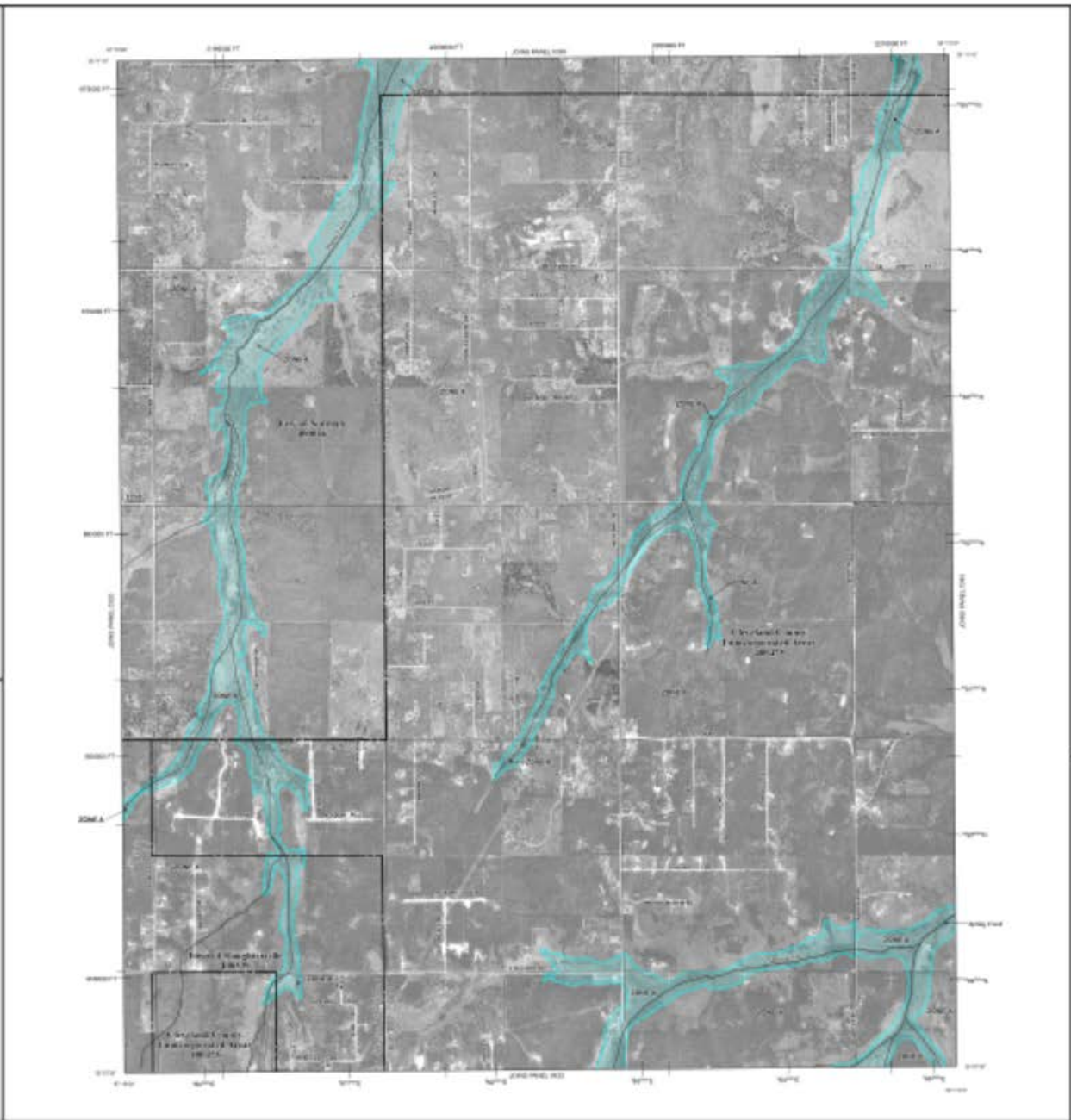
This map is for use in determining the required flood insurance program. It does not constitute a guarantee of water elevation. Water elevations from flood damage actions or other uses of the information may vary from those shown on this map. The user should consult the Flood Insurance Rate Map (FIRM) for the area of interest for the most current information.

To determine the required flood insurance program, users should consult the Flood Insurance Rate Map (FIRM) for the area of interest. The FIRM is available on the National Flood Insurance Program (NFIP) website at [www.flood.gov](http://www.flood.gov). The FIRM is available on the National Flood Insurance Program (NFIP) website at [www.flood.gov](http://www.flood.gov). The FIRM is available on the National Flood Insurance Program (NFIP) website at [www.flood.gov](http://www.flood.gov).

**Legend**

**SWHA, Flood Hazard Area (FHA), Subject to Mandatory Flood Insurance, Coastal Flood**

**SWHA**  
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**LEGEND**

**SWHA, Flood Hazard Area (FHA), Subject to Mandatory Flood Insurance, Coastal Flood**

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**Other Legend Items:**

- City Limits
- County Boundary
- Waterway
- Highway
- Power Line
- Telephone Line
- Other Infrastructure

**Scale:** 1:50,000

**North Arrow**

**FIRM**

**FLOOD INSURANCE RATE MAP**

**CLEVELAND COUNTY**

**OKLAHOMA**

**AND INCORPORATED AREAS**

**PANEL 340 OF 475**

**DATE: MAY 2008**

**MAP NUMBER: 40027C0340H**

**MAP REVISED: SEPTEMBER 26, 2008**

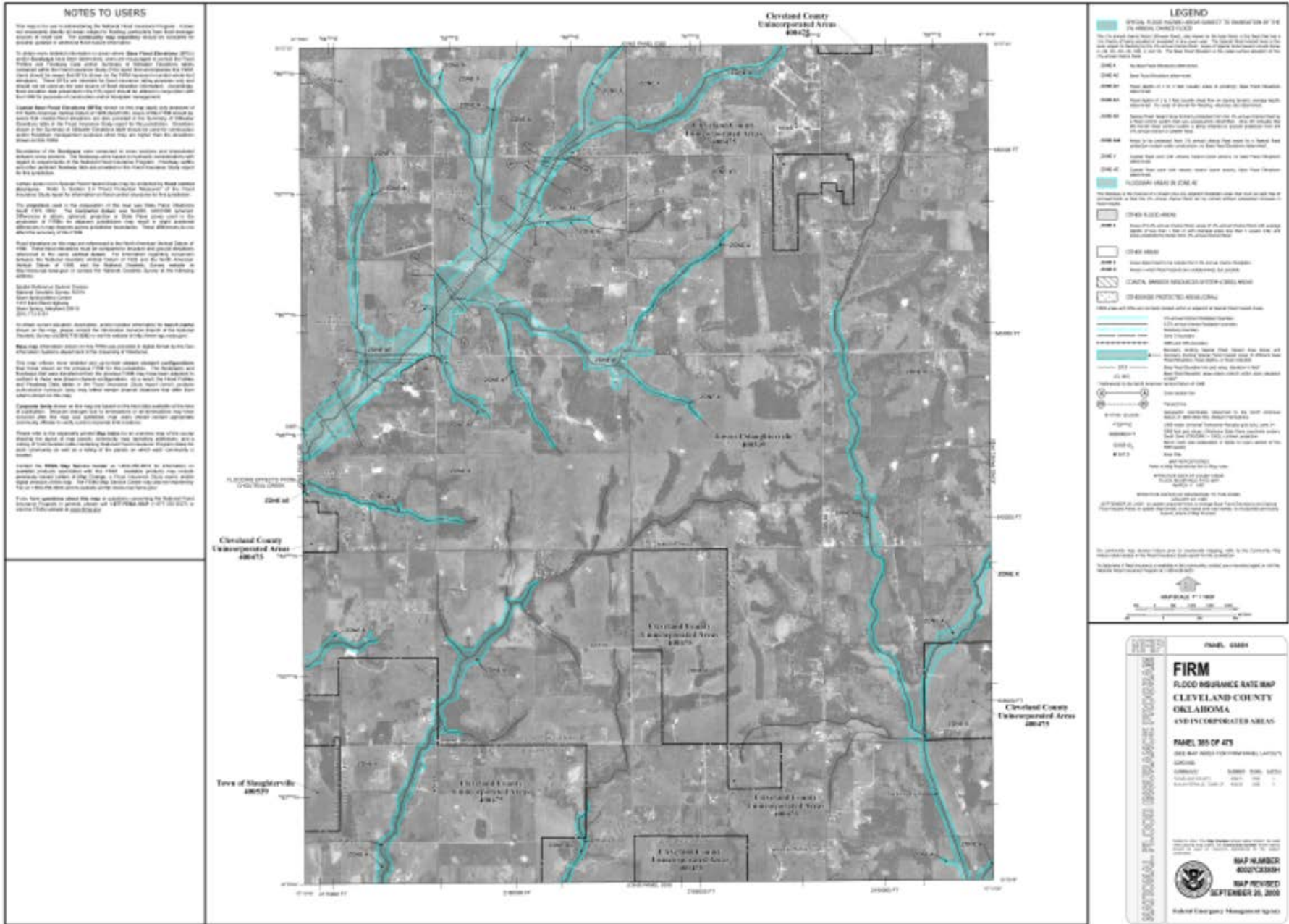
**Federal Emergency Management Agency**

40027C0340H

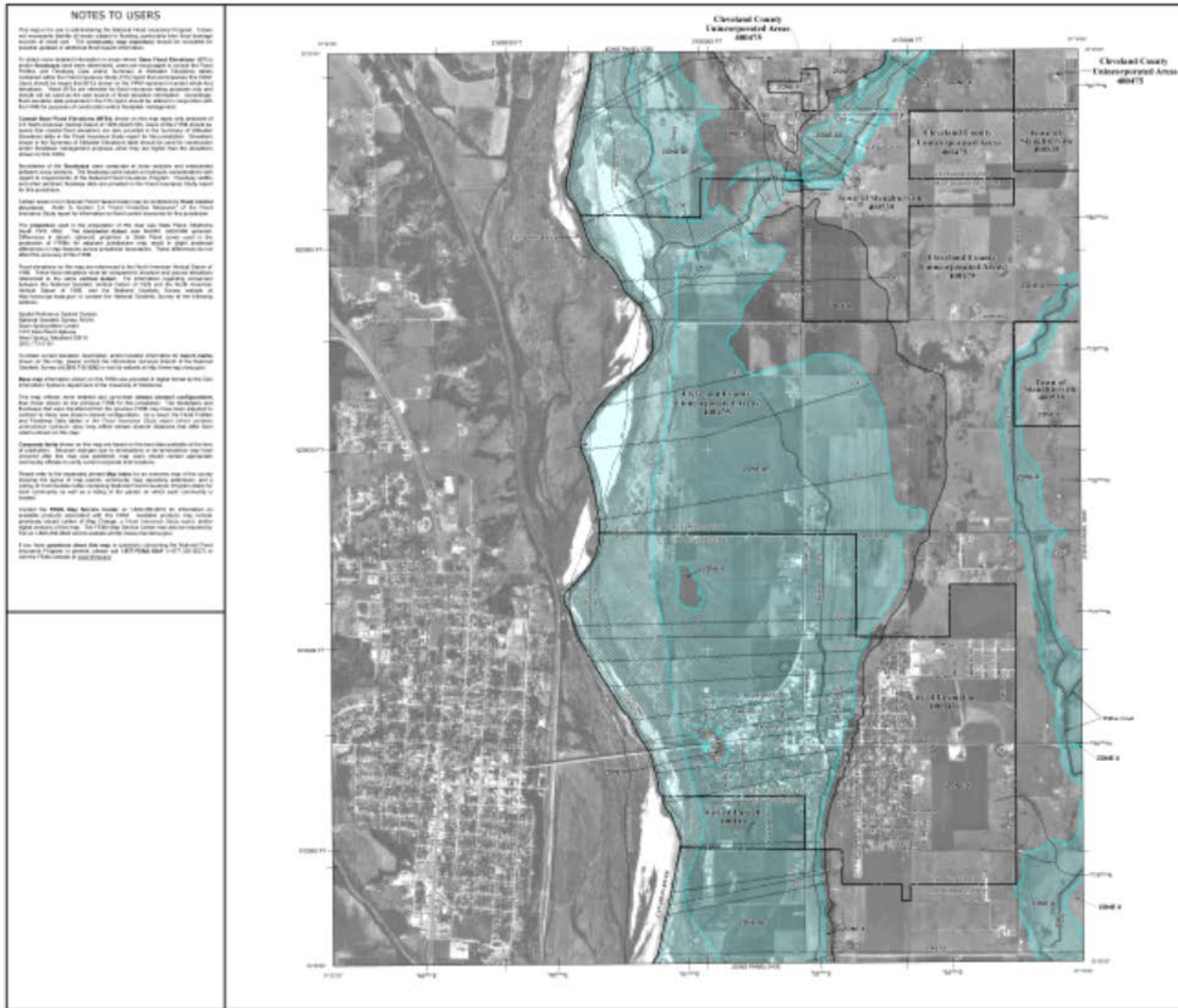








40027C0385H



**LEGEND**

**UNINCORPORATED AREAS SUBJECT TO FLOODING FOR THE 100-YEAR FLOOD**

**100-YEAR FLOOD**  
 100-year flood hazard area, including the 100-year flood plain, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 100-year flood.

**500-YEAR FLOOD**  
 500-year flood hazard area, including the 500-year flood plain, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 500-year flood.

**100-YEAR FLOOD PLAIN**  
 100-year flood plain, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 100-year flood.

**500-YEAR FLOOD PLAIN**  
 500-year flood plain, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 500-year flood.

**100-YEAR FLOOD PLAIN WITH HIGH WATER SURFACE ELEVATION**  
 100-year flood plain with high water surface elevation, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 100-year flood.

**500-YEAR FLOOD PLAIN WITH HIGH WATER SURFACE ELEVATION**  
 500-year flood plain with high water surface elevation, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 500-year flood.

**100-YEAR FLOOD PLAIN WITH HIGH WATER SURFACE ELEVATION AND FLOOD DAMAGE POTENTIAL**  
 100-year flood plain with high water surface elevation and flood damage potential, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 100-year flood.

**500-YEAR FLOOD PLAIN WITH HIGH WATER SURFACE ELEVATION AND FLOOD DAMAGE POTENTIAL**  
 500-year flood plain with high water surface elevation and flood damage potential, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 500-year flood.

**100-YEAR FLOOD PLAIN WITH HIGH WATER SURFACE ELEVATION AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL**  
 100-year flood plain with high water surface elevation and flood damage potential and flood damage potential, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 100-year flood.

**500-YEAR FLOOD PLAIN WITH HIGH WATER SURFACE ELEVATION AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL**  
 500-year flood plain with high water surface elevation and flood damage potential and flood damage potential, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 500-year flood.

**100-YEAR FLOOD PLAIN WITH HIGH WATER SURFACE ELEVATION AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL**  
 100-year flood plain with high water surface elevation and flood damage potential and flood damage potential and flood damage potential, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 100-year flood.

**500-YEAR FLOOD PLAIN WITH HIGH WATER SURFACE ELEVATION AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL**  
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**100-YEAR FLOOD PLAIN WITH HIGH WATER SURFACE ELEVATION AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL**  
 100-year flood plain with high water surface elevation and flood damage potential and flood damage potential and flood damage potential and flood damage potential, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 100-year flood.

**500-YEAR FLOOD PLAIN WITH HIGH WATER SURFACE ELEVATION AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL AND FLOOD DAMAGE POTENTIAL**  
 500-year flood plain with high water surface elevation and flood damage potential and flood damage potential and flood damage potential and flood damage potential, as determined by the National Flood Insurance Program (NFIP) Flood Insurance Study (FIS) and the Flood Hazard Risk Assessment (FHRA) for the 500-year flood.

**PANEL 030H**

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**CLEVELAND COUNTY**  
**OKLAHOMA**  
**AND INCORPORATED AREAS**

**PANEL 30 OF 475**

**2015 FIRM MAP NUMBER**

| DATE | REVISION | BY  | DATE |
|------|----------|-----|------|
| 2015 | 1        | ... | ...  |
| 2015 | 2        | ... | ...  |
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**MAP NUMBER**  
**40027C0390H**

**MAP REVISED**  
**SEPTEMBER 26, 2015**

**Robert Emergency Management Agency**

40027C0390H





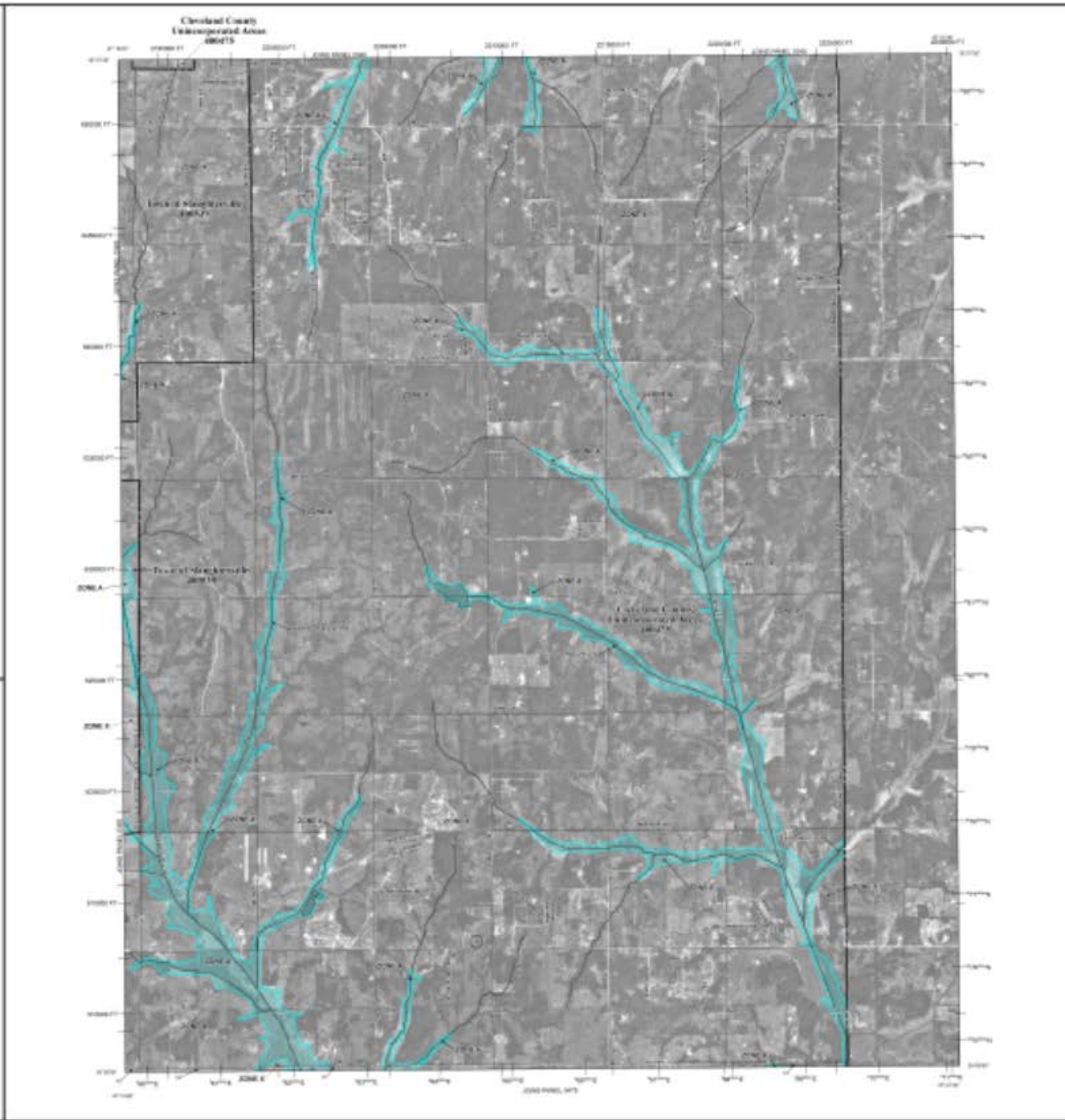
**NOTES TO USERS**

This information is provided for informational purposes only. It is not intended to be used as a basis for insurance coverage. Flood insurance coverage is provided by the Federal Emergency Management Agency (FEMA) through the National Flood Insurance Program (NFIP). Flood insurance coverage is not available in certain areas of the United States. Flood insurance coverage is not available in certain areas of the United States. Flood insurance coverage is not available in certain areas of the United States. Flood insurance coverage is not available in certain areas of the United States.

**General Note:** This map shows the Special Flood Hazard Areas (SFHAs) for the area shown. The SFHAs are based on the Flood Insurance Rate Study (FIRMS) data for the area shown. The SFHAs are based on the Flood Insurance Rate Study (FIRMS) data for the area shown. The SFHAs are based on the Flood Insurance Rate Study (FIRMS) data for the area shown. The SFHAs are based on the Flood Insurance Rate Study (FIRMS) data for the area shown.

**Legend:**

- Special Flood Hazard Areas (SFHAs):**
  - Zone A: 1% Annual Flood Hazard
  - Zone B: 1% Annual Flood Hazard
  - Zone C: 1% Annual Flood Hazard
  - Zone D: 1% Annual Flood Hazard
  - Zone E: 1% Annual Flood Hazard
  - Zone F: 1% Annual Flood Hazard
  - Zone G: 1% Annual Flood Hazard
  - Zone H: 1% Annual Flood Hazard
  - Zone I: 1% Annual Flood Hazard
  - Zone J: 1% Annual Flood Hazard
  - Zone K: 1% Annual Flood Hazard
  - Zone L: 1% Annual Flood Hazard
  - Zone M: 1% Annual Flood Hazard
  - Zone N: 1% Annual Flood Hazard
  - Zone O: 1% Annual Flood Hazard
  - Zone P: 1% Annual Flood Hazard
  - Zone Q: 1% Annual Flood Hazard
  - Zone R: 1% Annual Flood Hazard
  - Zone S: 1% Annual Flood Hazard
  - Zone T: 1% Annual Flood Hazard
  - Zone U: 1% Annual Flood Hazard
  - Zone V: 1% Annual Flood Hazard
  - Zone W: 1% Annual Flood Hazard
  - Zone X: 1% Annual Flood Hazard
  - Zone Y: 1% Annual Flood Hazard
  - Zone Z: 1% Annual Flood Hazard
- Other Areas:**
  - Zone AA: 1% Annual Flood Hazard
  - Zone AB: 1% Annual Flood Hazard
  - Zone AC: 1% Annual Flood Hazard
  - Zone AD: 1% Annual Flood Hazard
  - Zone AE: 1% Annual Flood Hazard
  - Zone AF: 1% Annual Flood Hazard
  - Zone AG: 1% Annual Flood Hazard
  - Zone AH: 1% Annual Flood Hazard
  - Zone AI: 1% Annual Flood Hazard
  - Zone AJ: 1% Annual Flood Hazard
  - Zone AK: 1% Annual Flood Hazard
  - Zone AL: 1% Annual Flood Hazard
  - Zone AM: 1% Annual Flood Hazard
  - Zone AN: 1% Annual Flood Hazard
  - Zone AO: 1% Annual Flood Hazard
  - Zone AP: 1% Annual Flood Hazard
  - Zone AQ: 1% Annual Flood Hazard
  - Zone AR: 1% Annual Flood Hazard
  - Zone AS: 1% Annual Flood Hazard
  - Zone AT: 1% Annual Flood Hazard
  - Zone AU: 1% Annual Flood Hazard
  - Zone AV: 1% Annual Flood Hazard
  - Zone AW: 1% Annual Flood Hazard
  - Zone AX: 1% Annual Flood Hazard
  - Zone AY: 1% Annual Flood Hazard
  - Zone AZ: 1% Annual Flood Hazard



**LEGEND**

**SPECIAL FLOOD HAZARD AREAS (SFHAs)**

- Zone A: 1% Annual Flood Hazard
- Zone B: 1% Annual Flood Hazard
- Zone C: 1% Annual Flood Hazard
- Zone D: 1% Annual Flood Hazard
- Zone E: 1% Annual Flood Hazard
- Zone F: 1% Annual Flood Hazard
- Zone G: 1% Annual Flood Hazard
- Zone H: 1% Annual Flood Hazard
- Zone I: 1% Annual Flood Hazard
- Zone J: 1% Annual Flood Hazard
- Zone K: 1% Annual Flood Hazard
- Zone L: 1% Annual Flood Hazard
- Zone M: 1% Annual Flood Hazard
- Zone N: 1% Annual Flood Hazard
- Zone O: 1% Annual Flood Hazard
- Zone P: 1% Annual Flood Hazard
- Zone Q: 1% Annual Flood Hazard
- Zone R: 1% Annual Flood Hazard
- Zone S: 1% Annual Flood Hazard
- Zone T: 1% Annual Flood Hazard
- Zone U: 1% Annual Flood Hazard
- Zone V: 1% Annual Flood Hazard
- Zone W: 1% Annual Flood Hazard
- Zone X: 1% Annual Flood Hazard
- Zone Y: 1% Annual Flood Hazard
- Zone Z: 1% Annual Flood Hazard

**OTHER AREAS**

- Zone AA: 1% Annual Flood Hazard
- Zone AB: 1% Annual Flood Hazard
- Zone AC: 1% Annual Flood Hazard
- Zone AD: 1% Annual Flood Hazard
- Zone AE: 1% Annual Flood Hazard
- Zone AF: 1% Annual Flood Hazard
- Zone AG: 1% Annual Flood Hazard
- Zone AH: 1% Annual Flood Hazard
- Zone AI: 1% Annual Flood Hazard
- Zone AJ: 1% Annual Flood Hazard
- Zone AK: 1% Annual Flood Hazard
- Zone AL: 1% Annual Flood Hazard
- Zone AM: 1% Annual Flood Hazard
- Zone AN: 1% Annual Flood Hazard
- Zone AO: 1% Annual Flood Hazard
- Zone AP: 1% Annual Flood Hazard
- Zone AQ: 1% Annual Flood Hazard
- Zone AR: 1% Annual Flood Hazard
- Zone AS: 1% Annual Flood Hazard
- Zone AT: 1% Annual Flood Hazard
- Zone AU: 1% Annual Flood Hazard
- Zone AV: 1% Annual Flood Hazard
- Zone AW: 1% Annual Flood Hazard
- Zone AX: 1% Annual Flood Hazard
- Zone AY: 1% Annual Flood Hazard
- Zone AZ: 1% Annual Flood Hazard

**COASTAL FLOOD PROTECTION AREAS (CFPAs)**

- Zone AA: 1% Annual Flood Hazard
- Zone AB: 1% Annual Flood Hazard
- Zone AC: 1% Annual Flood Hazard
- Zone AD: 1% Annual Flood Hazard
- Zone AE: 1% Annual Flood Hazard
- Zone AF: 1% Annual Flood Hazard
- Zone AG: 1% Annual Flood Hazard
- Zone AH: 1% Annual Flood Hazard
- Zone AI: 1% Annual Flood Hazard
- Zone AJ: 1% Annual Flood Hazard
- Zone AK: 1% Annual Flood Hazard
- Zone AL: 1% Annual Flood Hazard
- Zone AM: 1% Annual Flood Hazard
- Zone AN: 1% Annual Flood Hazard
- Zone AO: 1% Annual Flood Hazard
- Zone AP: 1% Annual Flood Hazard
- Zone AQ: 1% Annual Flood Hazard
- Zone AR: 1% Annual Flood Hazard
- Zone AS: 1% Annual Flood Hazard
- Zone AT: 1% Annual Flood Hazard
- Zone AU: 1% Annual Flood Hazard
- Zone AV: 1% Annual Flood Hazard
- Zone AW: 1% Annual Flood Hazard
- Zone AX: 1% Annual Flood Hazard
- Zone AY: 1% Annual Flood Hazard
- Zone AZ: 1% Annual Flood Hazard

**Other Features:**

- 1:500 Flood Hazard Boundary
- 1:100 Flood Hazard Boundary
- 1:50 Flood Hazard Boundary
- 1:25 Flood Hazard Boundary
- 1:10 Flood Hazard Boundary
- 1:5 Flood Hazard Boundary
- 1:2 Flood Hazard Boundary
- 1:1 Flood Hazard Boundary
- 1:0.5 Flood Hazard Boundary
- 1:0.2 Flood Hazard Boundary
- 1:0.1 Flood Hazard Boundary
- 1:0.05 Flood Hazard Boundary
- 1:0.02 Flood Hazard Boundary
- 1:0.01 Flood Hazard Boundary
- 1:0.005 Flood Hazard Boundary
- 1:0.002 Flood Hazard Boundary
- 1:0.001 Flood Hazard Boundary
- 1:0.0005 Flood Hazard Boundary
- 1:0.0002 Flood Hazard Boundary
- 1:0.0001 Flood Hazard Boundary
- 1:0.00005 Flood Hazard Boundary
- 1:0.00002 Flood Hazard Boundary
- 1:0.00001 Flood Hazard Boundary

**Scale:** 1" = 1000'

**North Arrow:** [North Arrow]

**PANEL 4425H**

**FIRM**

**FLOOD INSURANCE RATE MAP**

**CLEVELAND COUNTY**

**OKLAHOMA**

**AND INCORPORATED AREAS**

**PANEL 425 OF 475**

**SEE MAP INDEX FOR PANEL LAYOUT**

**DATE:** 08/01/2008

**BY:** [Name]

**FOR:** [Name]

**SCALE:** 1" = 1000'

**MAP NUMBER:** 40027C0425H

**MAP REVISED:** SEPTEMBER 26, 2008

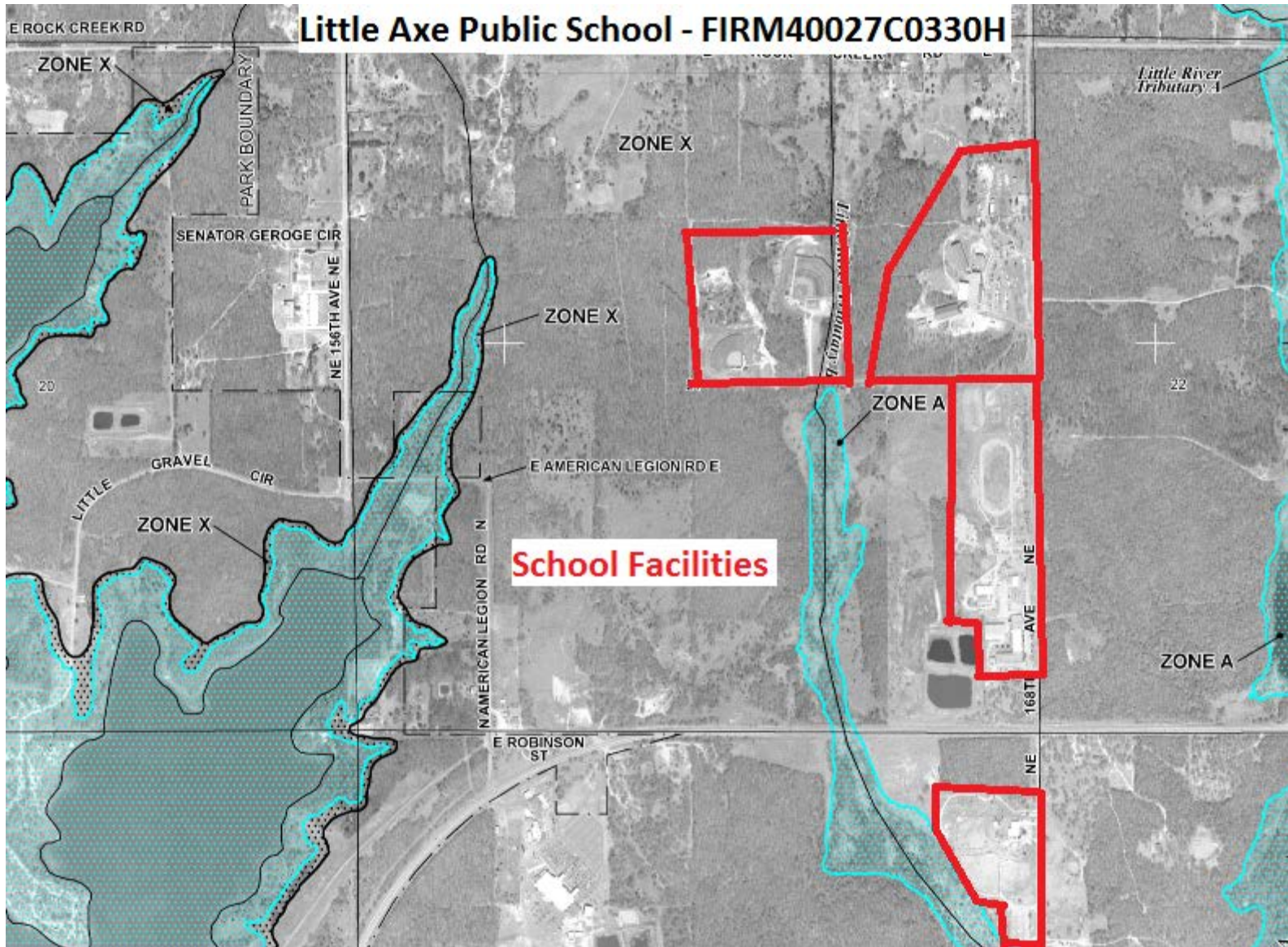
**Federal Emergency Management Agency**

40027C0425H

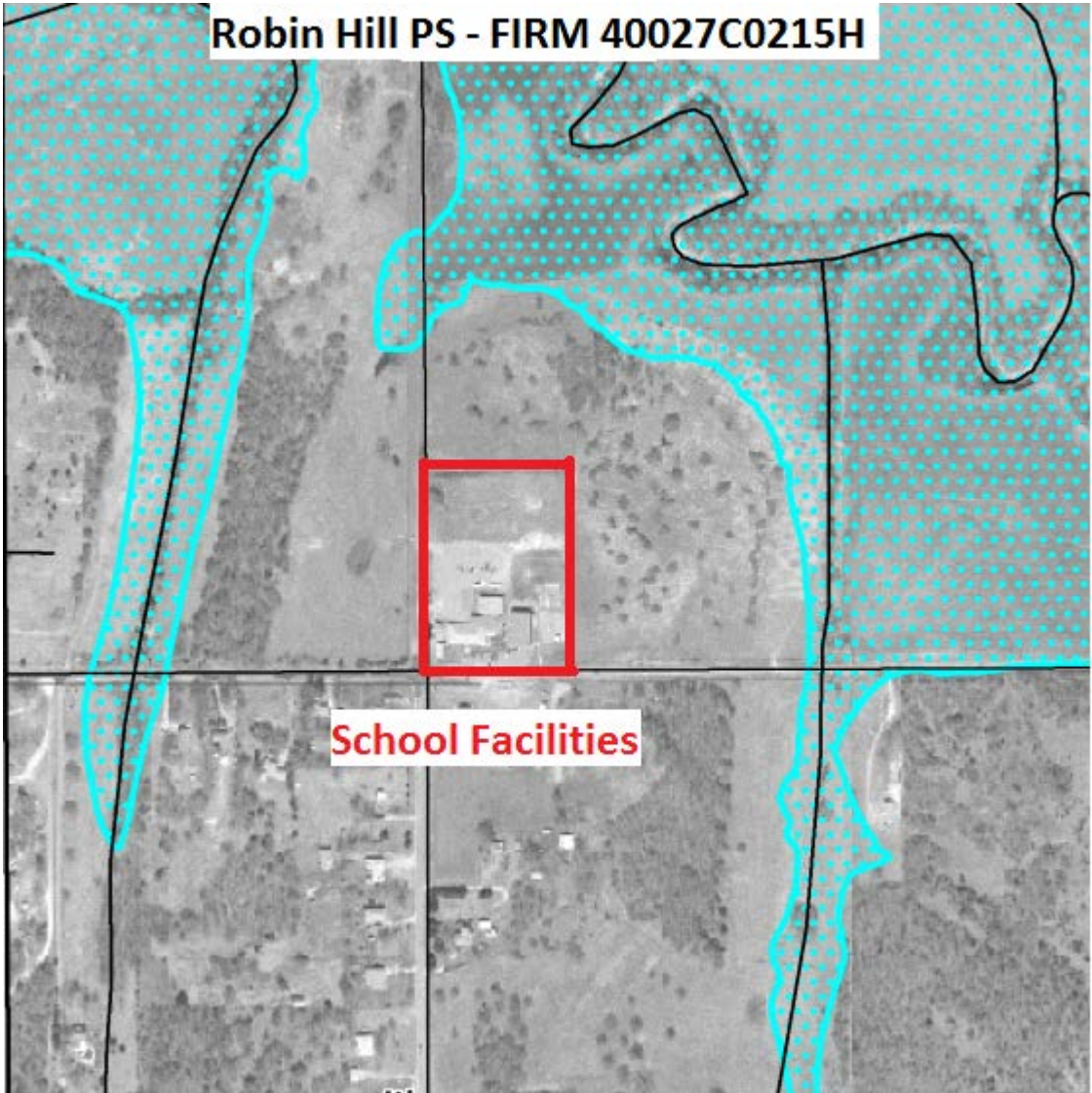




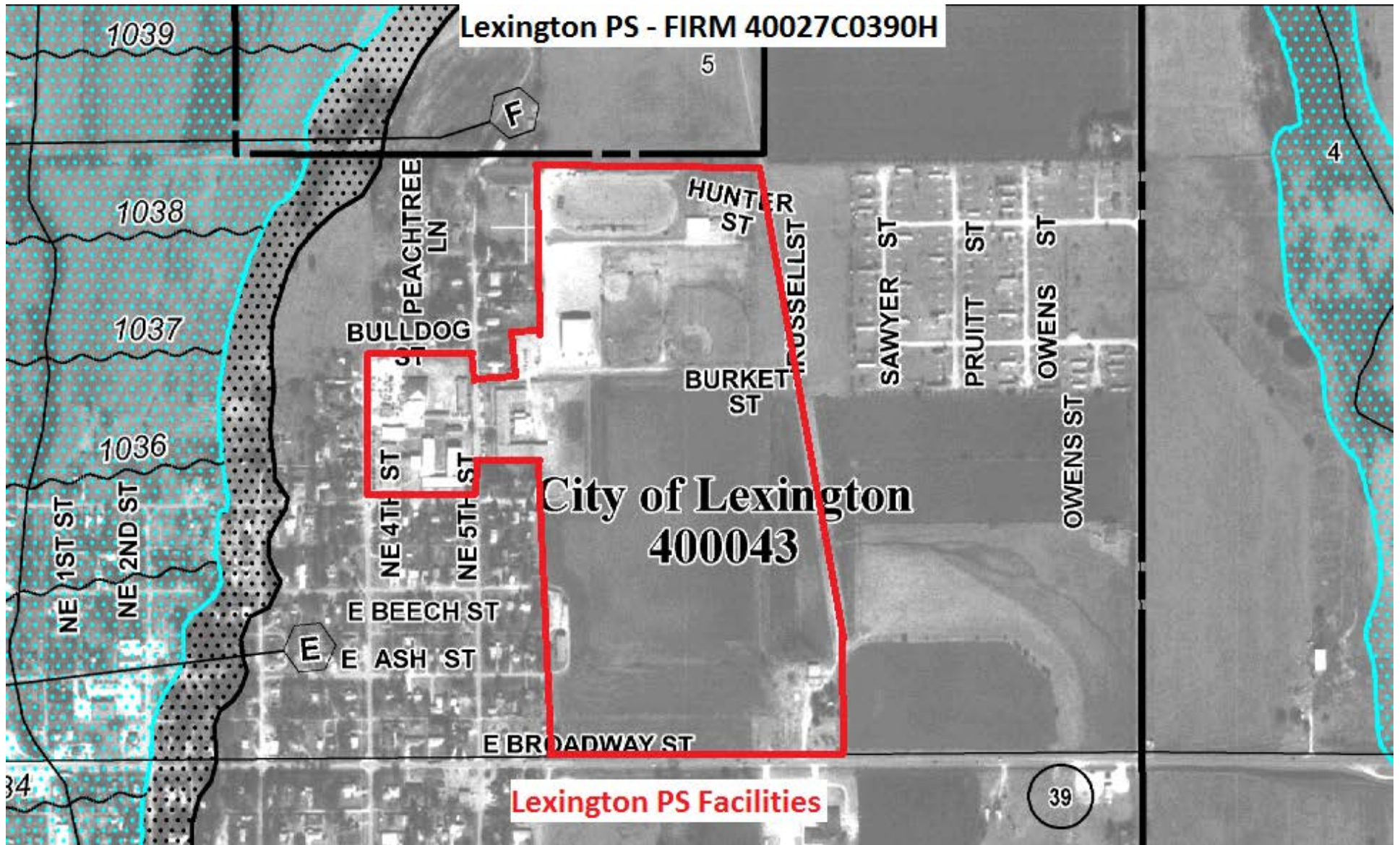


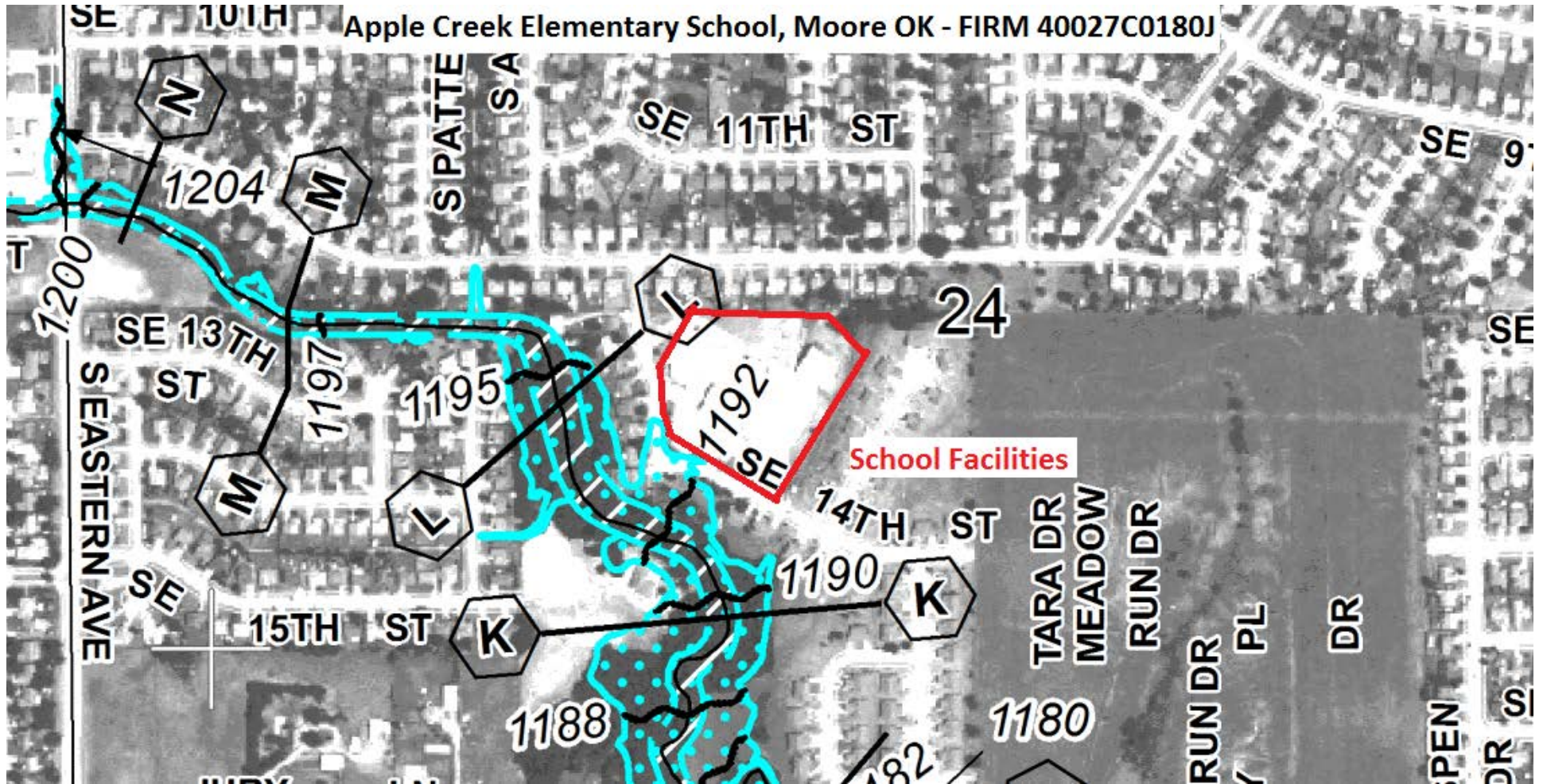


**Robin Hill PS - FIRM 40027C0215H**



**School Facilities**

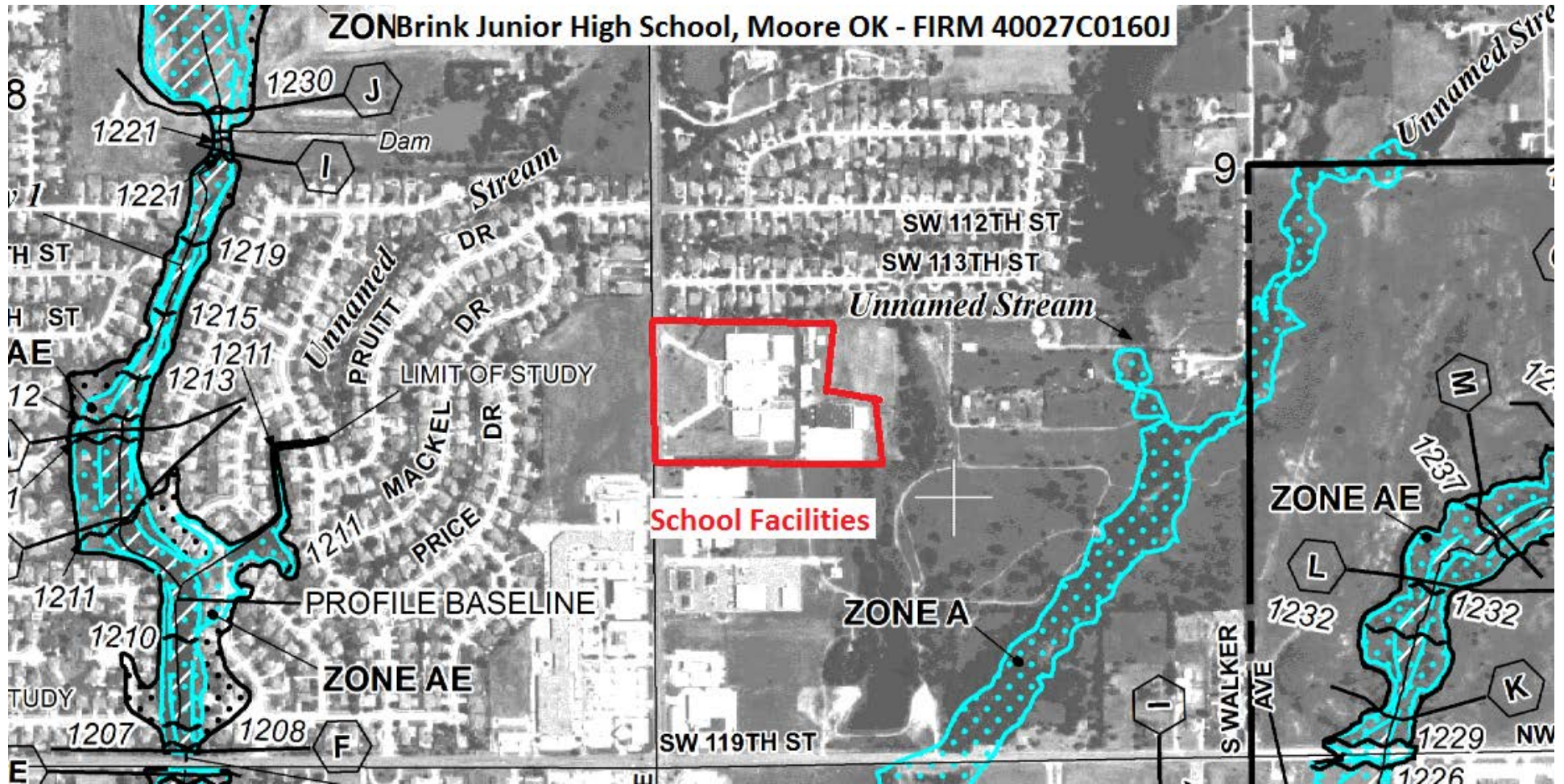




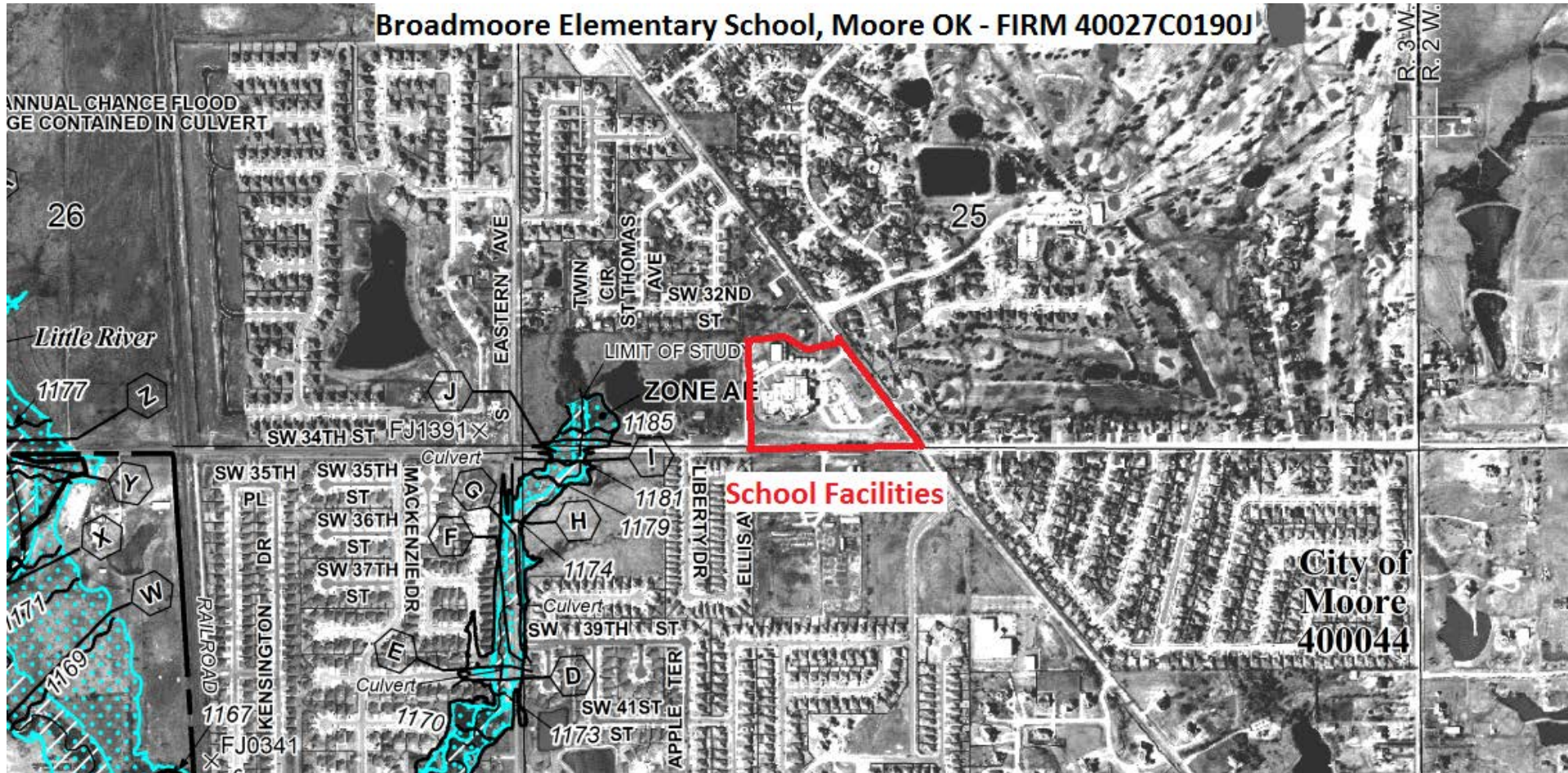




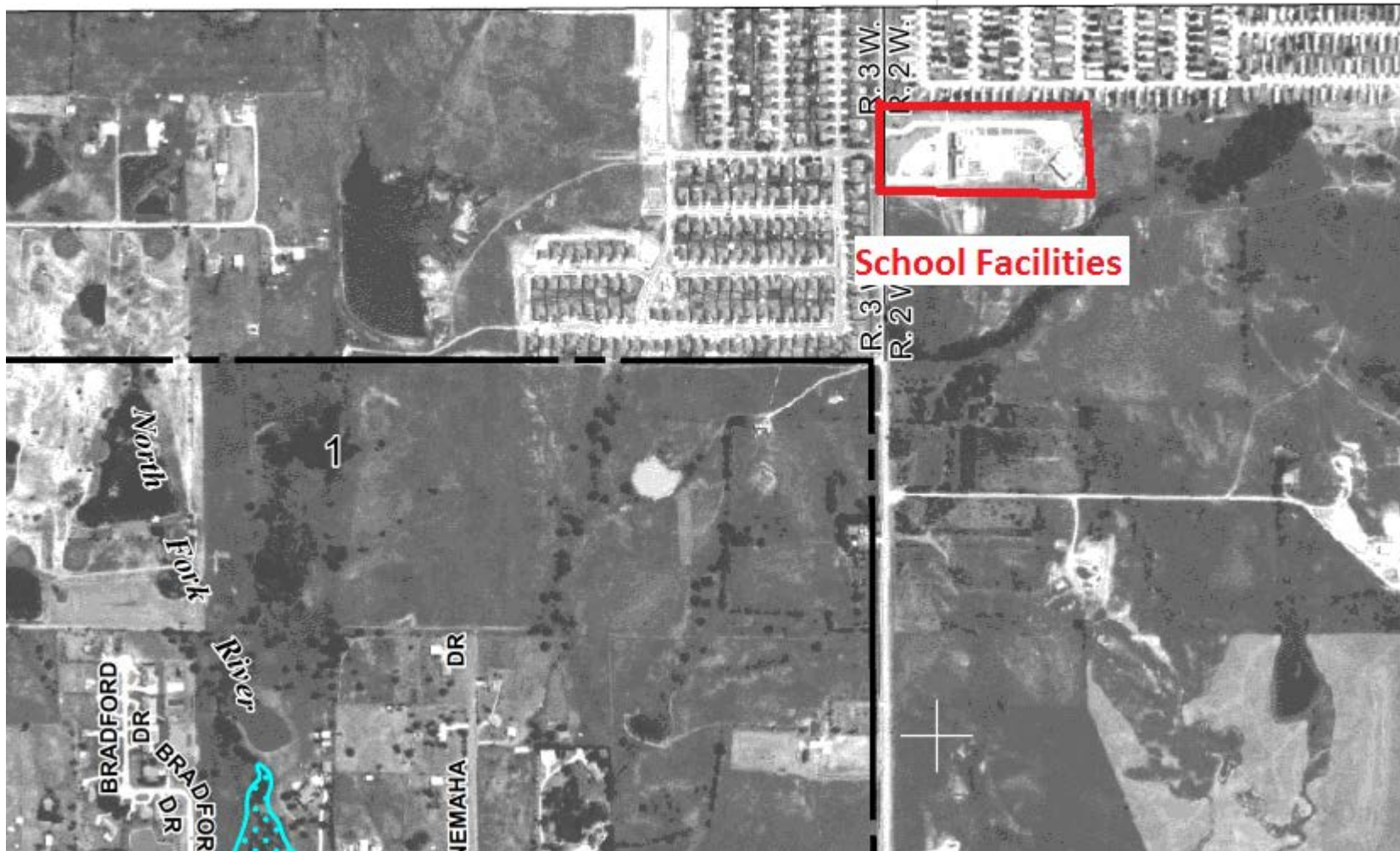
ZONBrink Junior High School, Moore OK - FIRM 40027C0160J

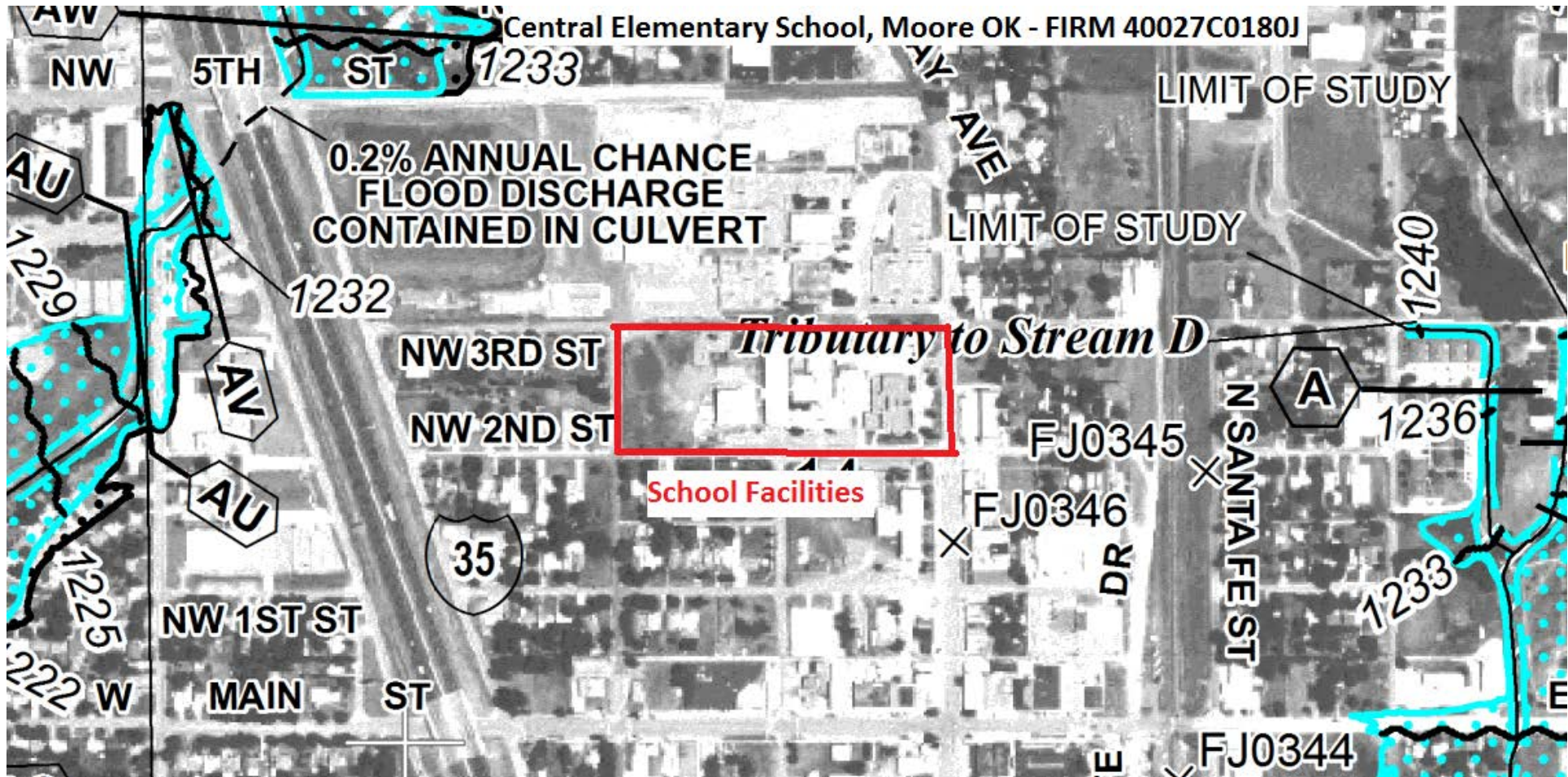


Broadmoore Elementary School, Moore OK - FIRM 40027C0190J

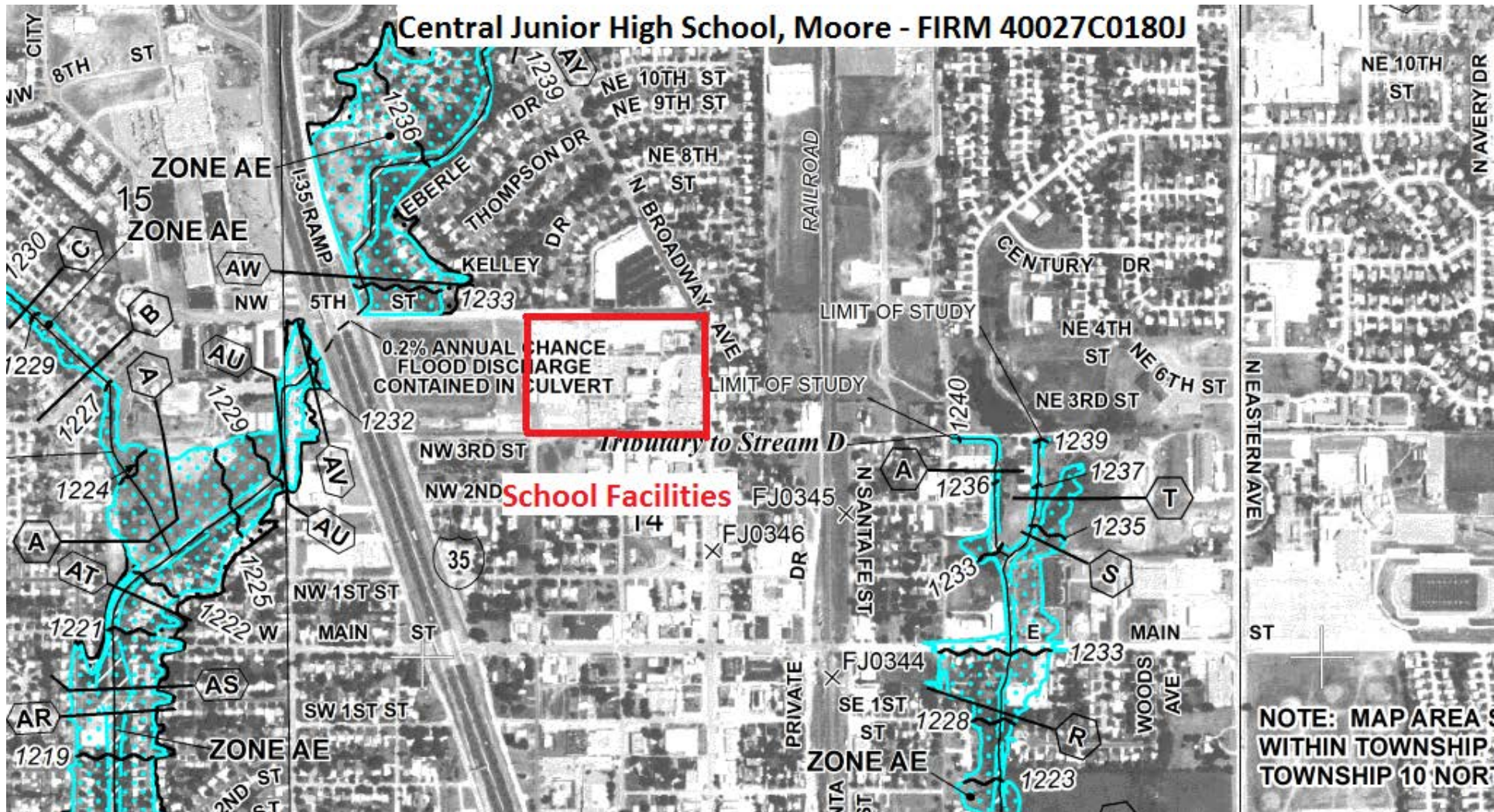


# Bryant Elementary School, Moore OK - FIRM 40027C0180J



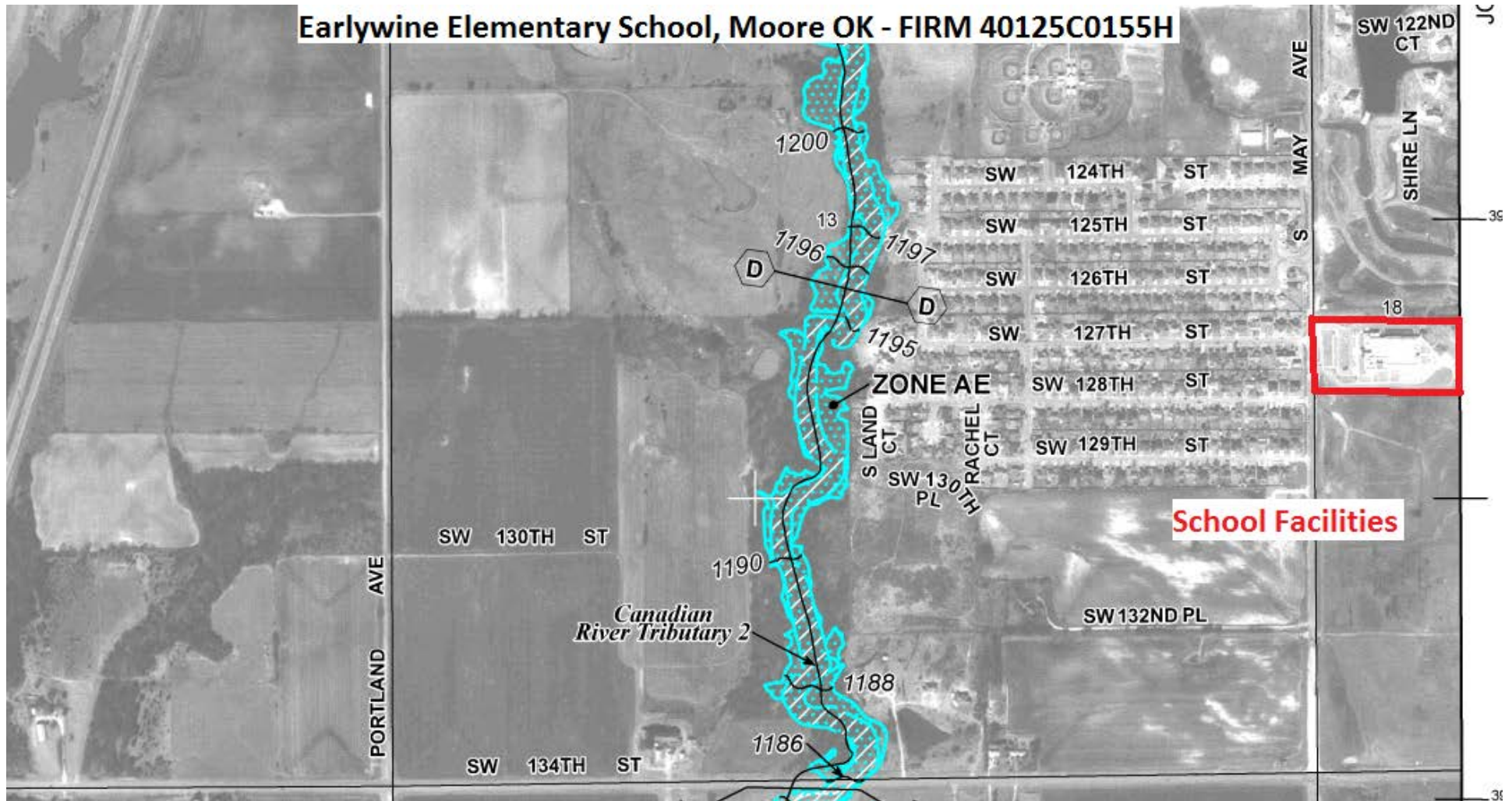


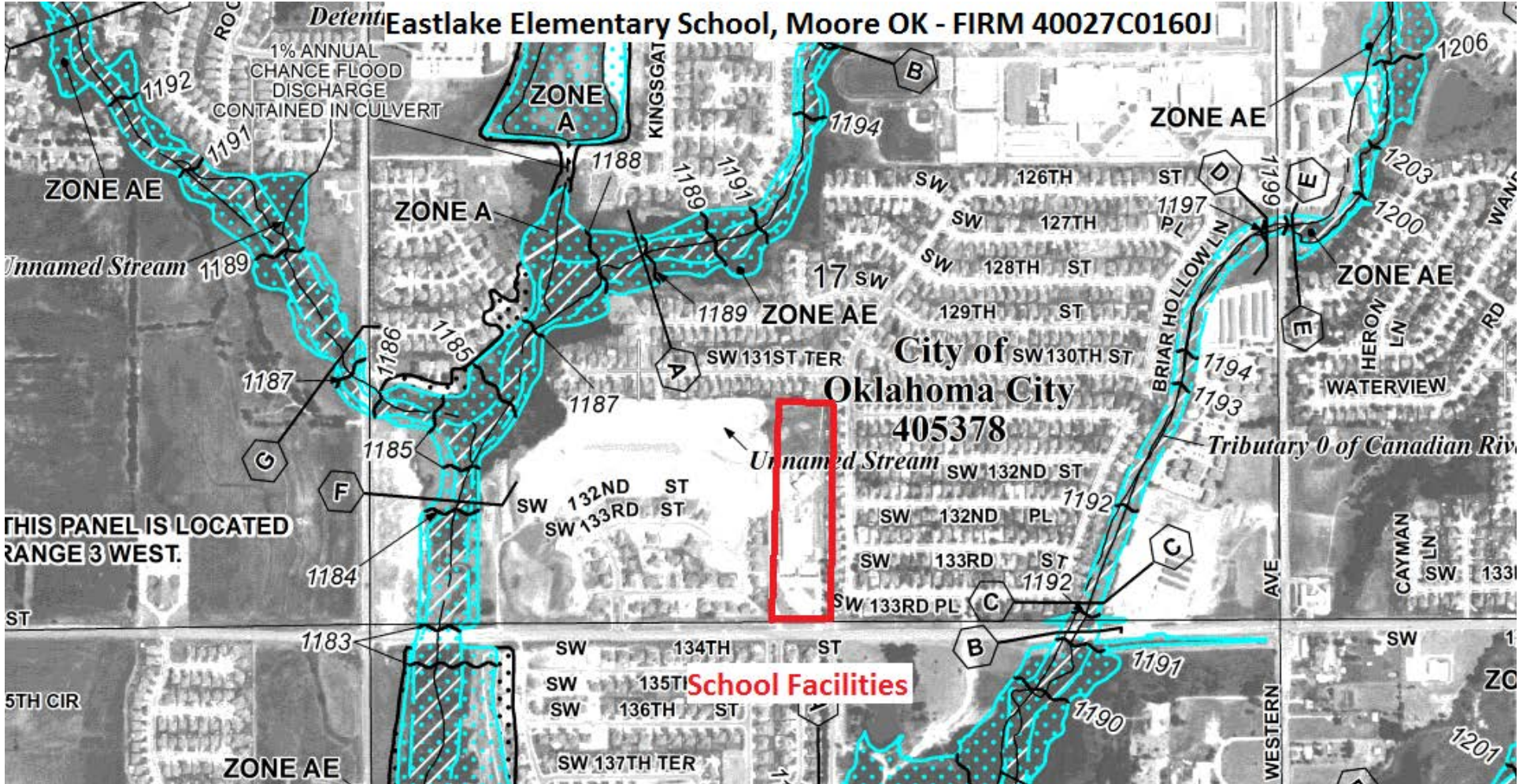
# Central Junior High School, Moore - FIRM 40027C0180J



NOTE: MAP AREA:  
WITHIN TOWNSHIP  
TOWNSHIP 10 NOR

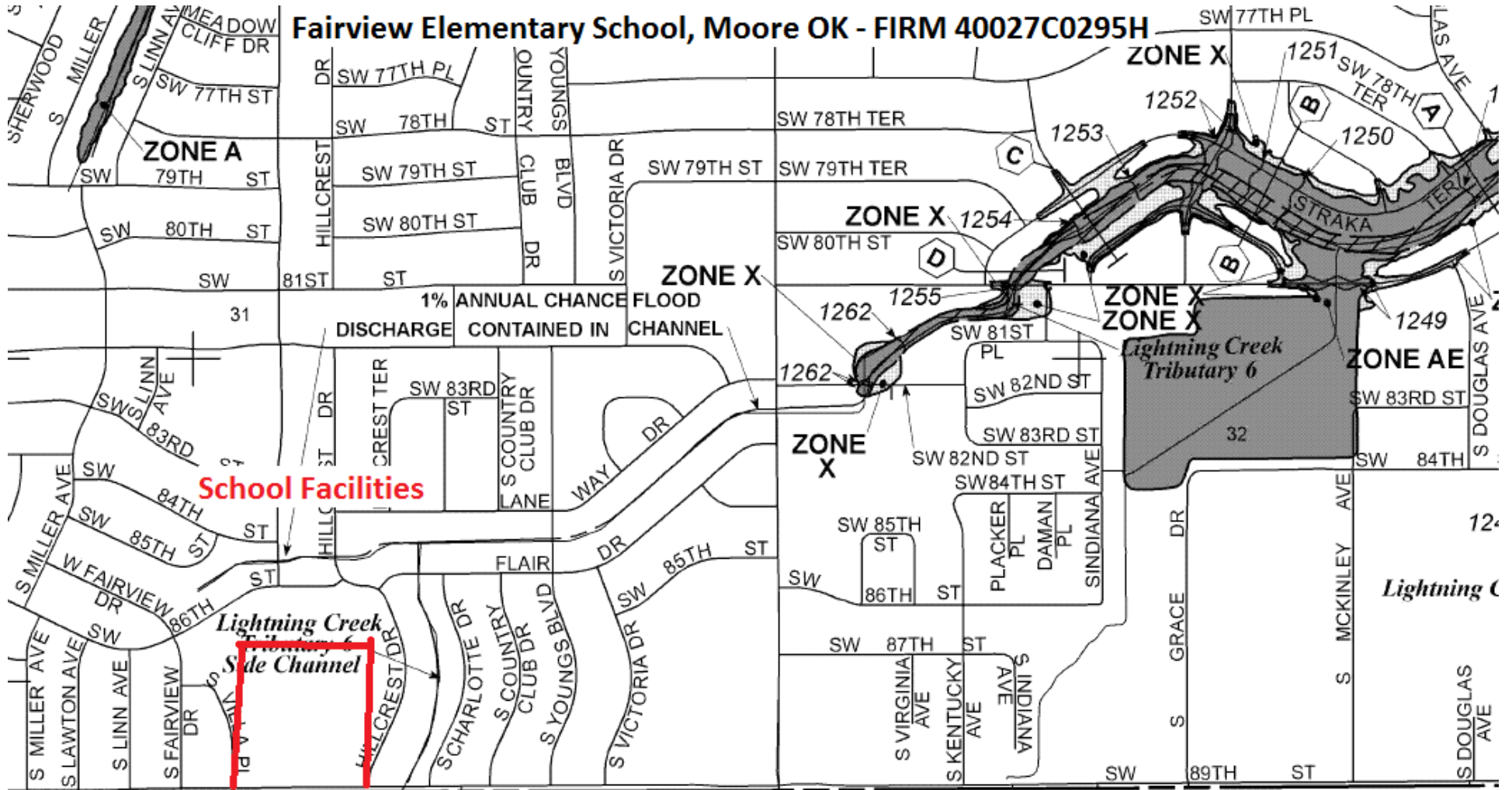
# Earlywine Elementary School, Moore OK - FIRM 40125C0155H



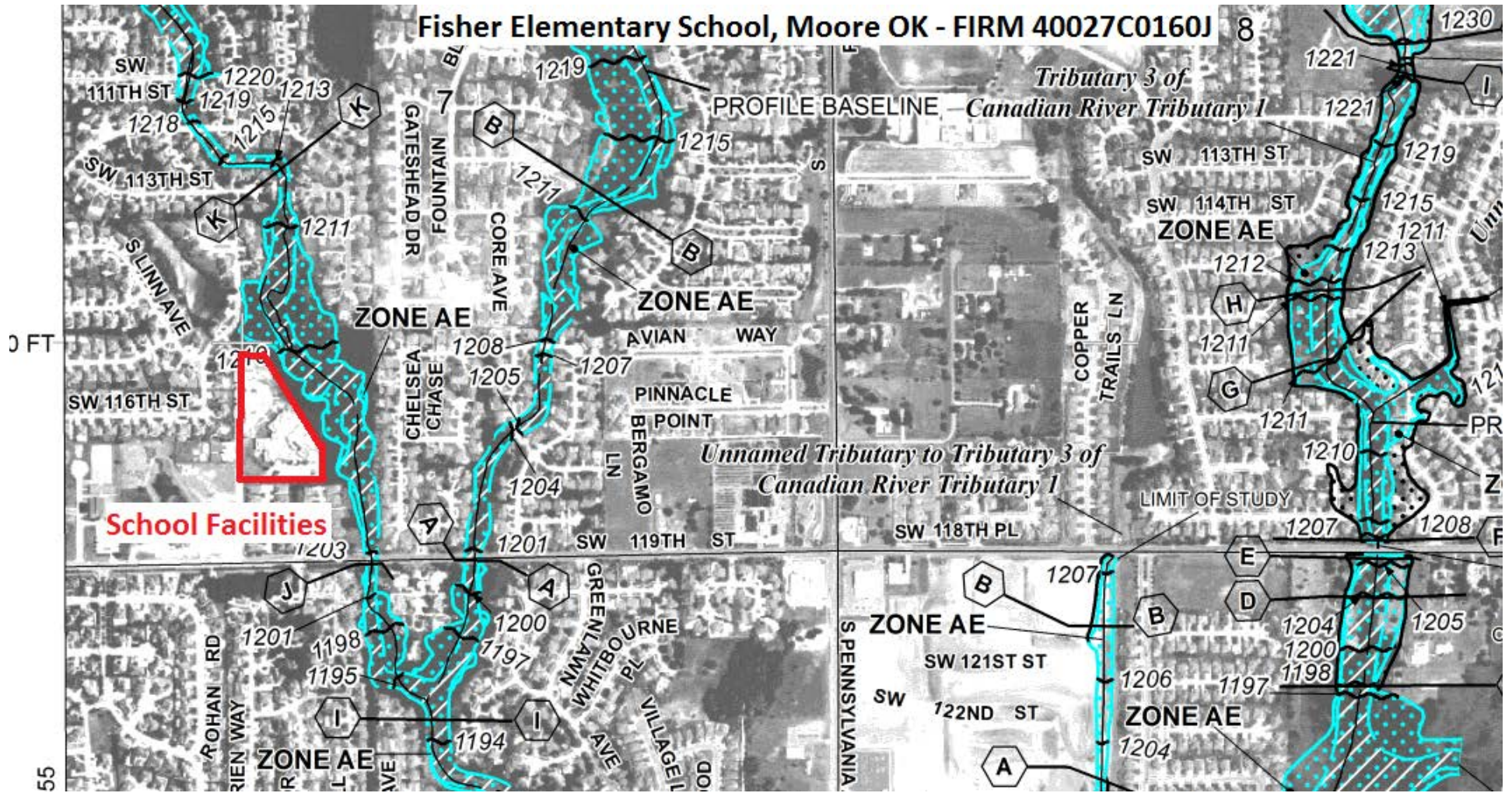




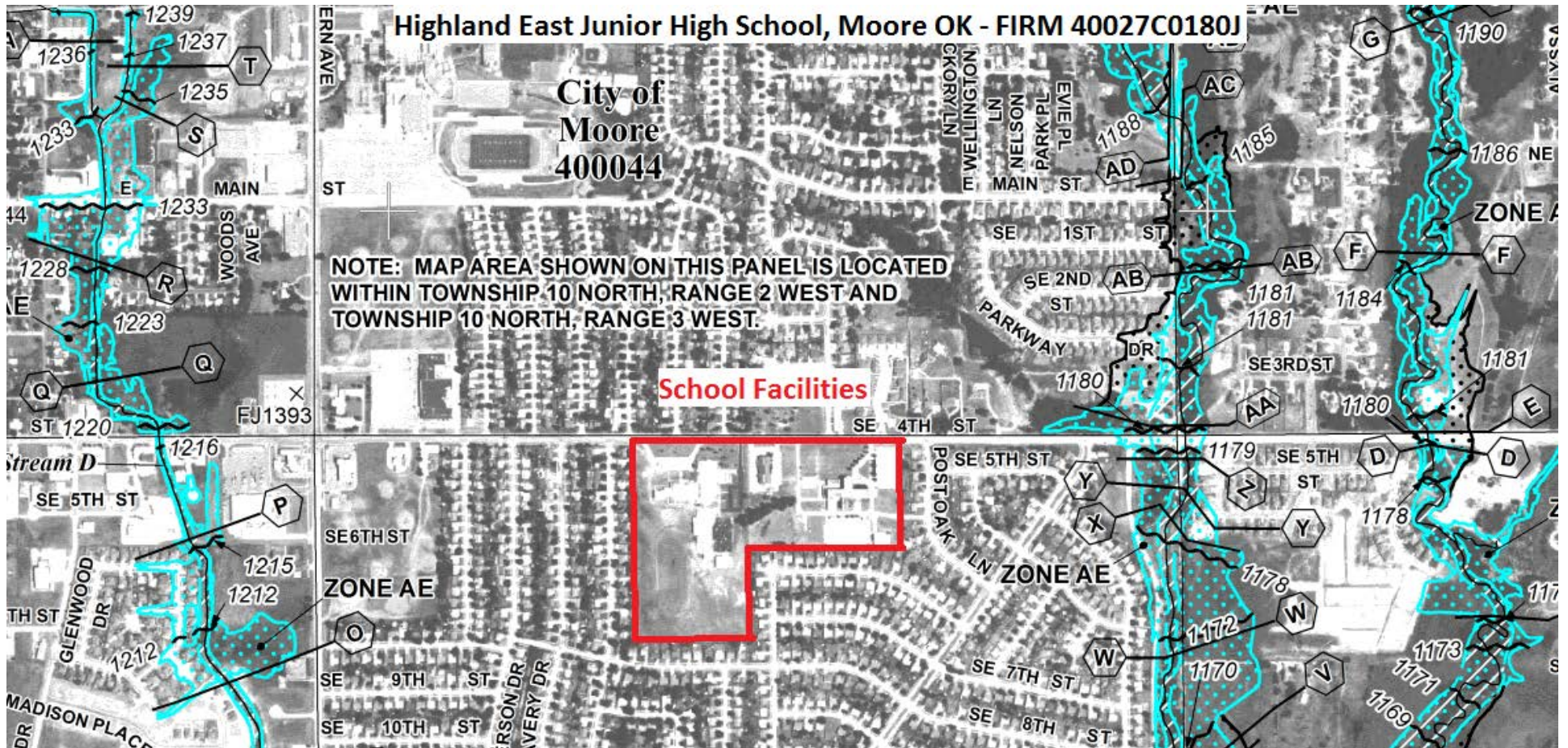
# Fairview Elementary School, Moore OK - FIRM 40027C0295H



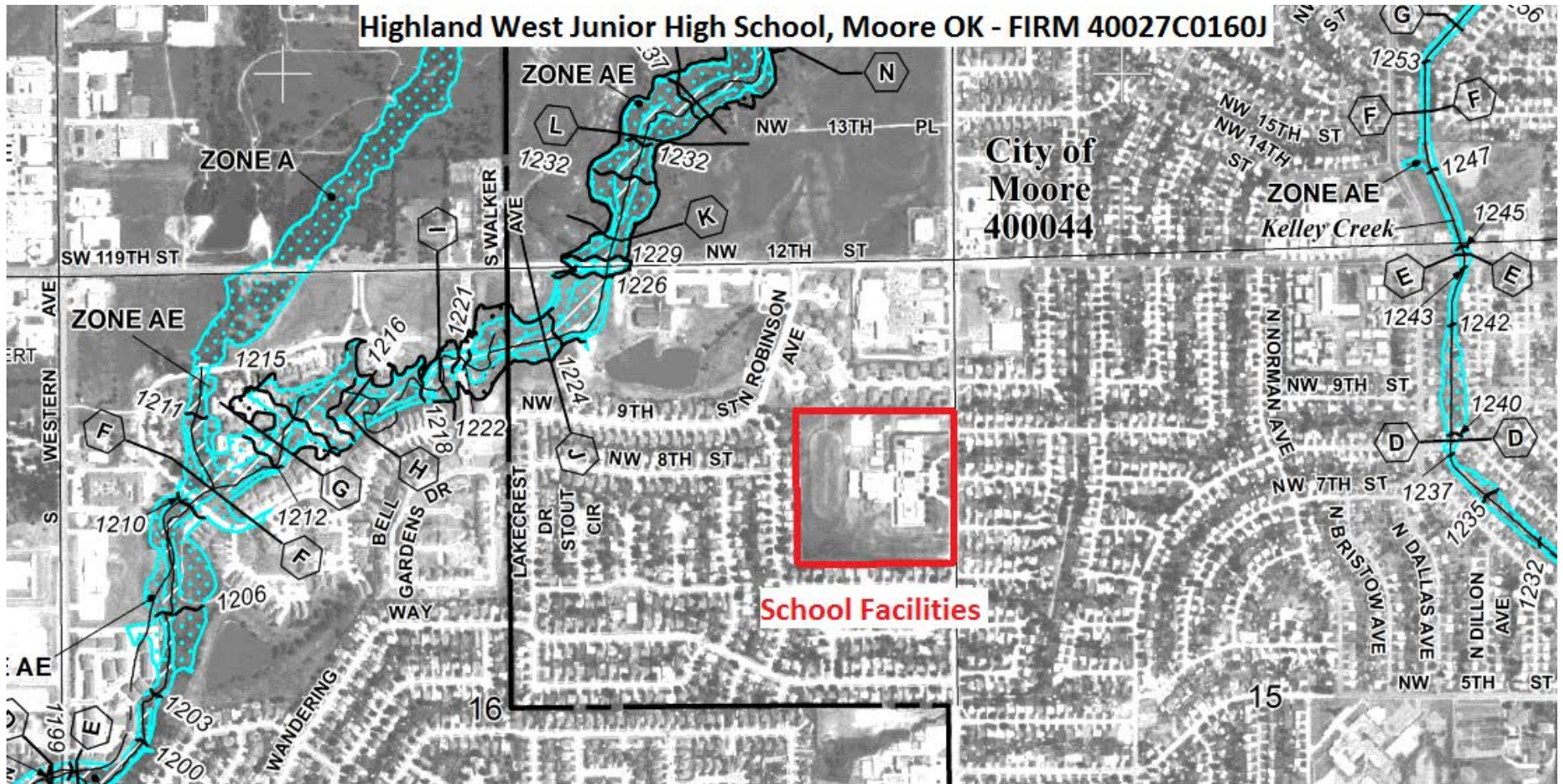
Fisher Elementary School, Moore OK - FIRM 40027C0160J 8

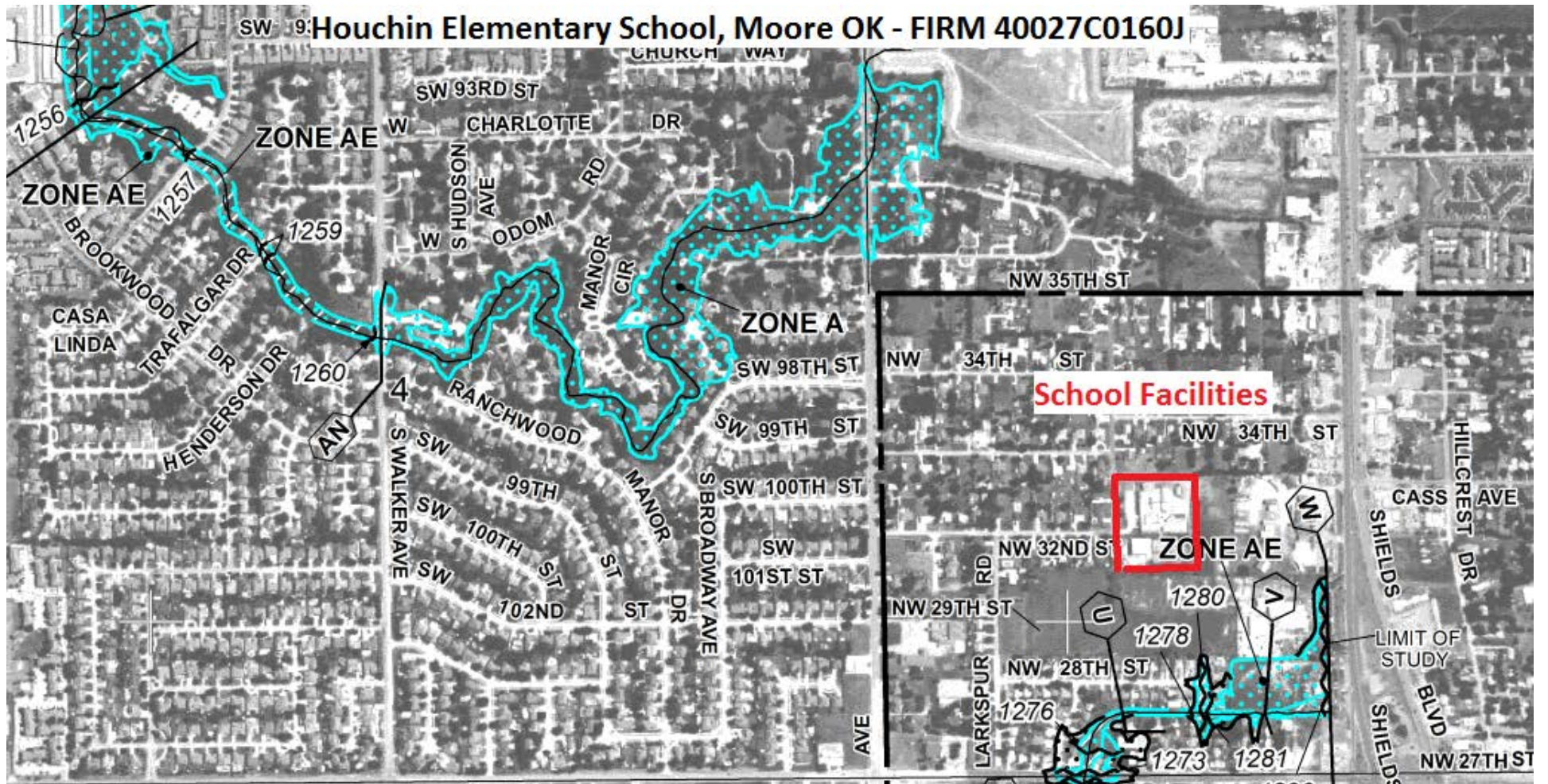


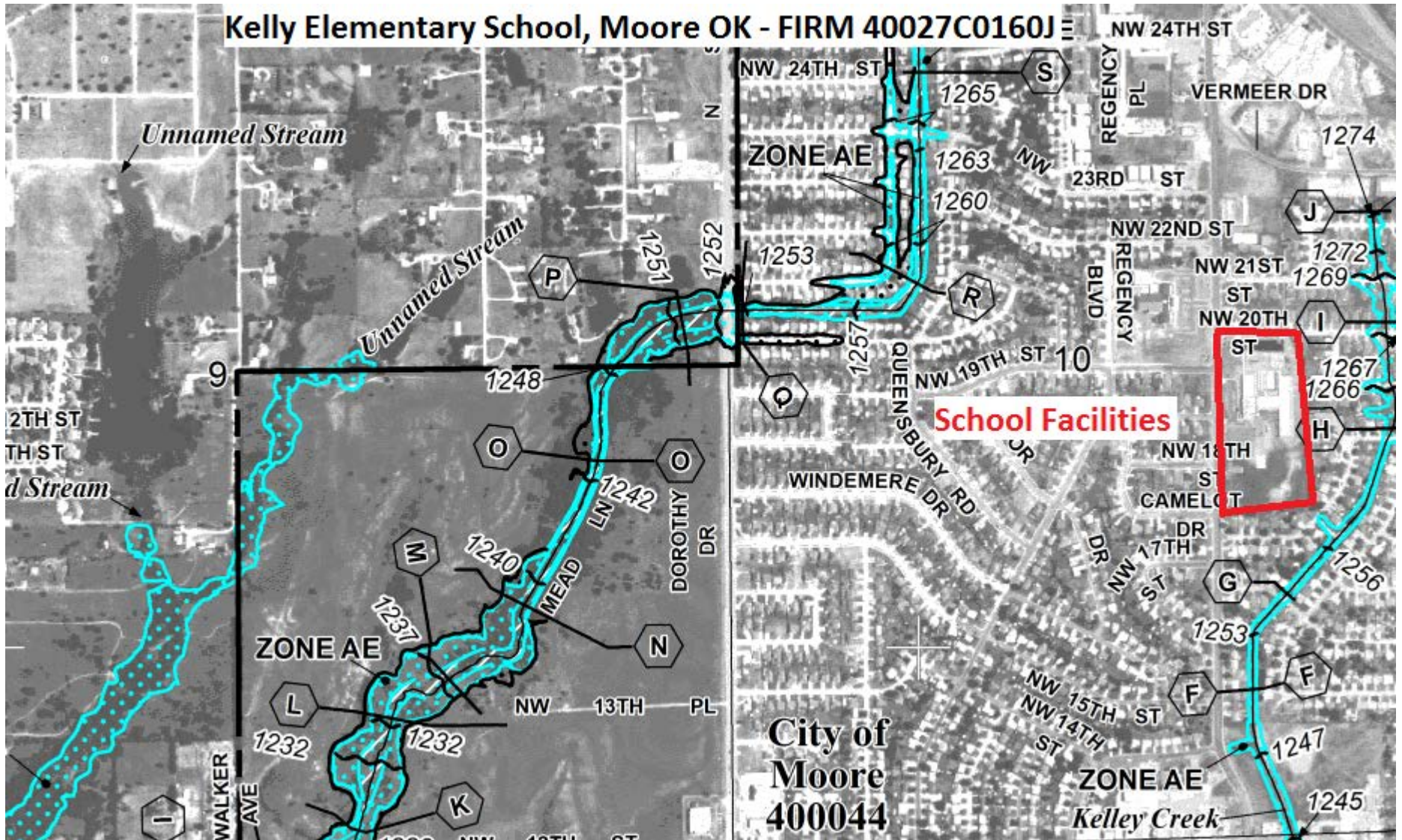




Highland West Junior High School, Moore OK - FIRM 40027C0160J



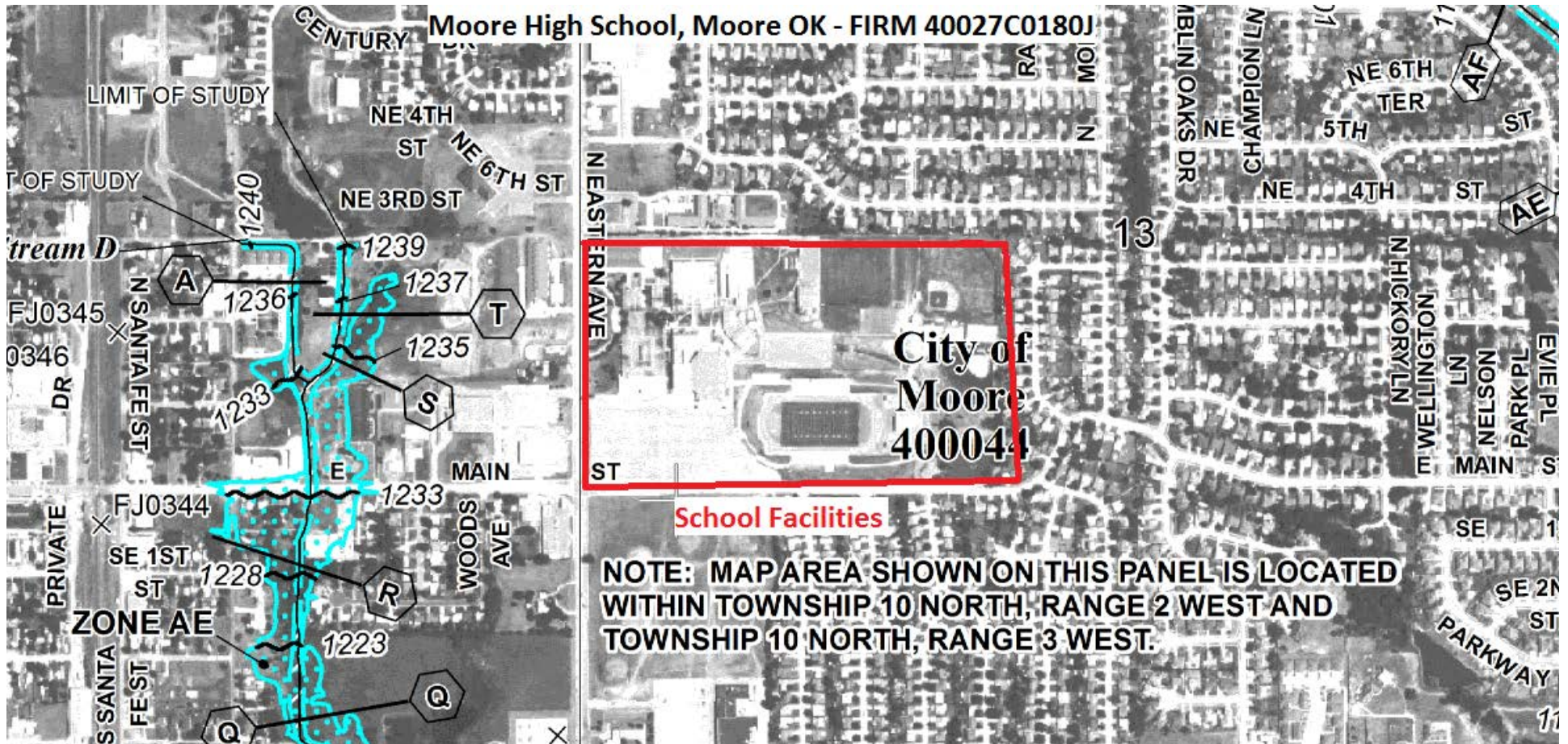




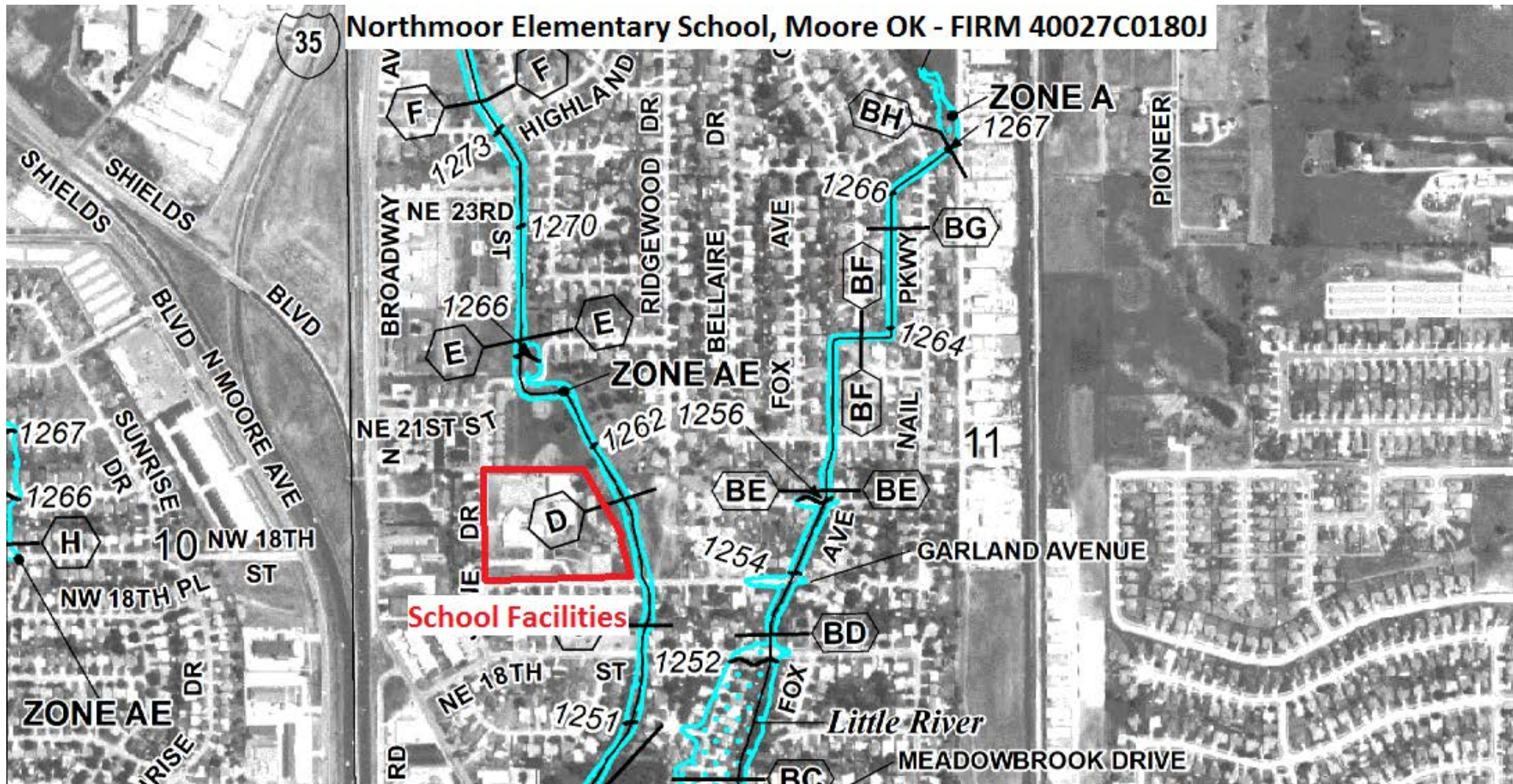
Kingsgate Elementary School, Moore OK - FIRM 40027C0160J

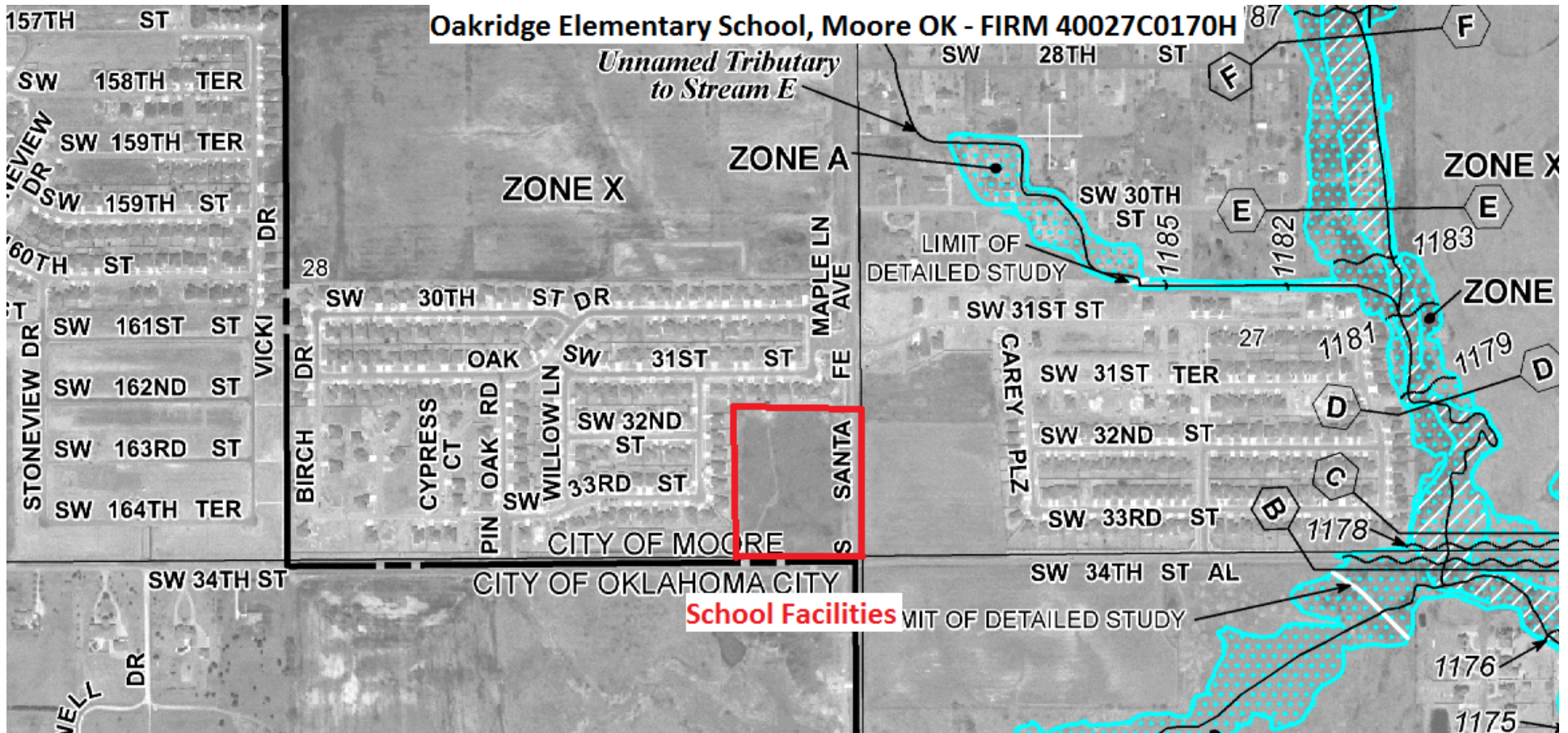


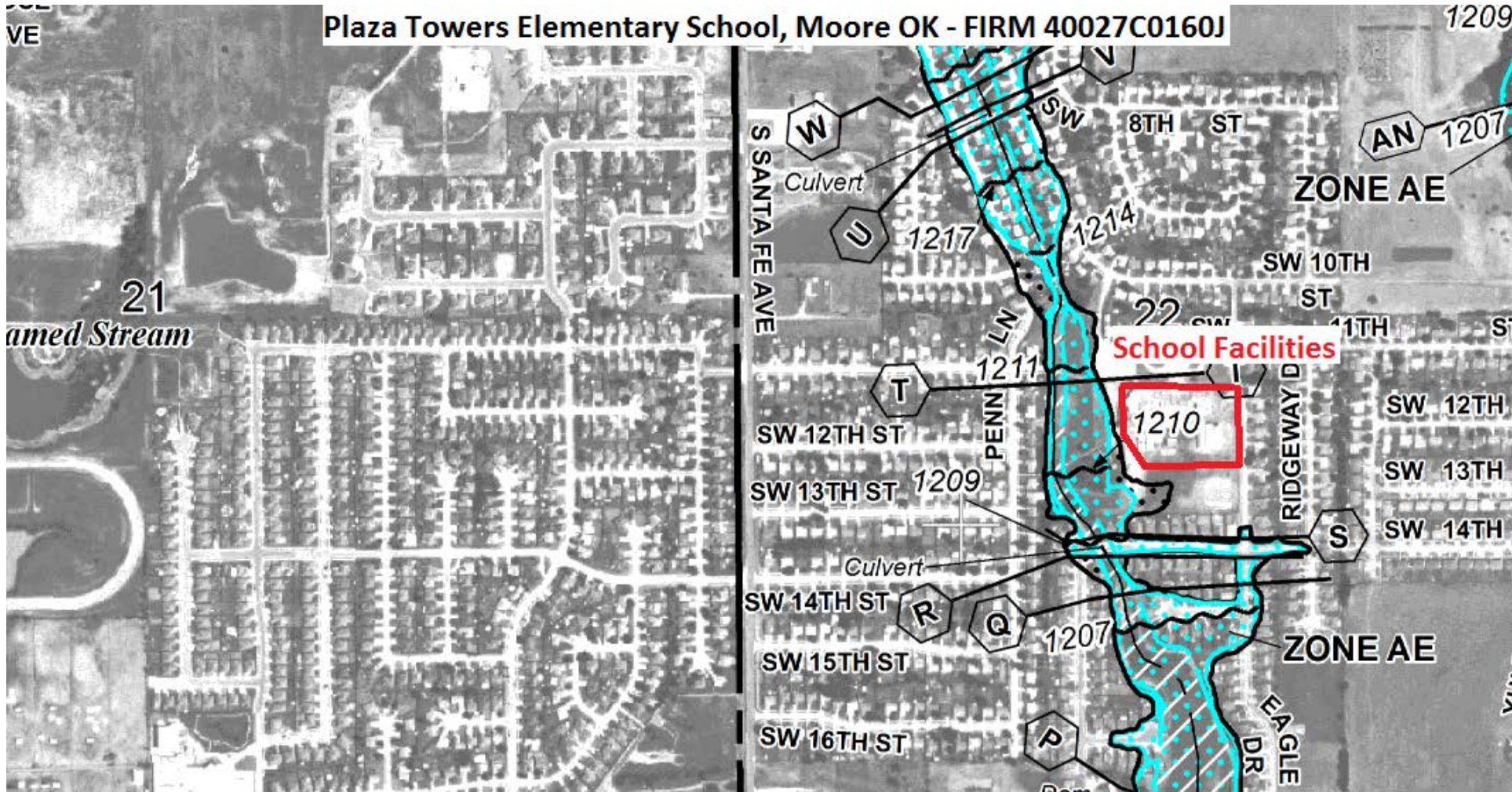


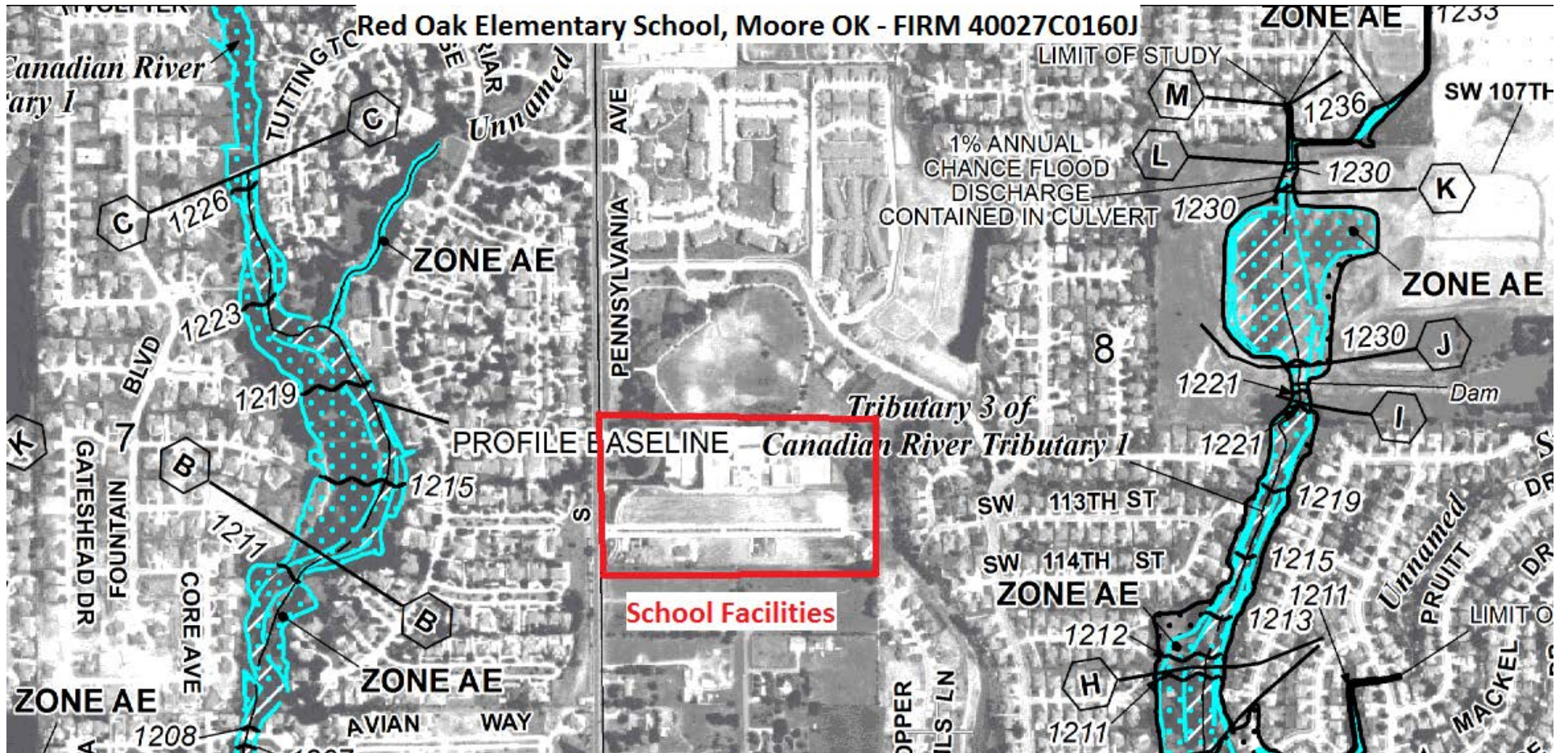


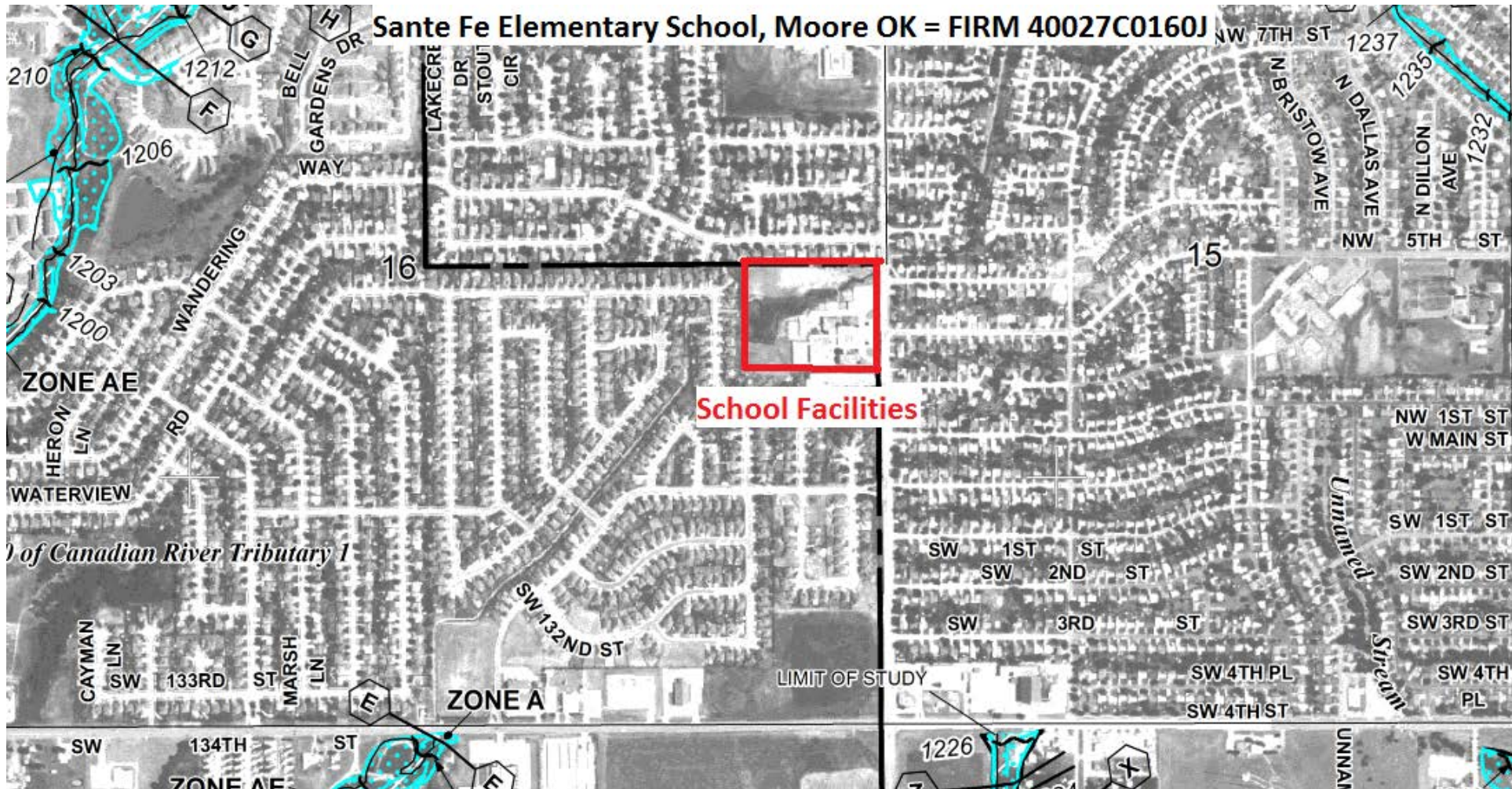




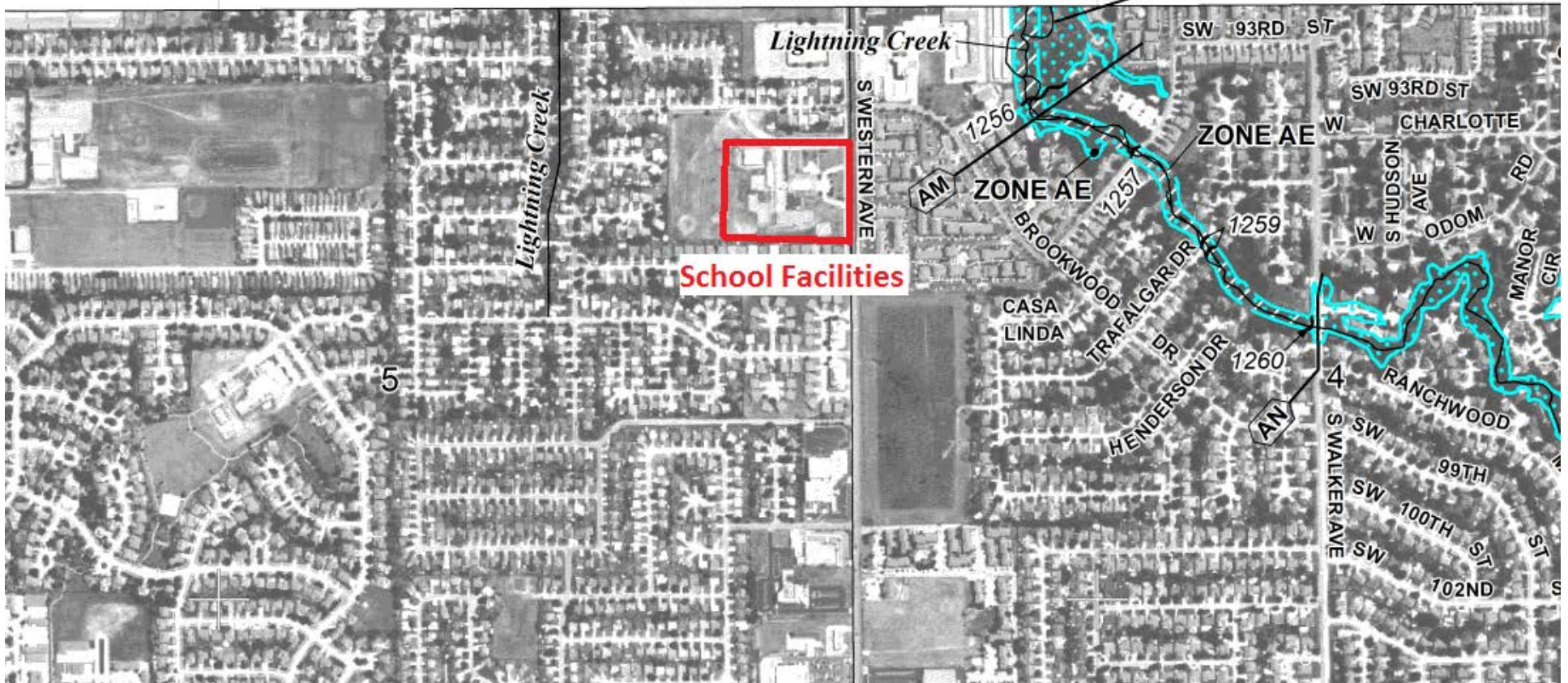






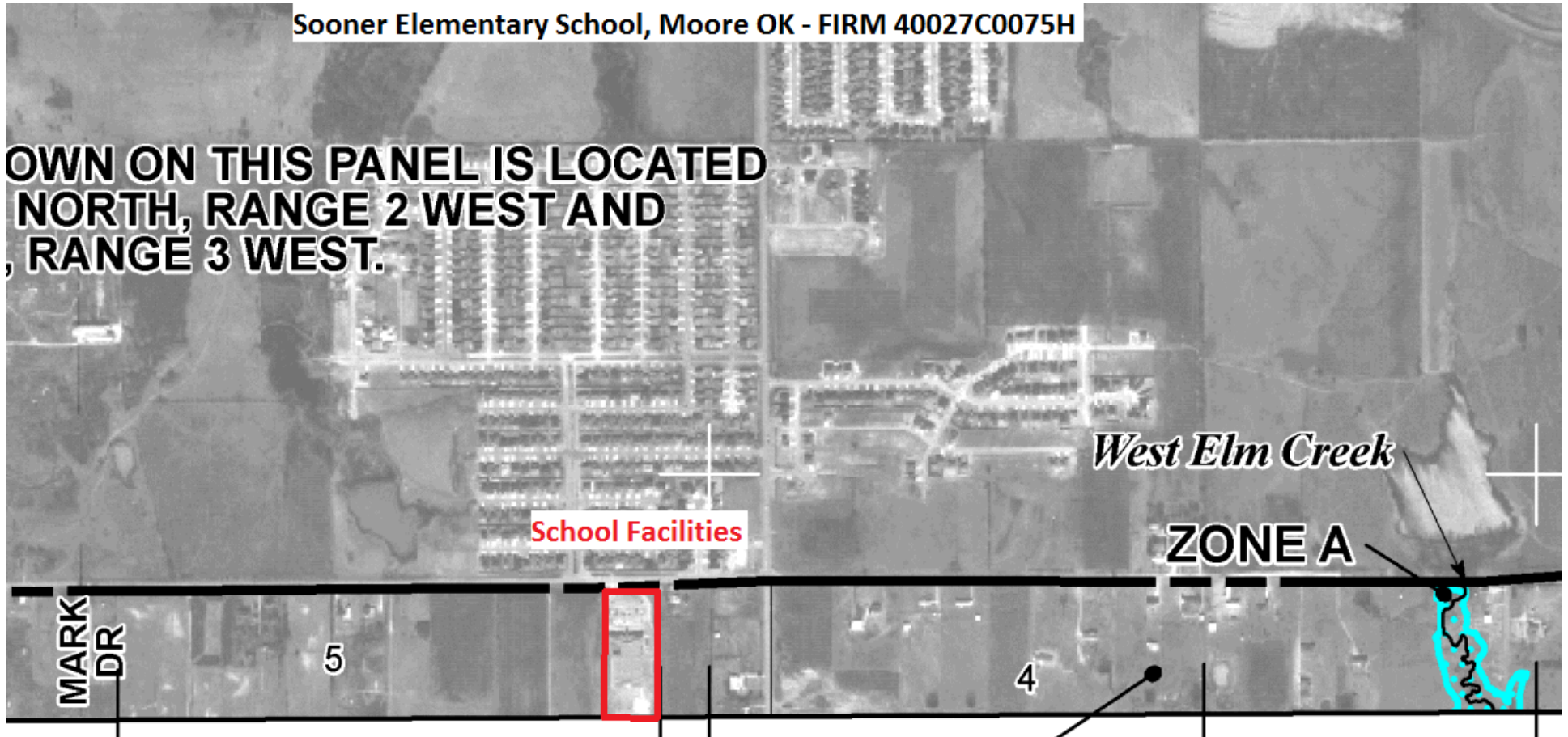


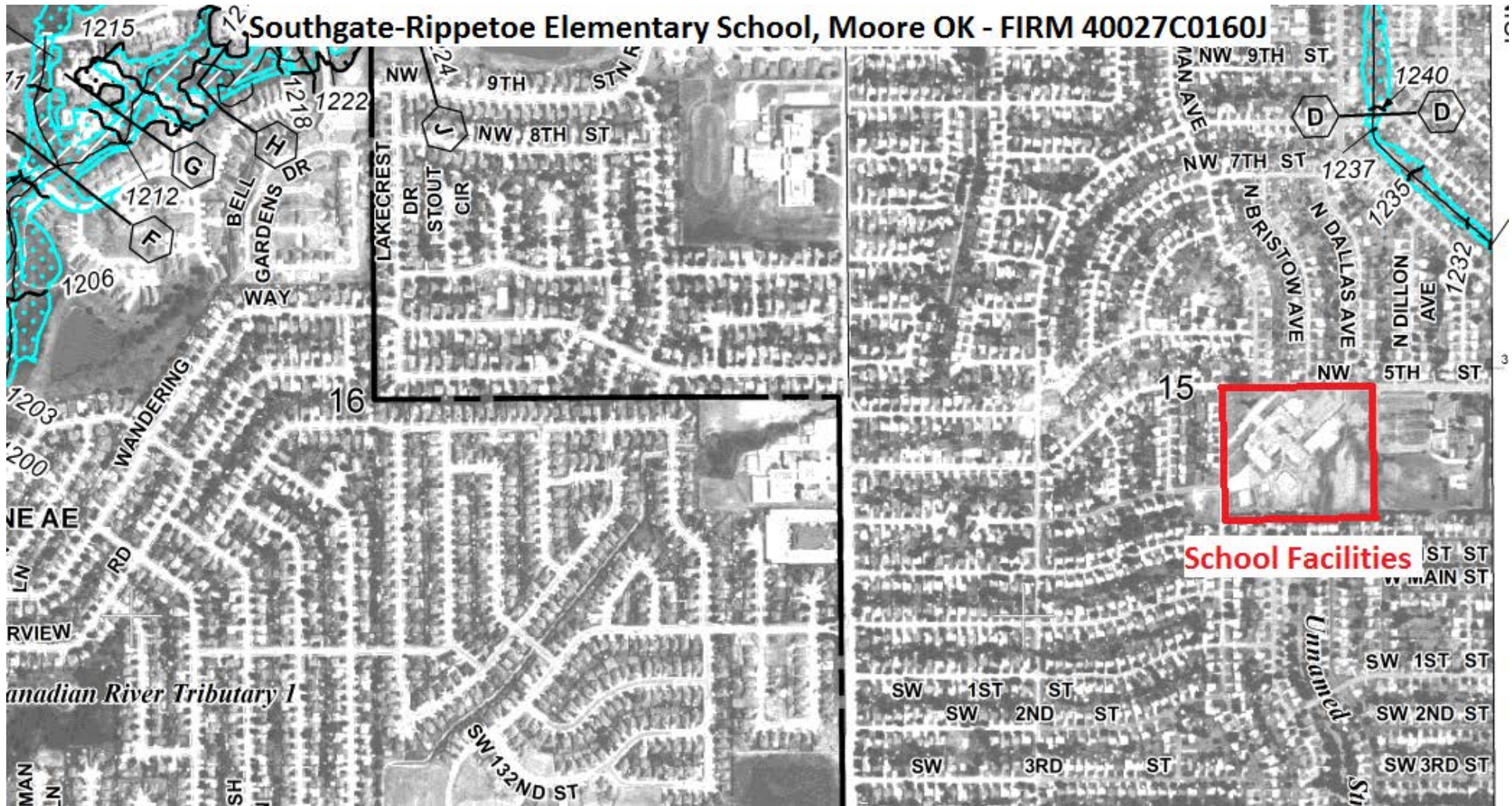
# Sky Ranch Elementary School, Moore OK - FIRM 40027C0160J





**OWN ON THIS PANEL IS LOCATED  
NORTH, RANGE 2 WEST AND  
, RANGE 3 WEST.**

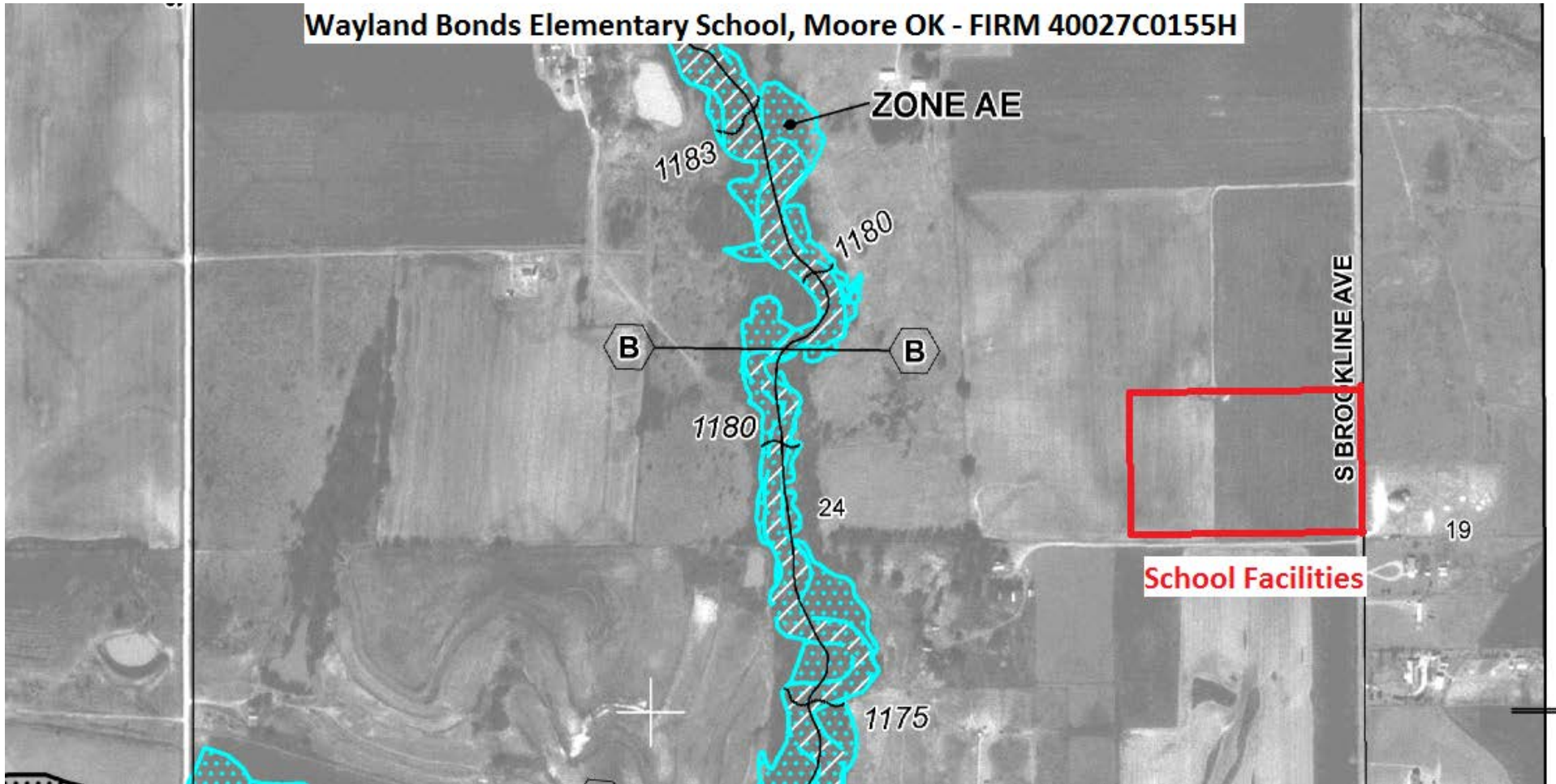




Southmoore High School, Moore OK - FIRM 40027C0170H



Wayland Bonds Elementary School, Moore OK - FIRM 40027C0155H



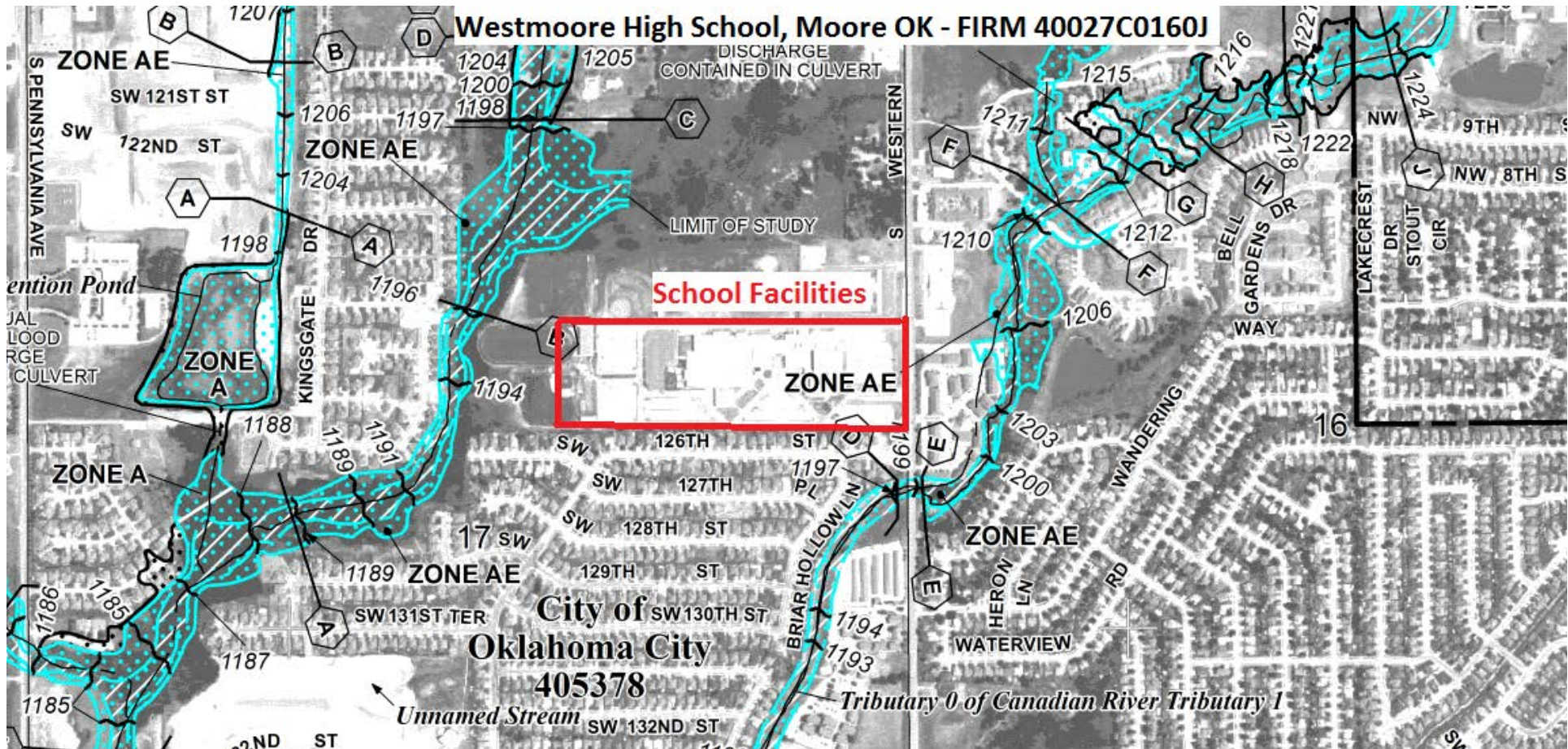
# West Junior High School, Moore OK - FIRM 40027C0160J

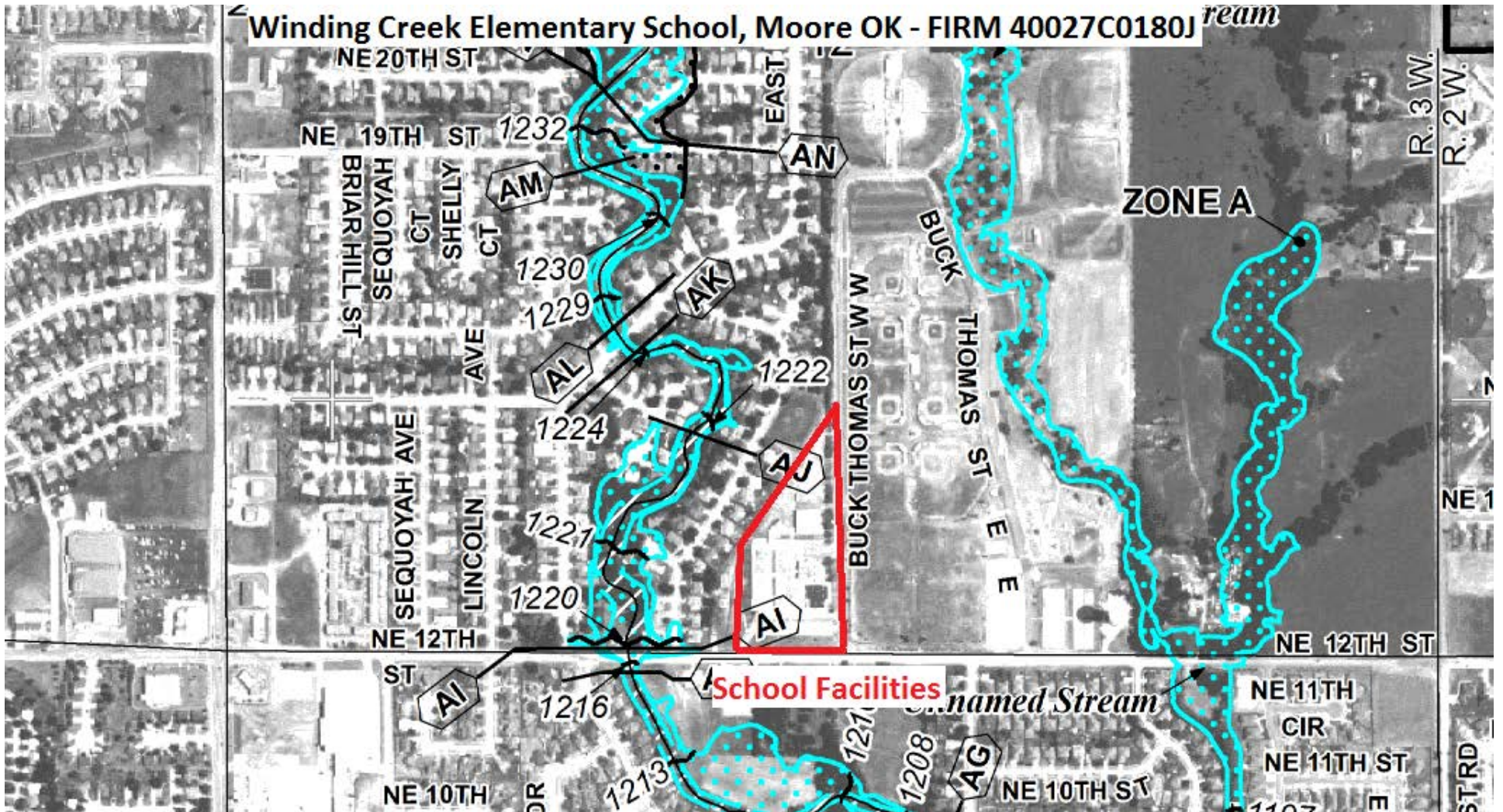
2100000 FT

JOINS PANEL 0050

2110000 FT





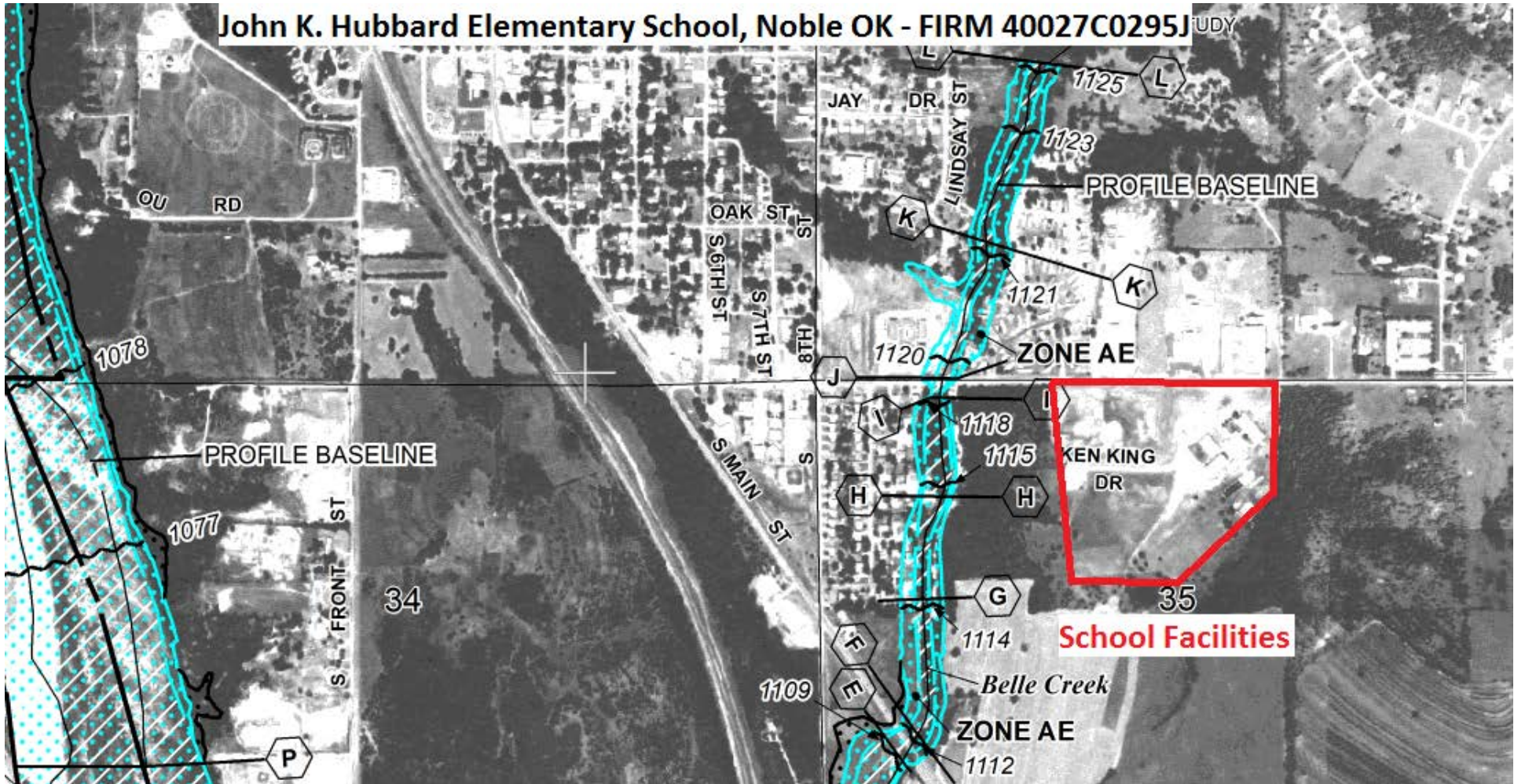


Curtis Inge Middle School, Noble OK - FIRM 40027C0295J





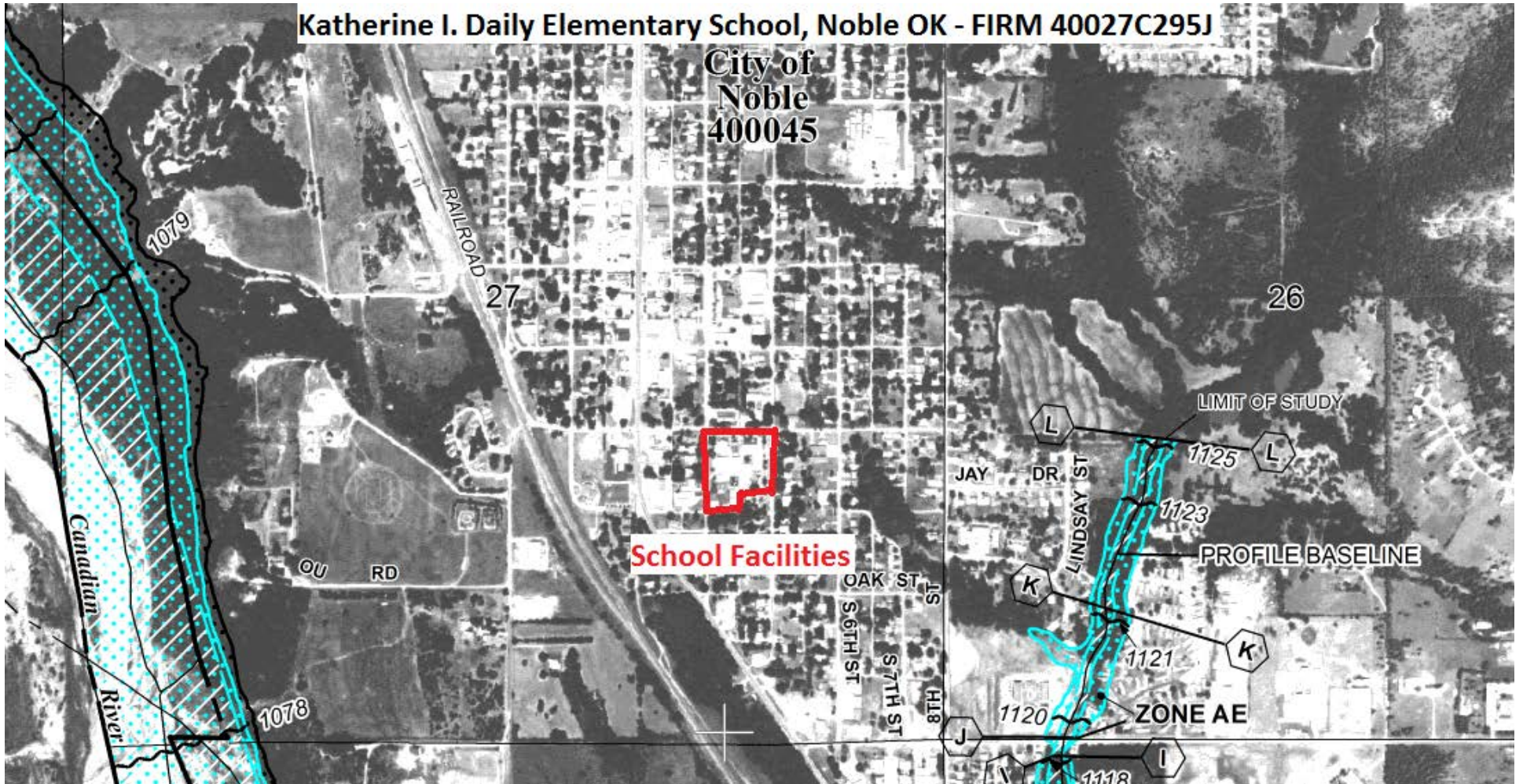
John K. Hubbard Elementary School, Noble OK - FIRM 40027C0295J STUDY



Katherine I. Daily Elementary School, Noble OK - FIRM 40027C295J

City of  
Noble  
400045

School Facilities



Noble High School, Noble OK - FIRM 40027C0315H



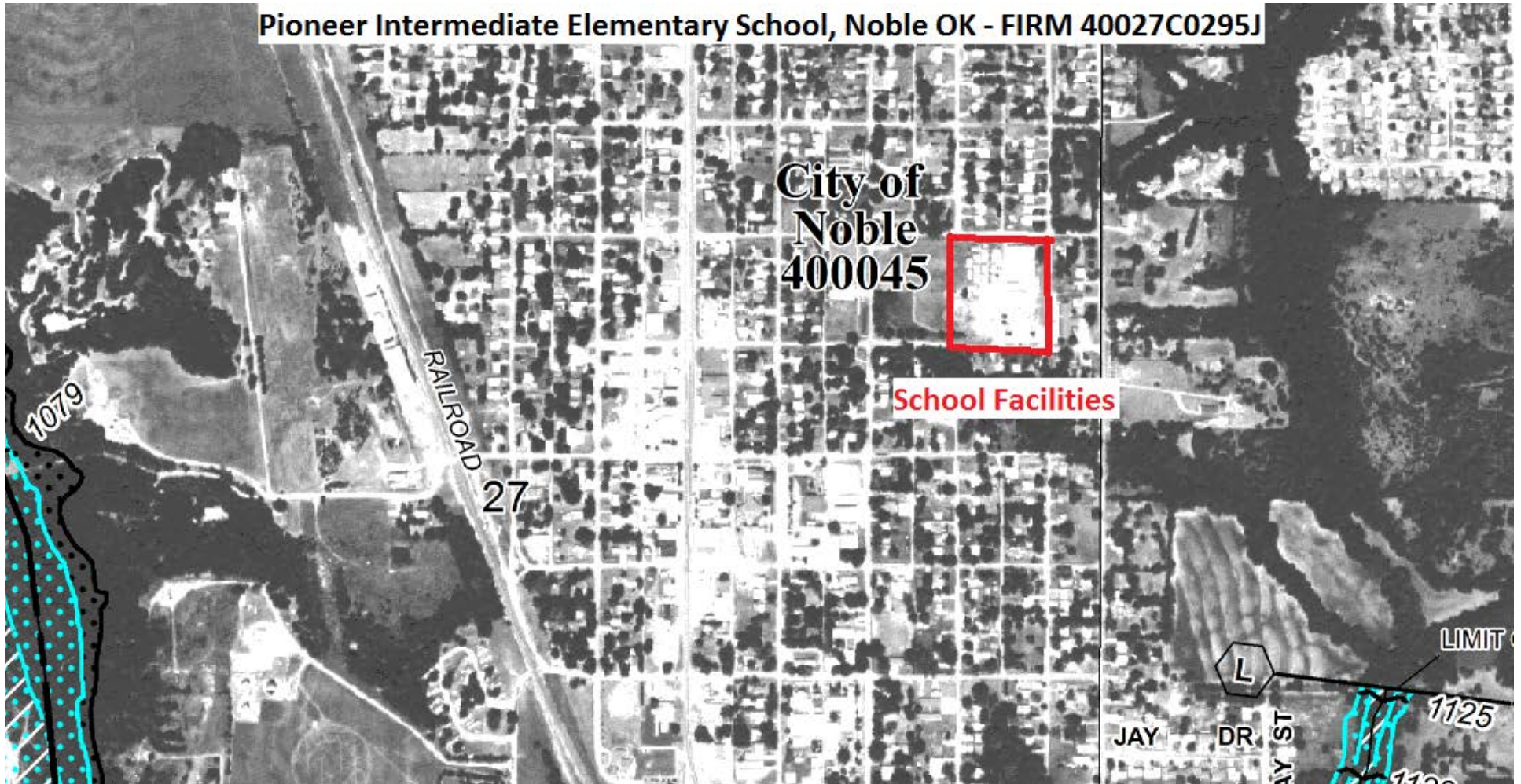
School Facilities

ETOWAH RD

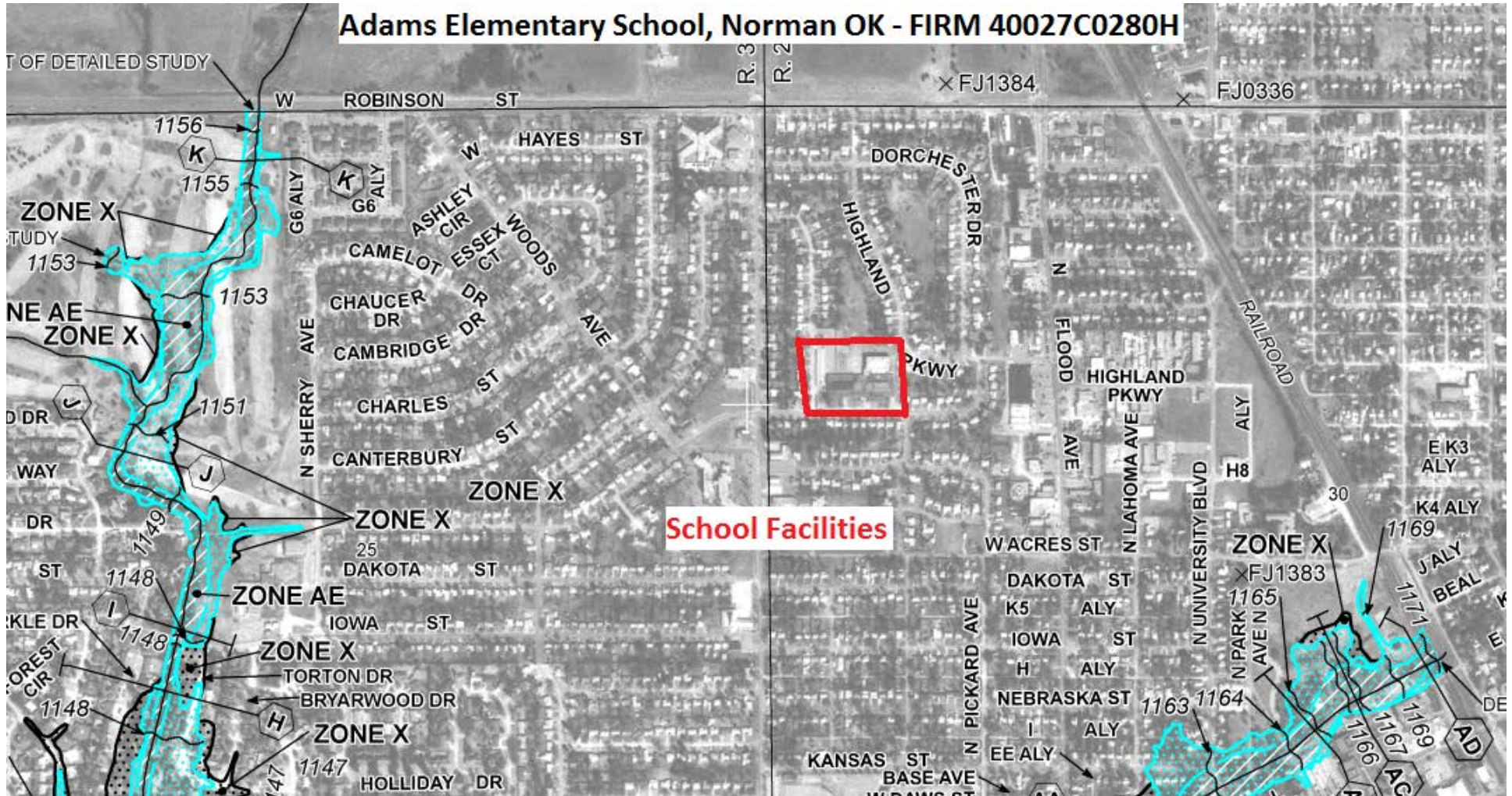
DR

OAKLAWN  
DOWNS  
RD

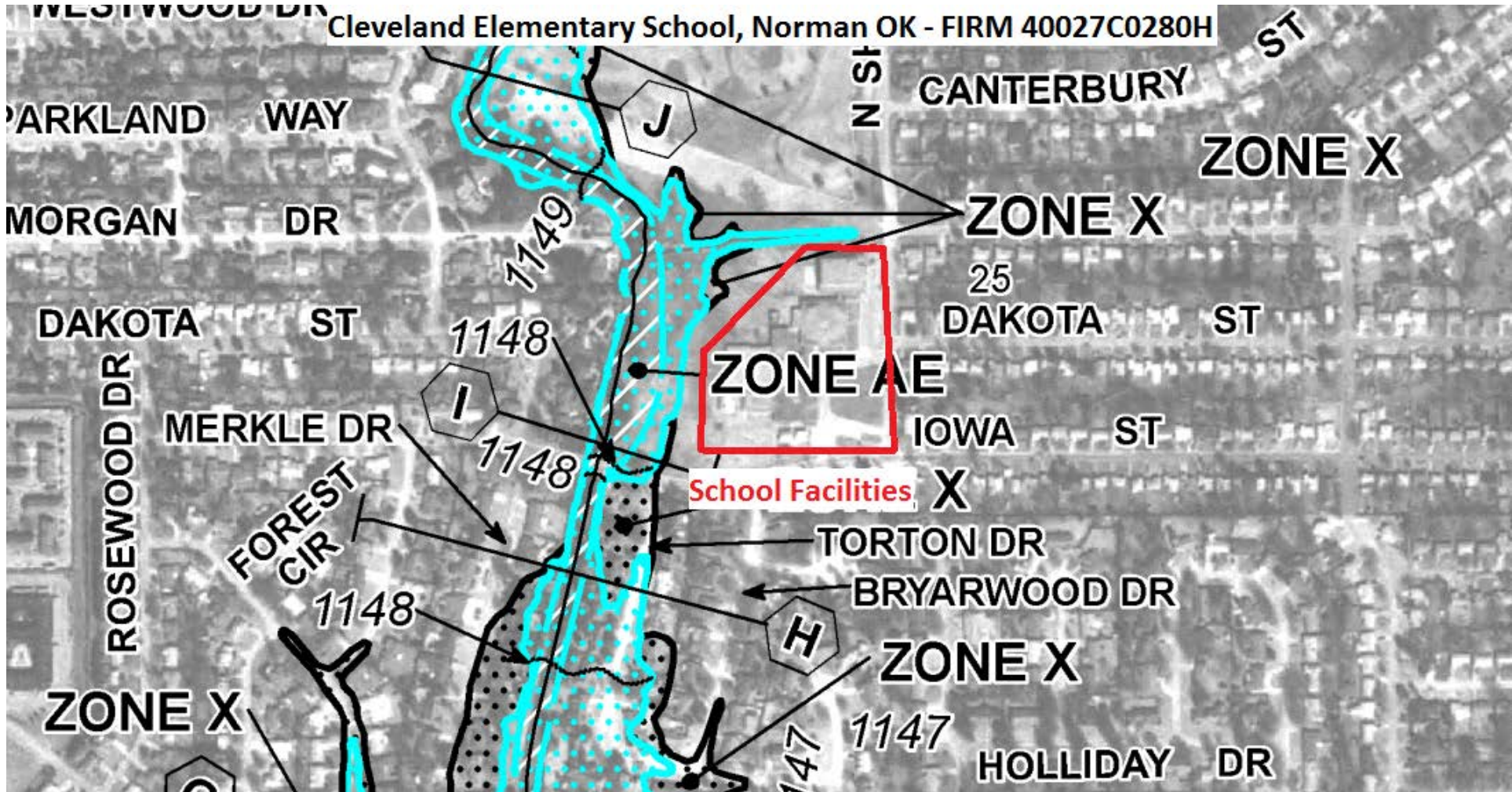
Pioneer Intermediate Elementary School, Noble OK - FIRM 40027C0295J



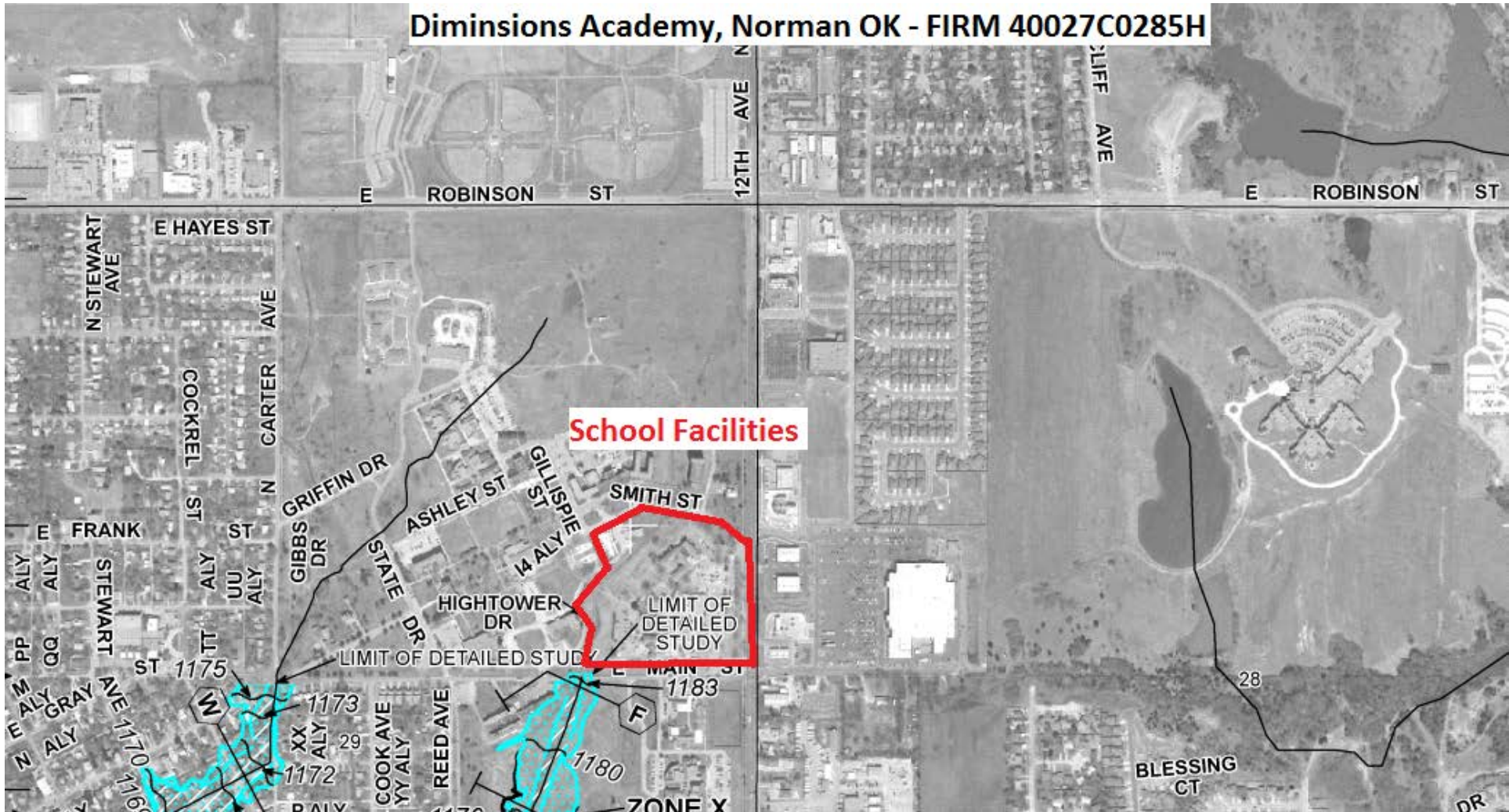
# Adams Elementary School, Norman OK - FIRM 40027C0280H







Diminsions Academy, Norman OK - FIRM 40027C0285H

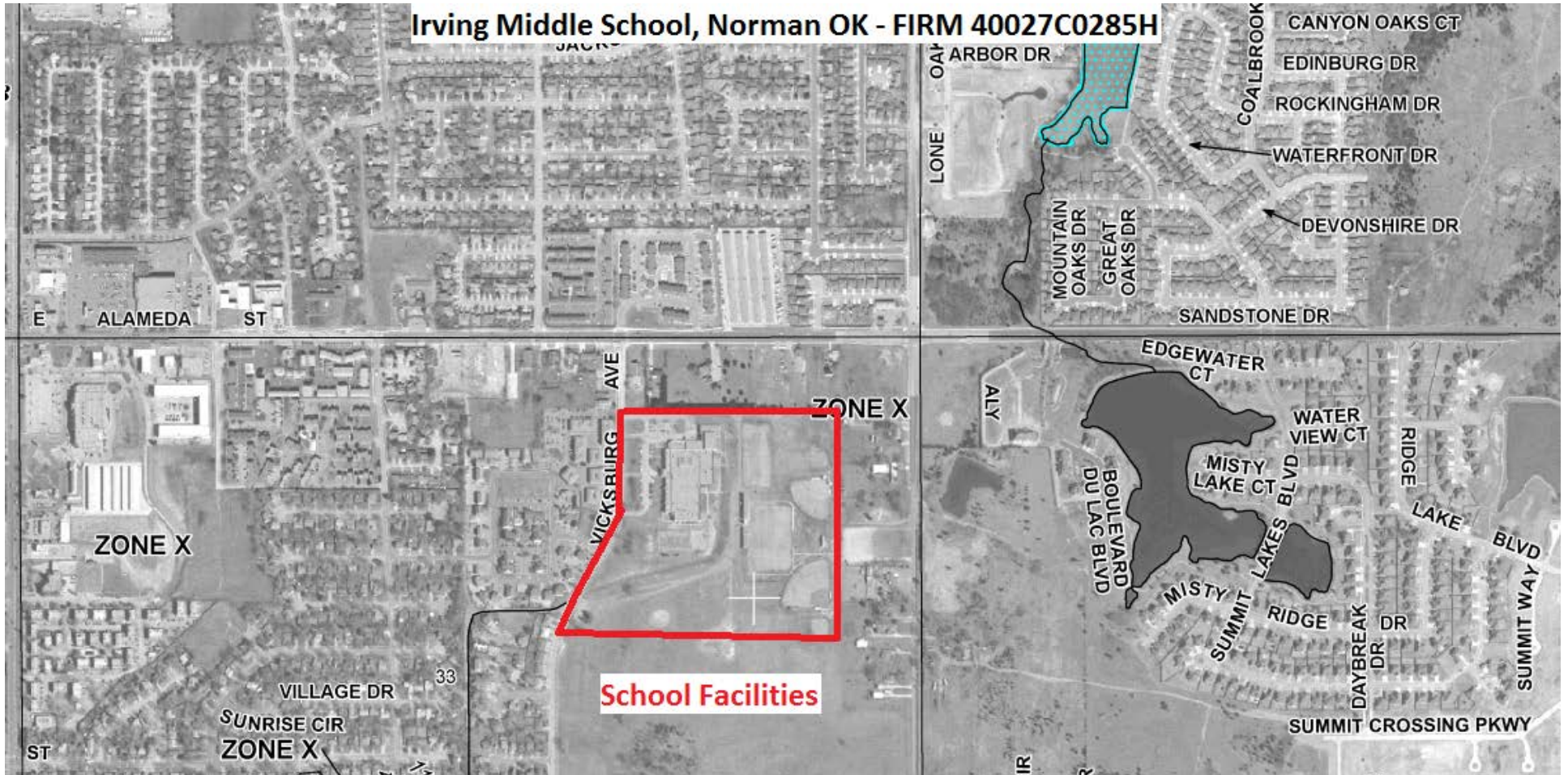




Eisenhower Elementary School, Norman OK - FIRM 40027C0285H

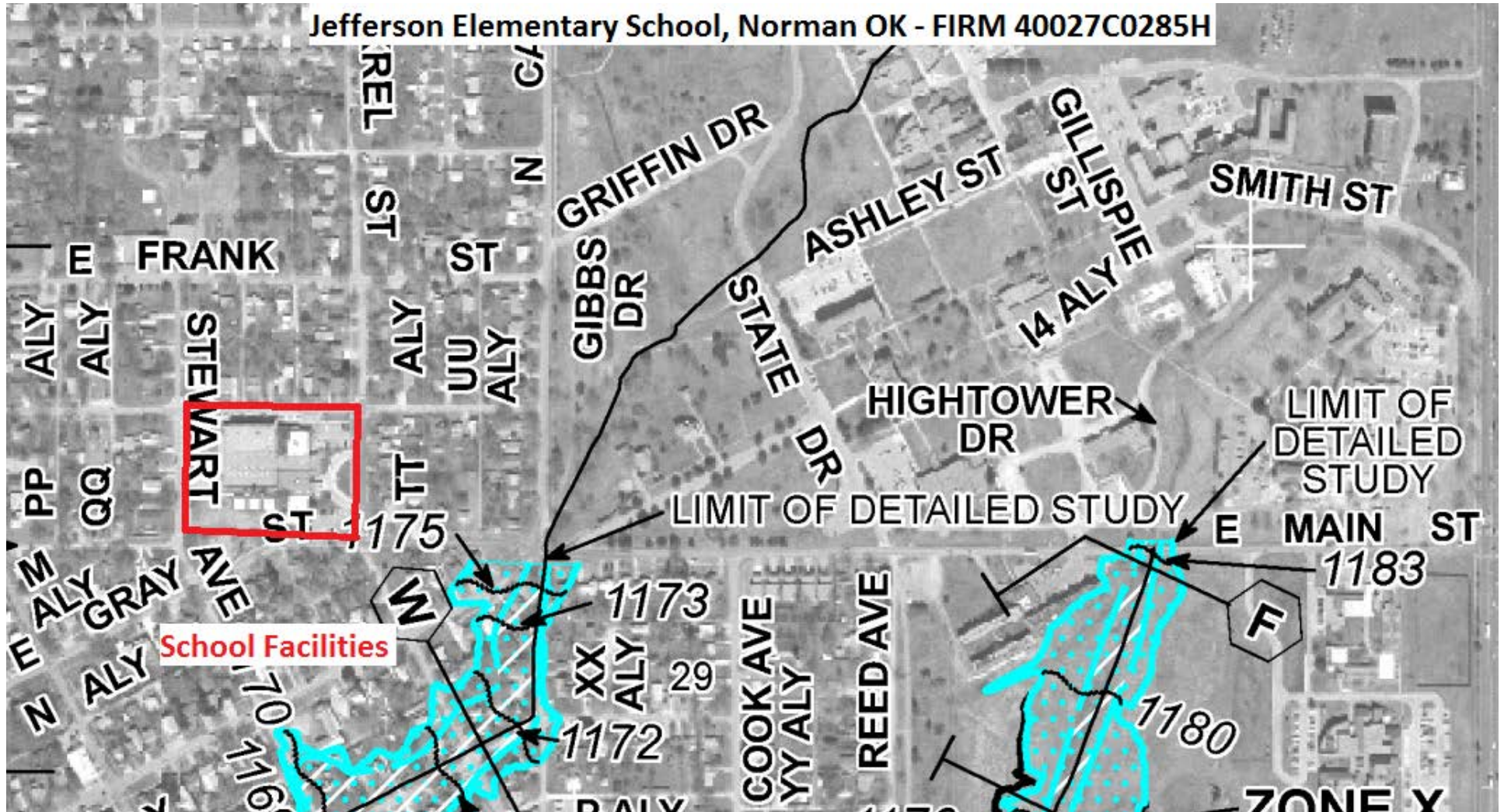


Irving Middle School, Norman OK - FIRM 40027C0285H

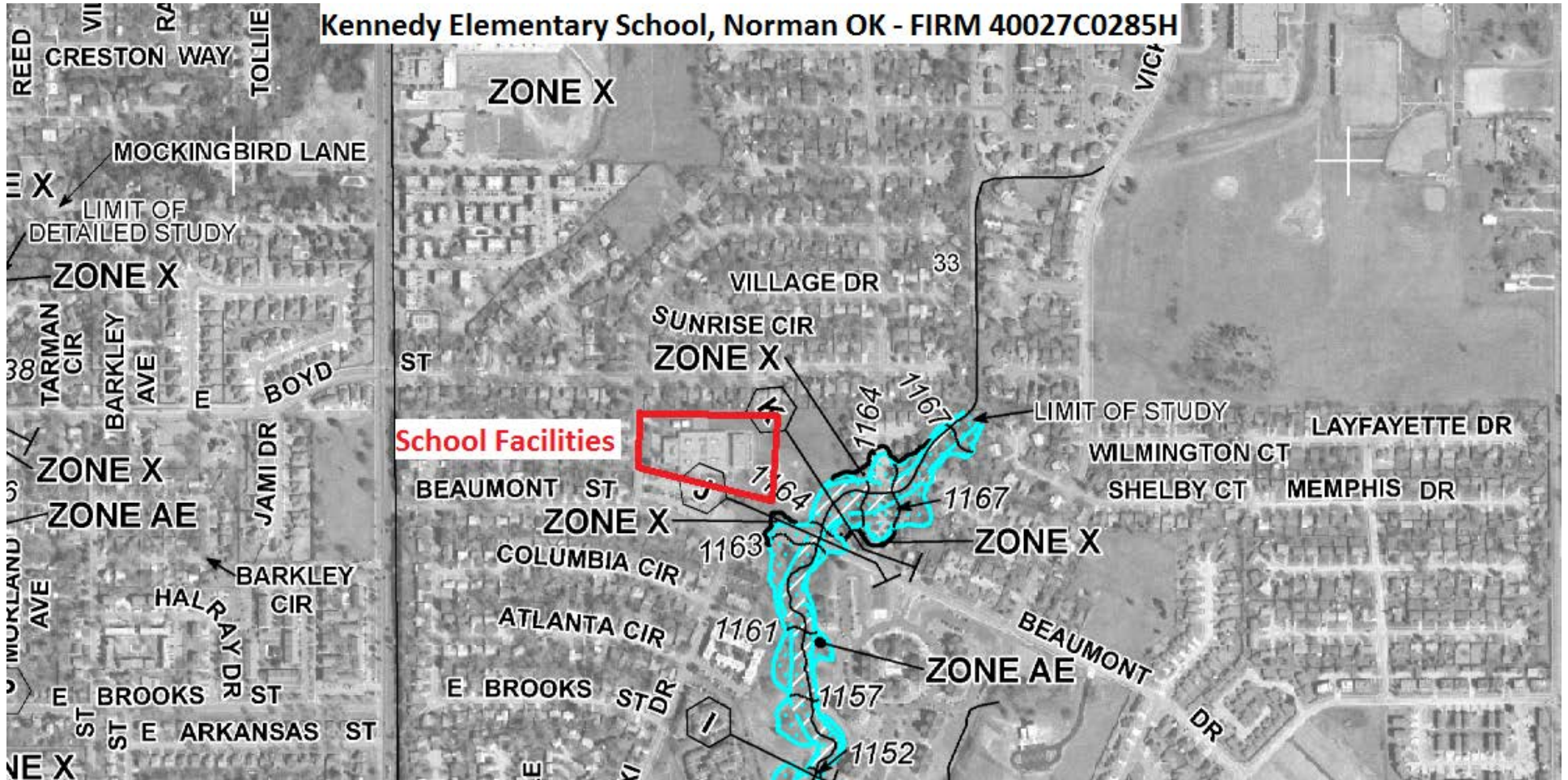




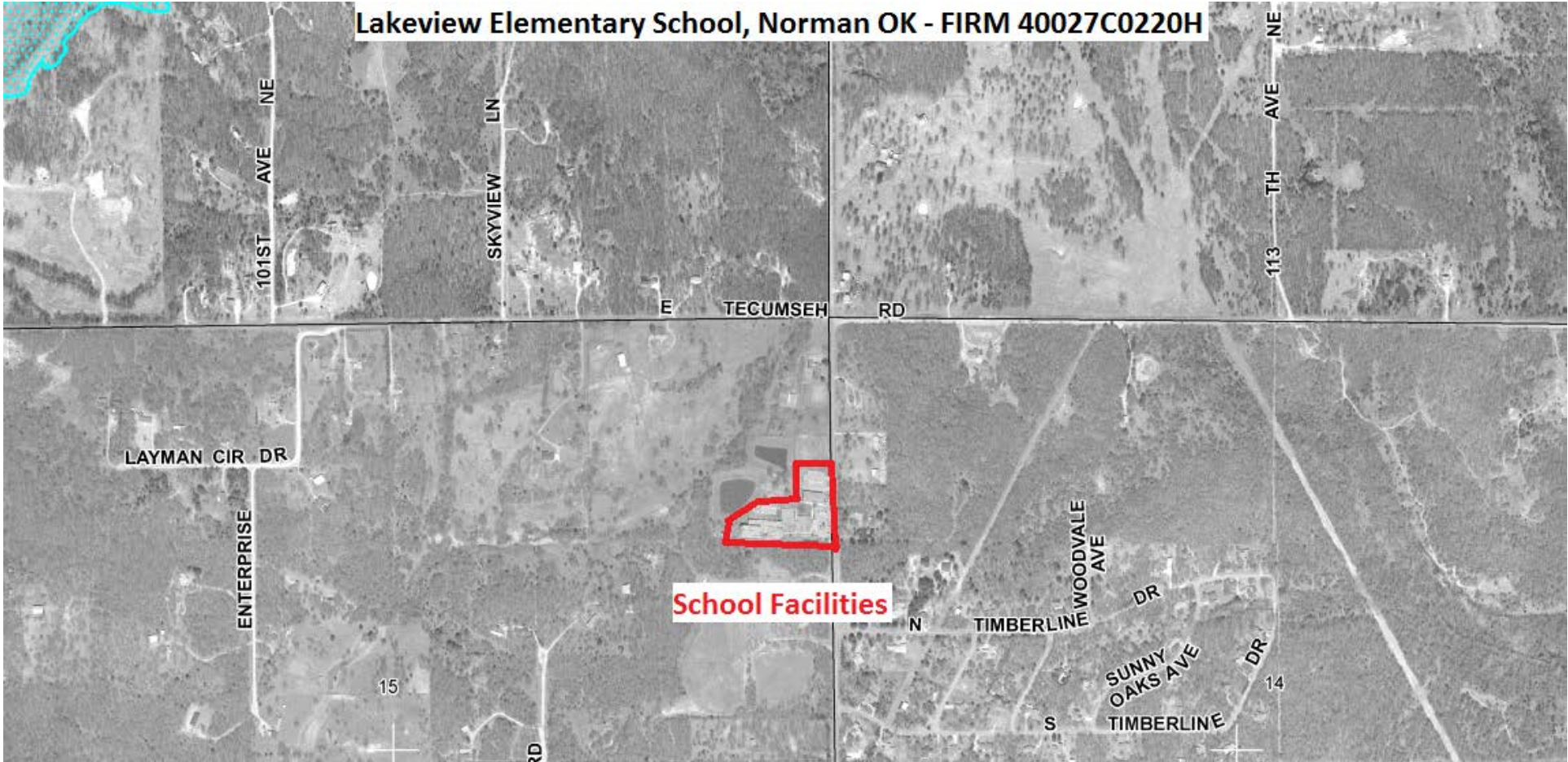
Jefferson Elementary School, Norman OK - FIRM 40027C0285H



Kennedy Elementary School, Norman OK - FIRM 40027C0285H

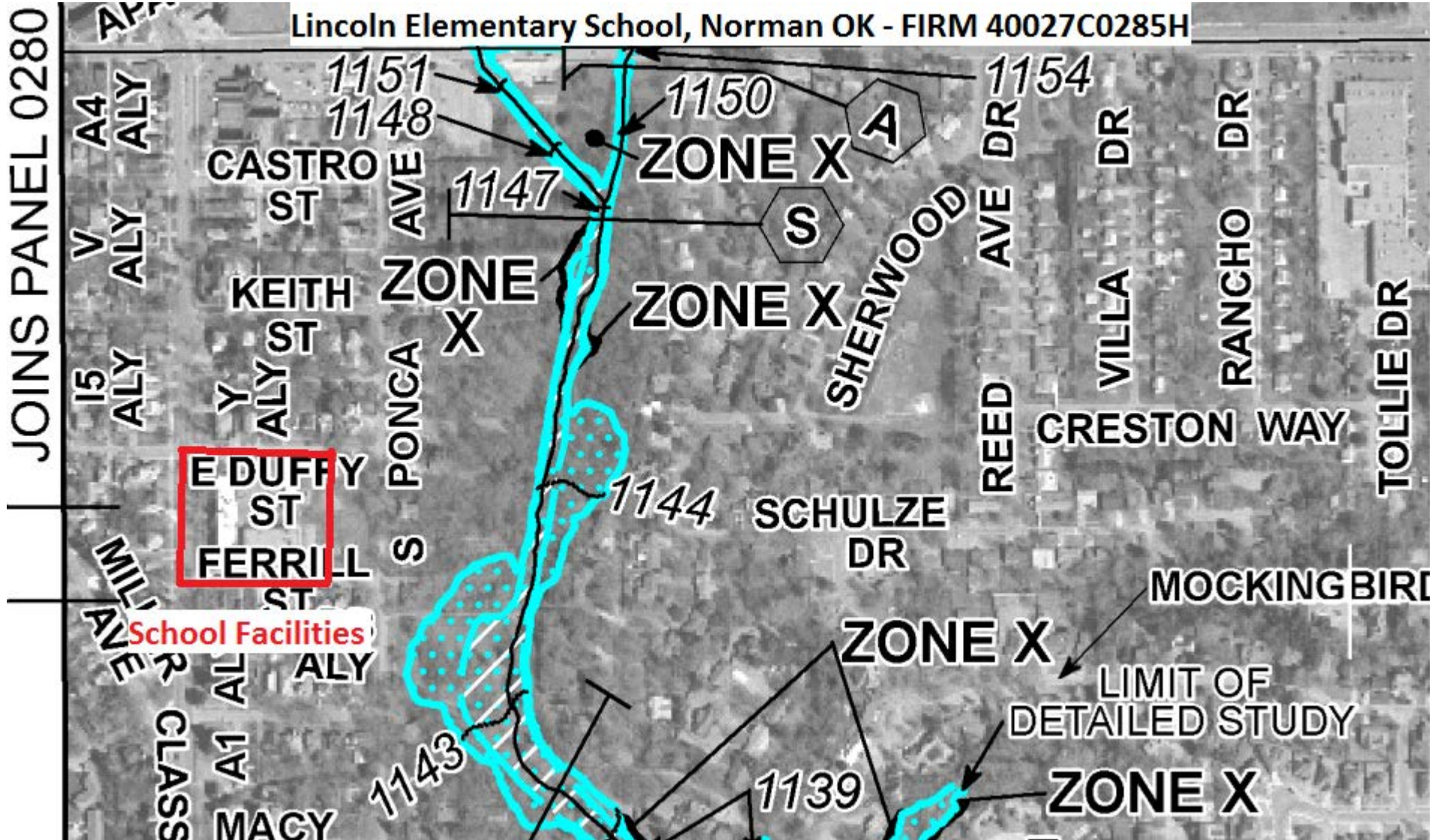


Lakeview Elementary School, Norman OK - FIRM 40027C0220H

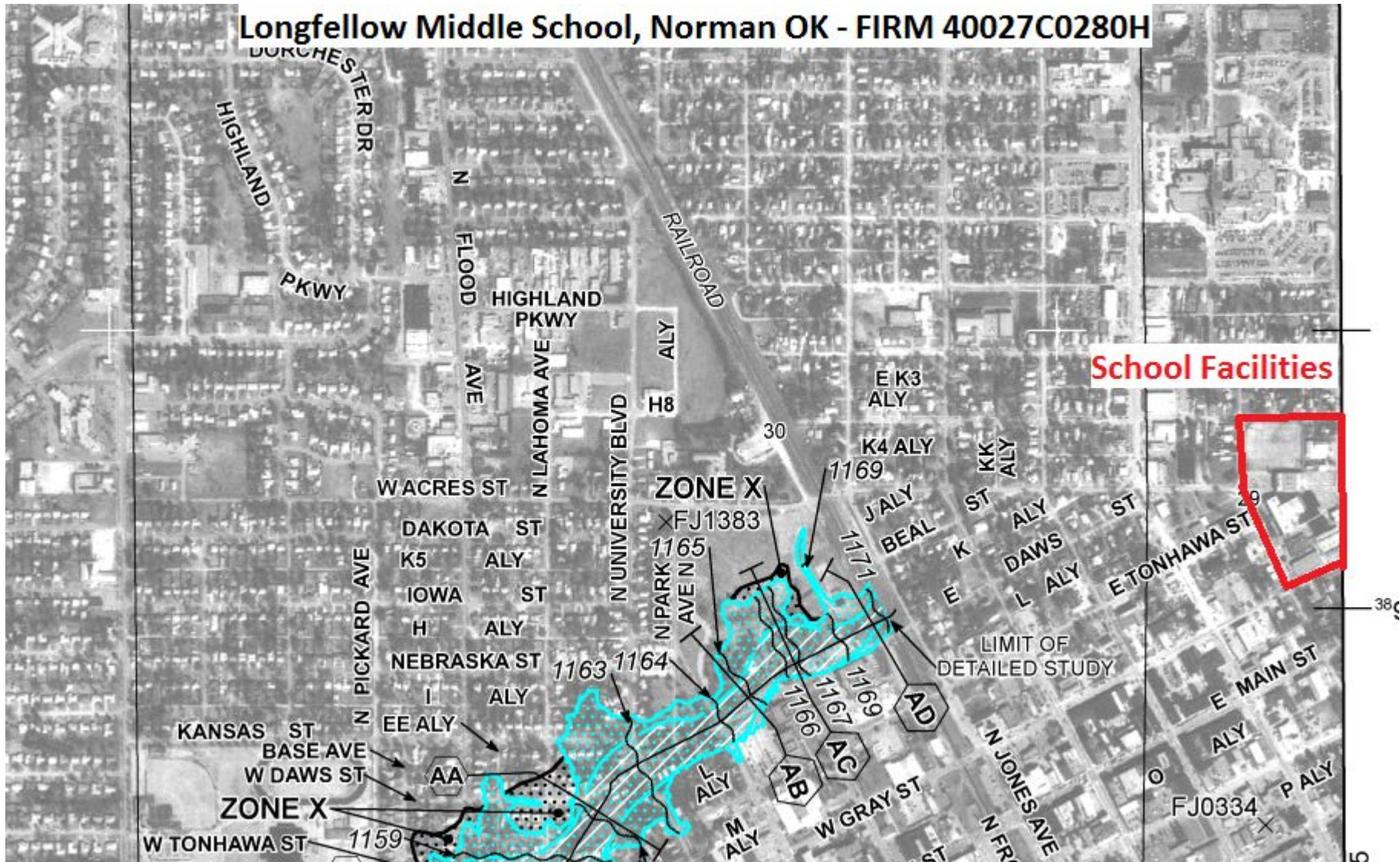


JOINS PANEL 0280

Lincoln Elementary School, Norman OK - FIRM 40027C0285H



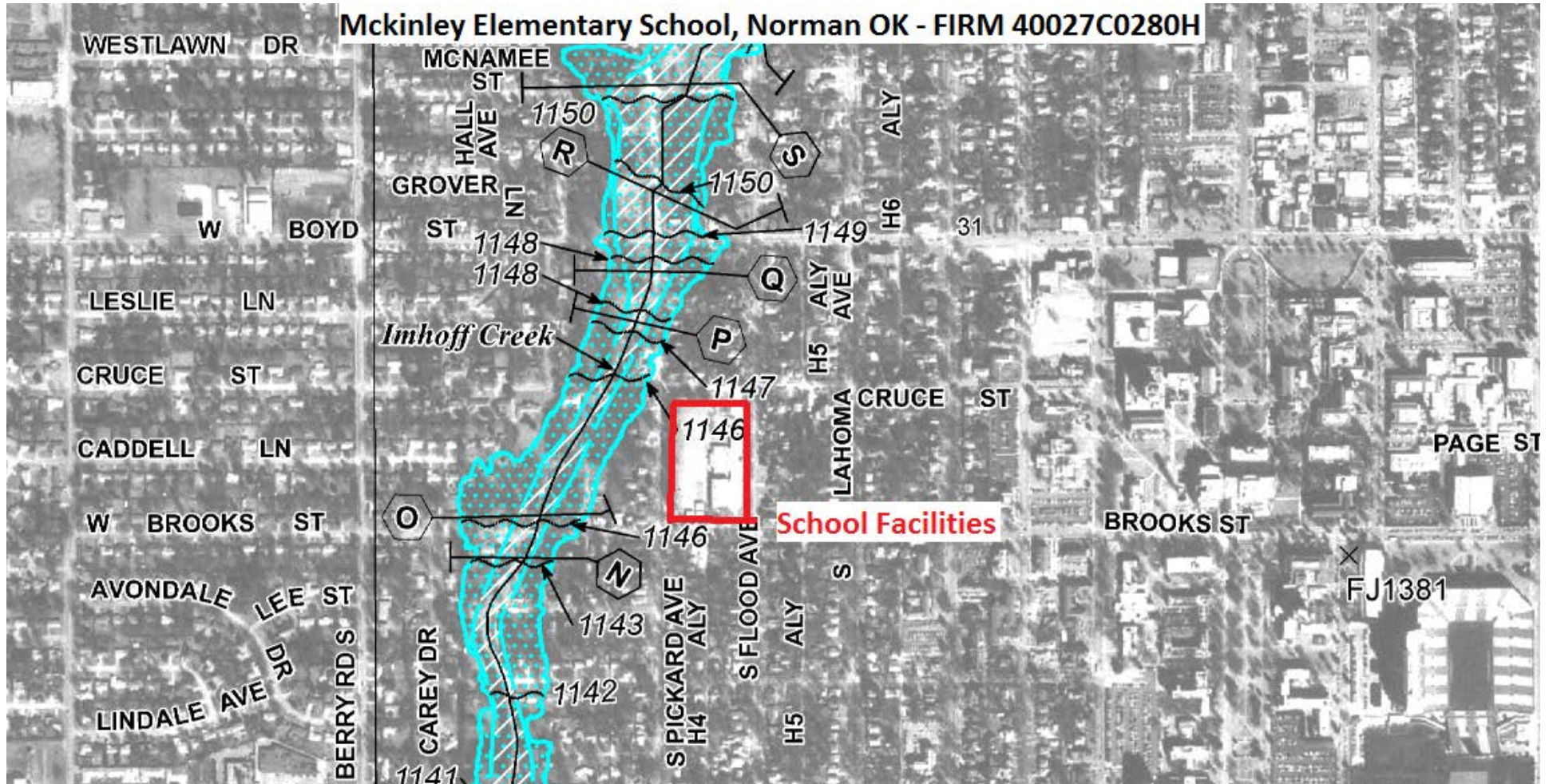
# Longfellow Middle School, Norman OK - FIRM 40027C0280H

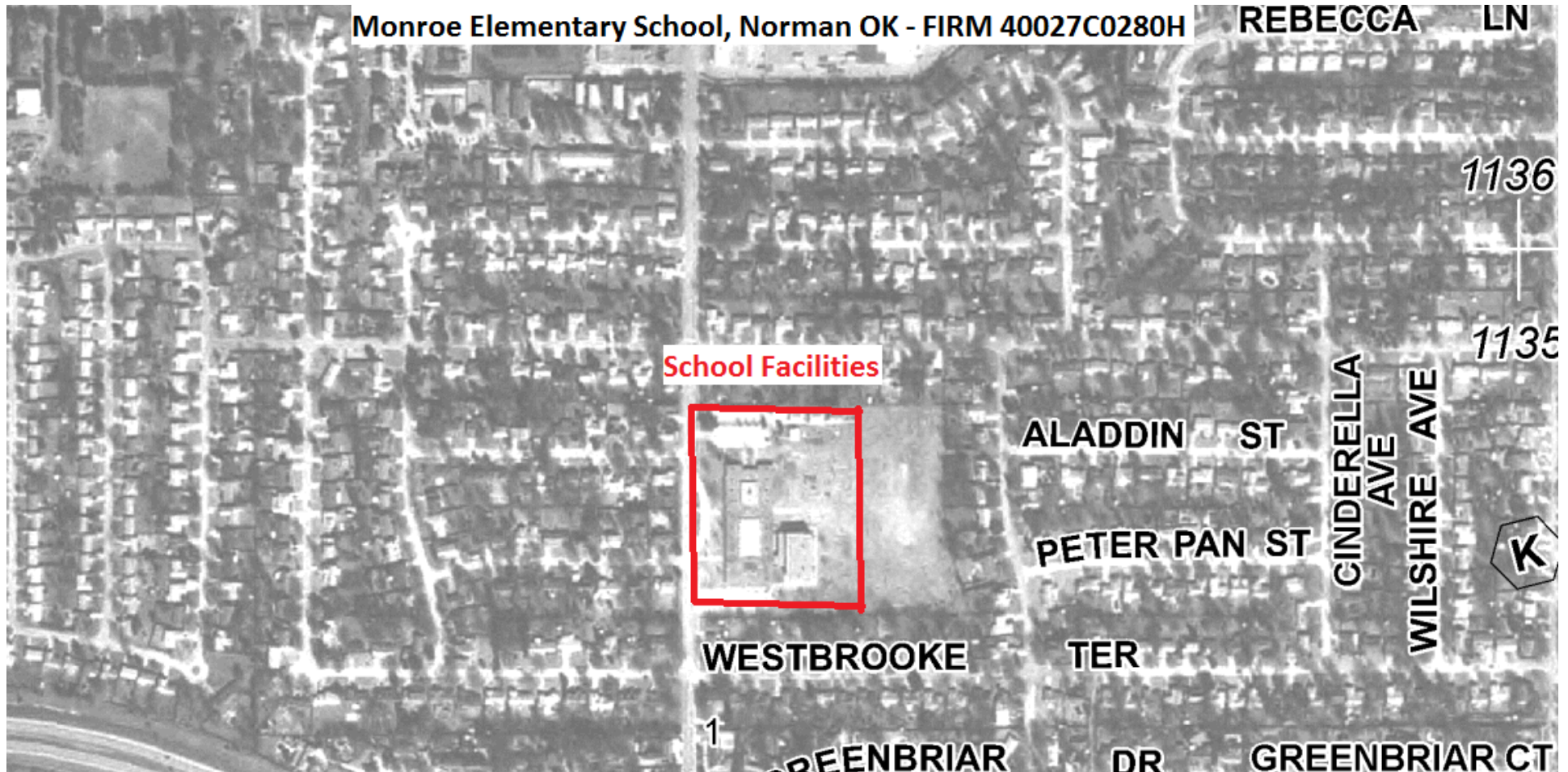




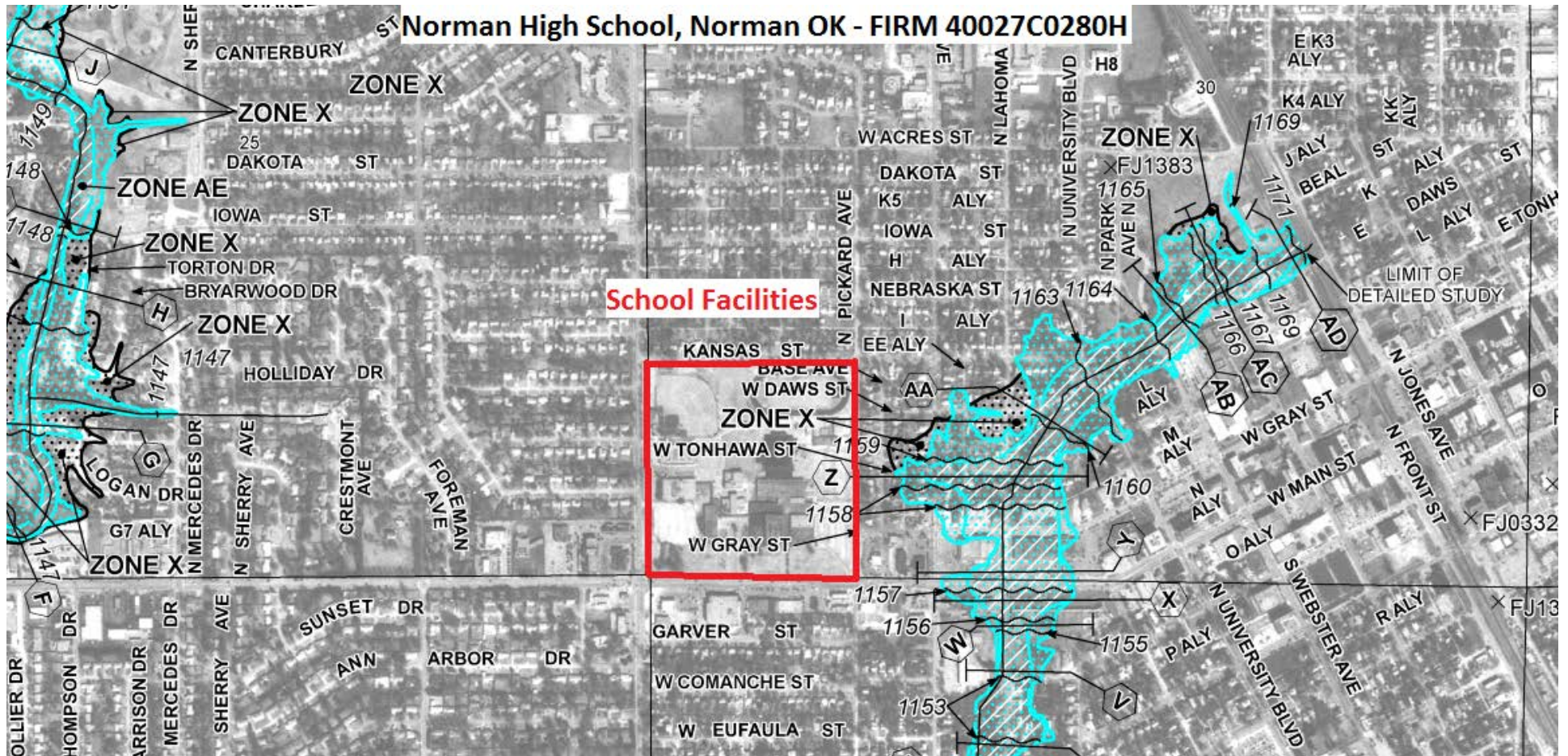


Mckinley Elementary School, Norman OK - FIRM 40027C0280H

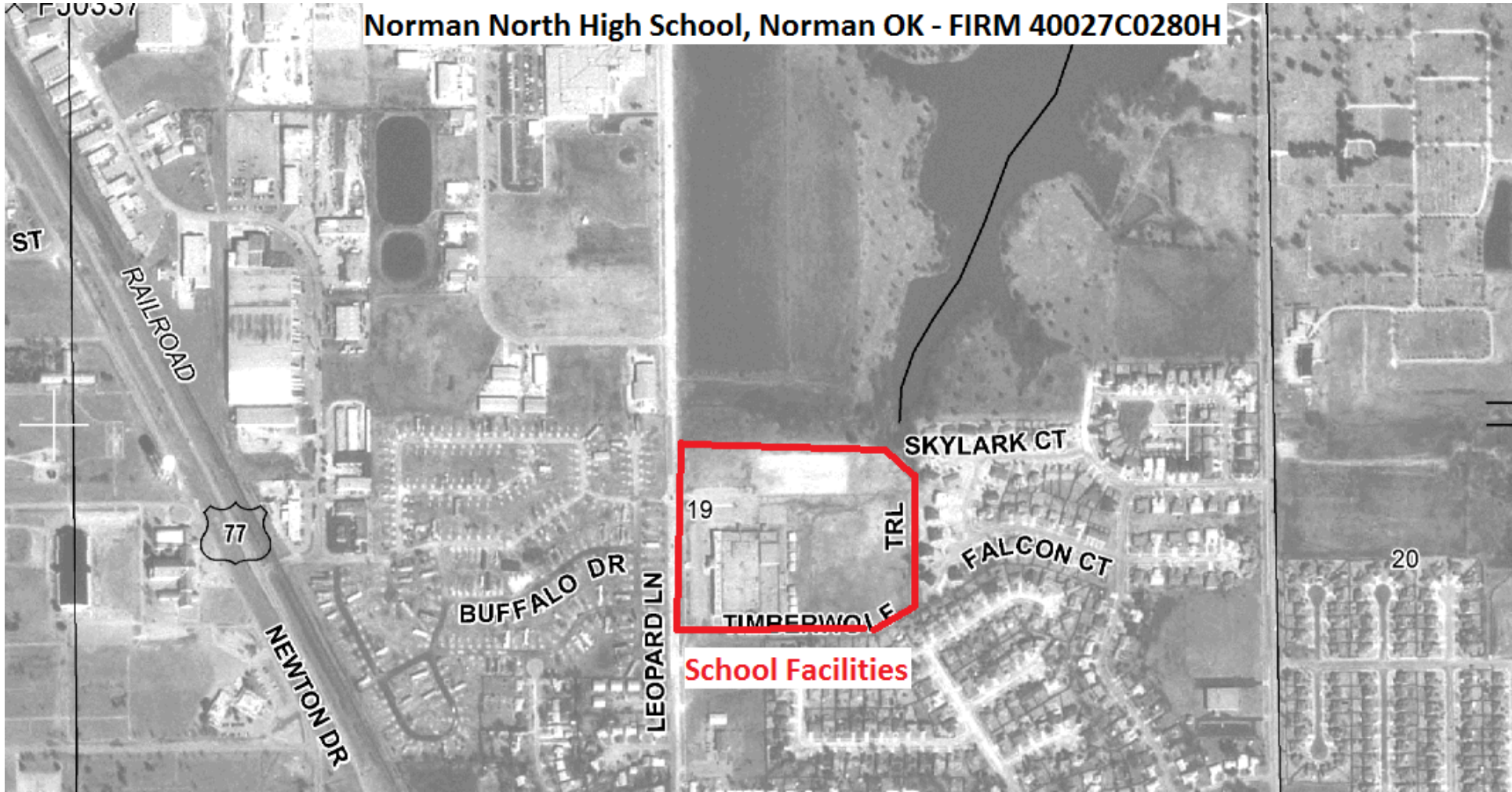




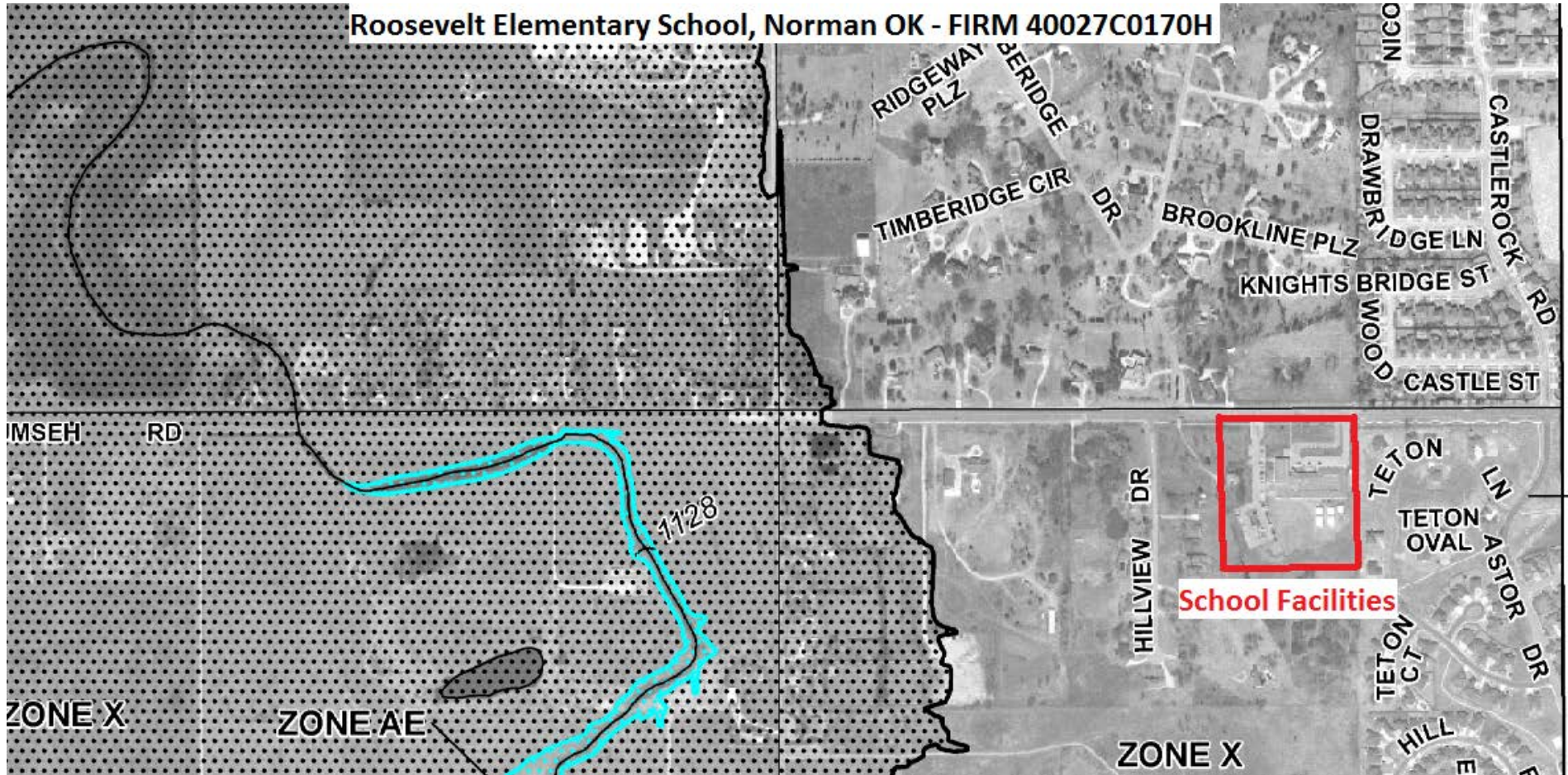
Norman High School, Norman OK - FIRM 40027C0280H

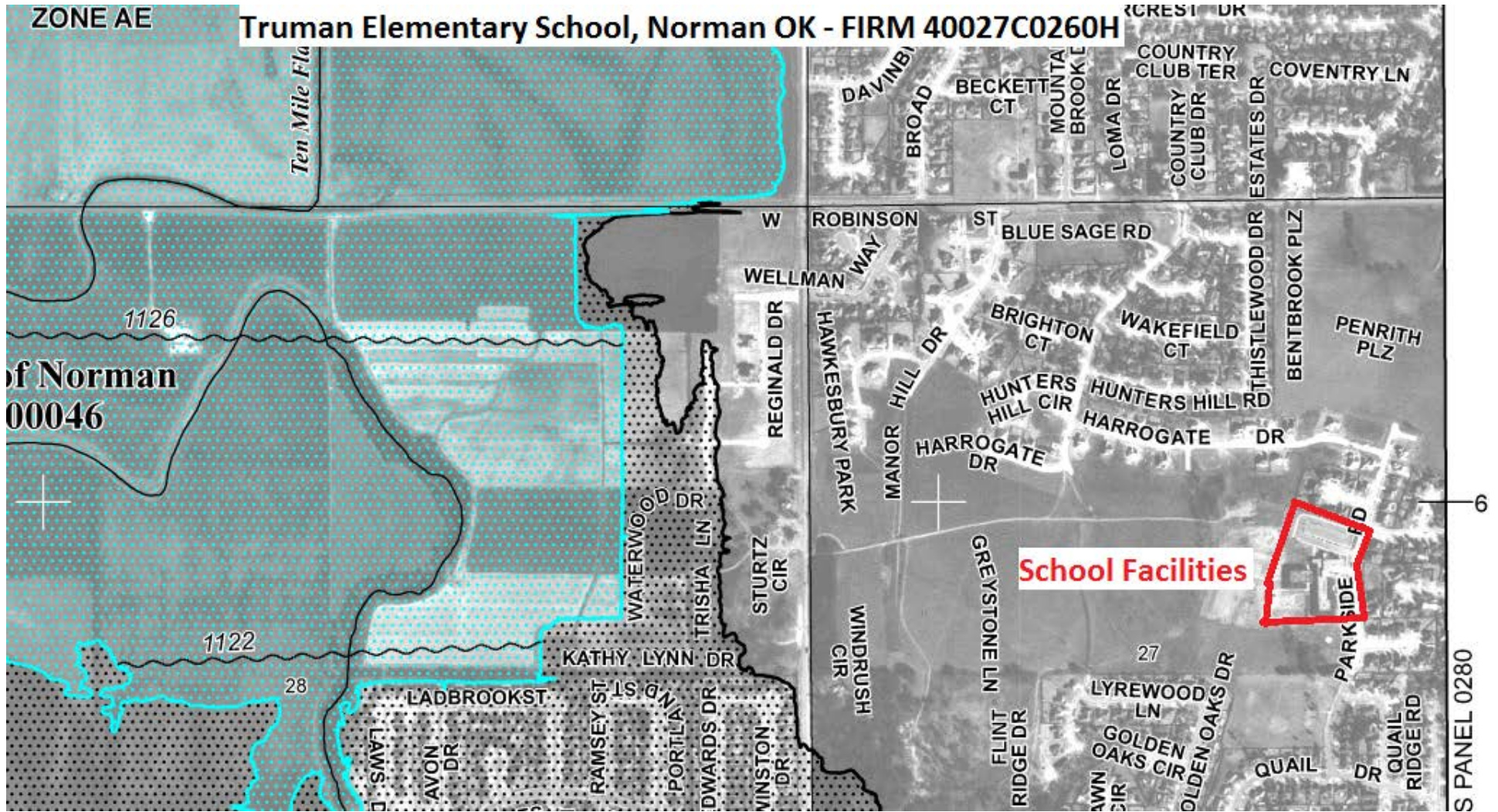


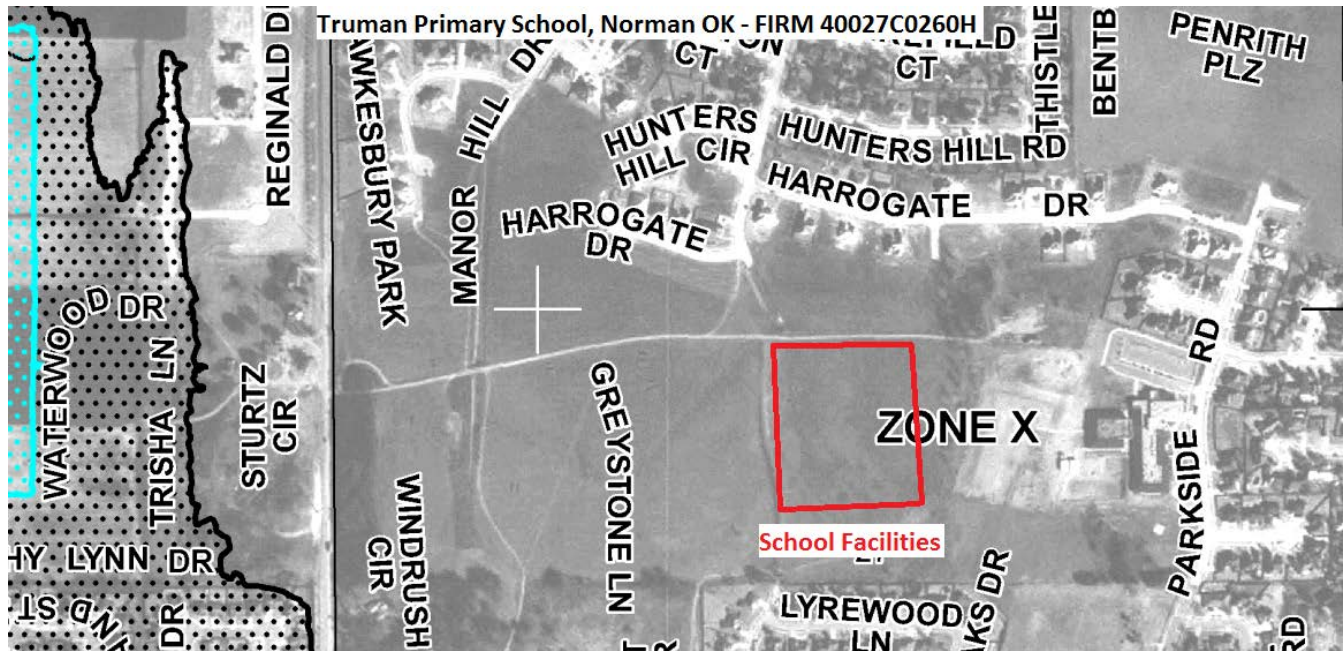
Norman North High School, Norman OK - FIRM 40027C0280H



Roosevelt Elementary School, Norman OK - FIRM 40027C0170H

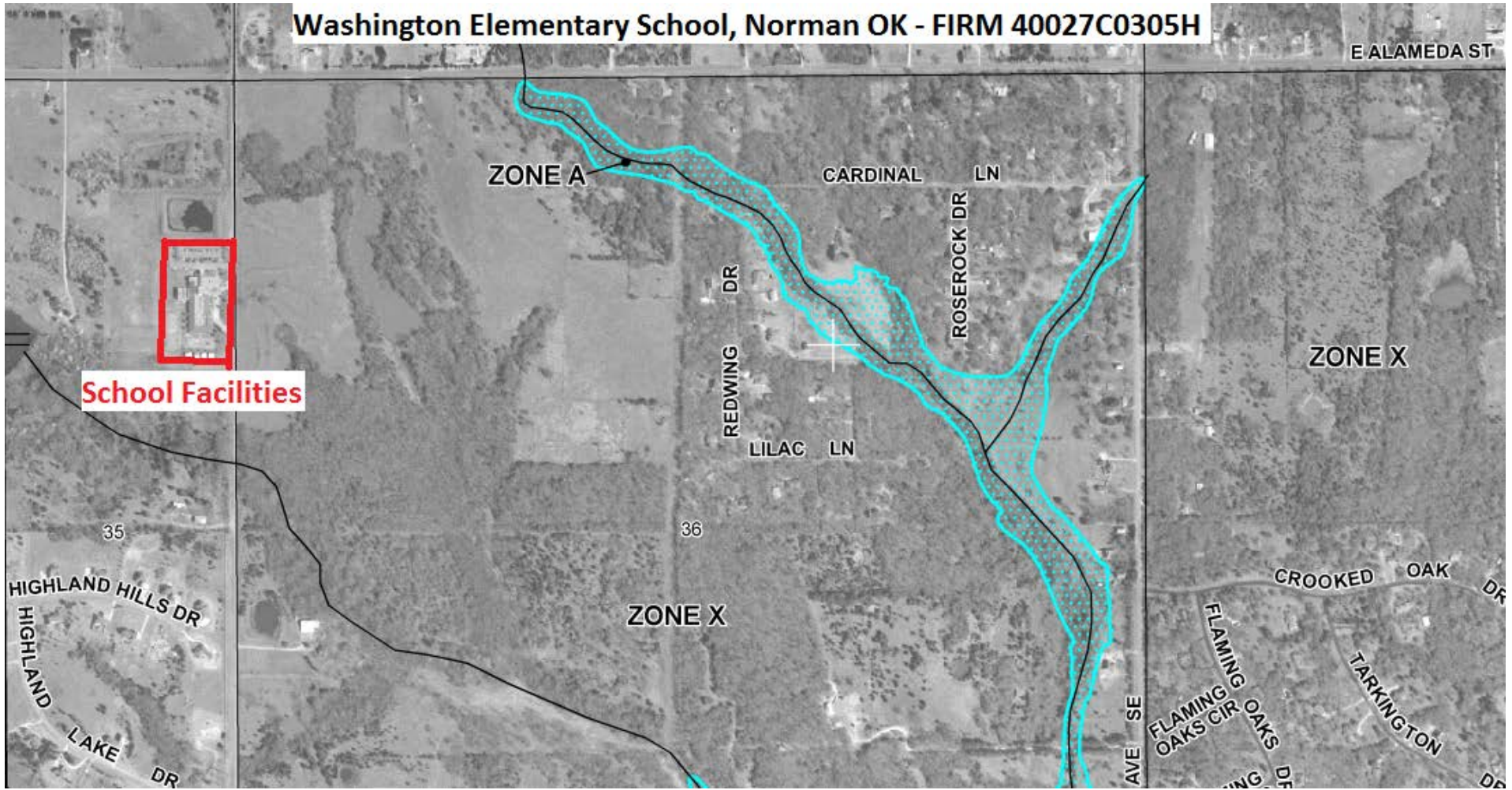




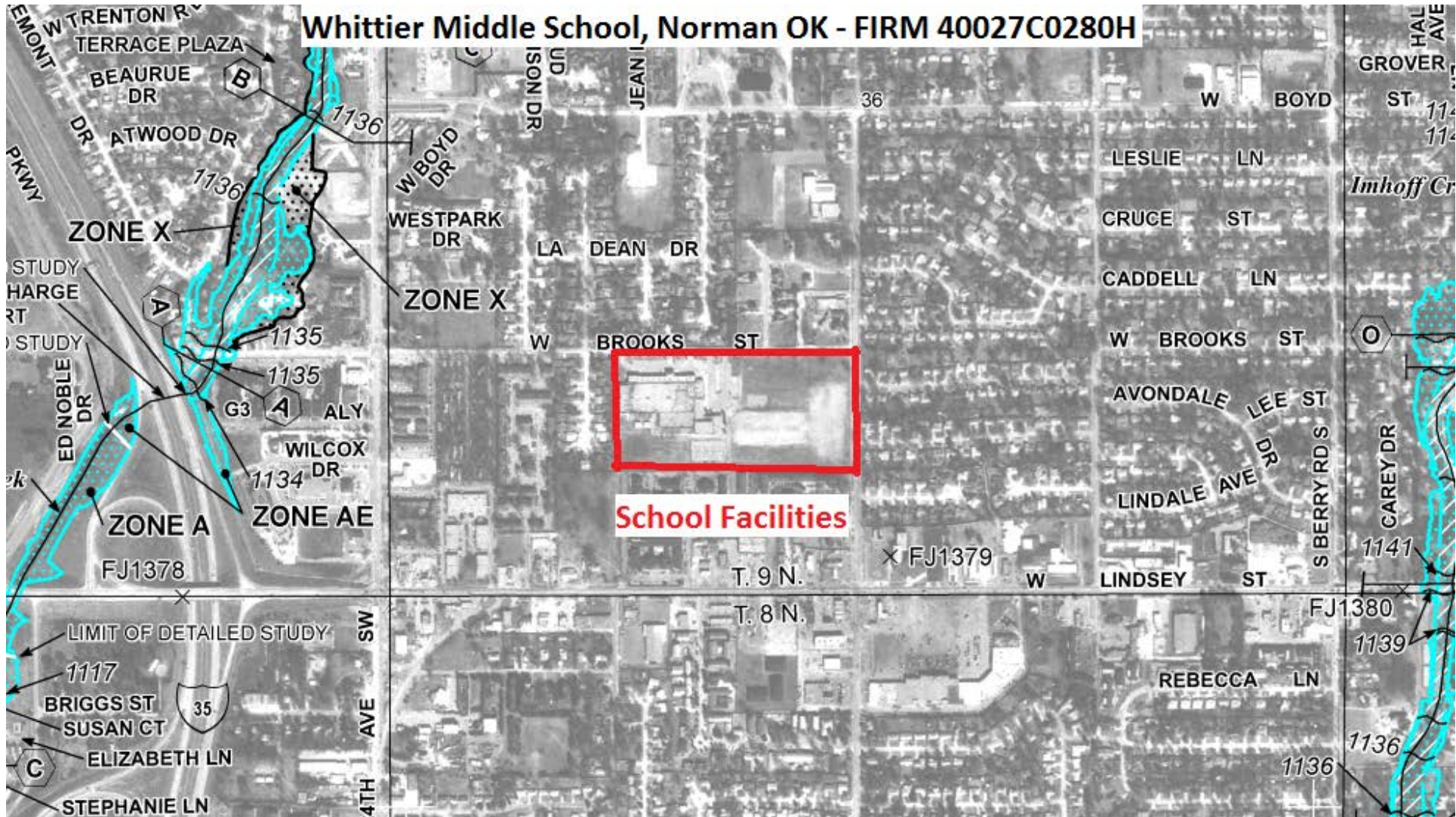




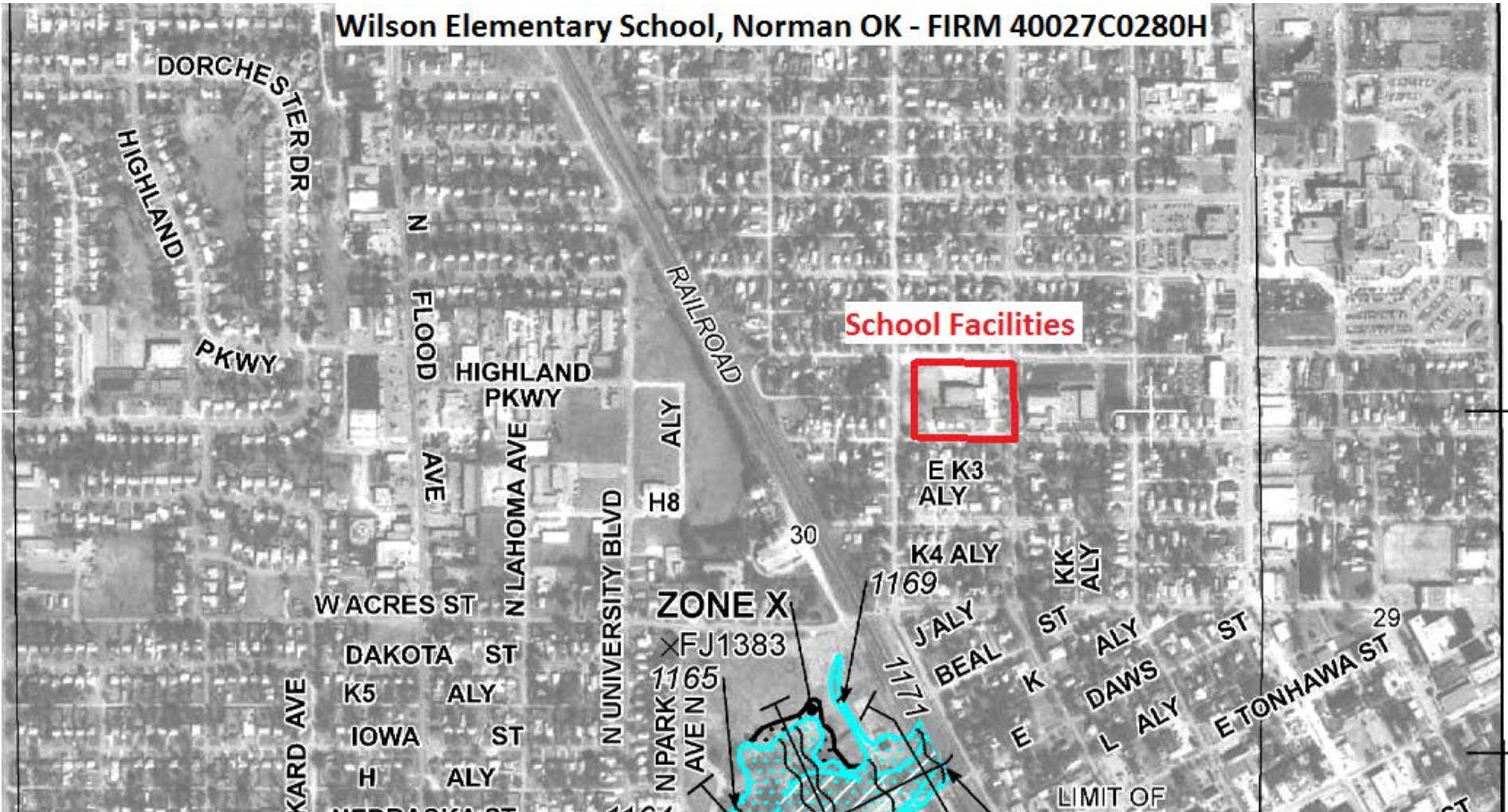
Washington Elementary School, Norman OK - FIRM 40027C0305H



# Whittier Middle School, Norman OK - FIRM 40027C0280H

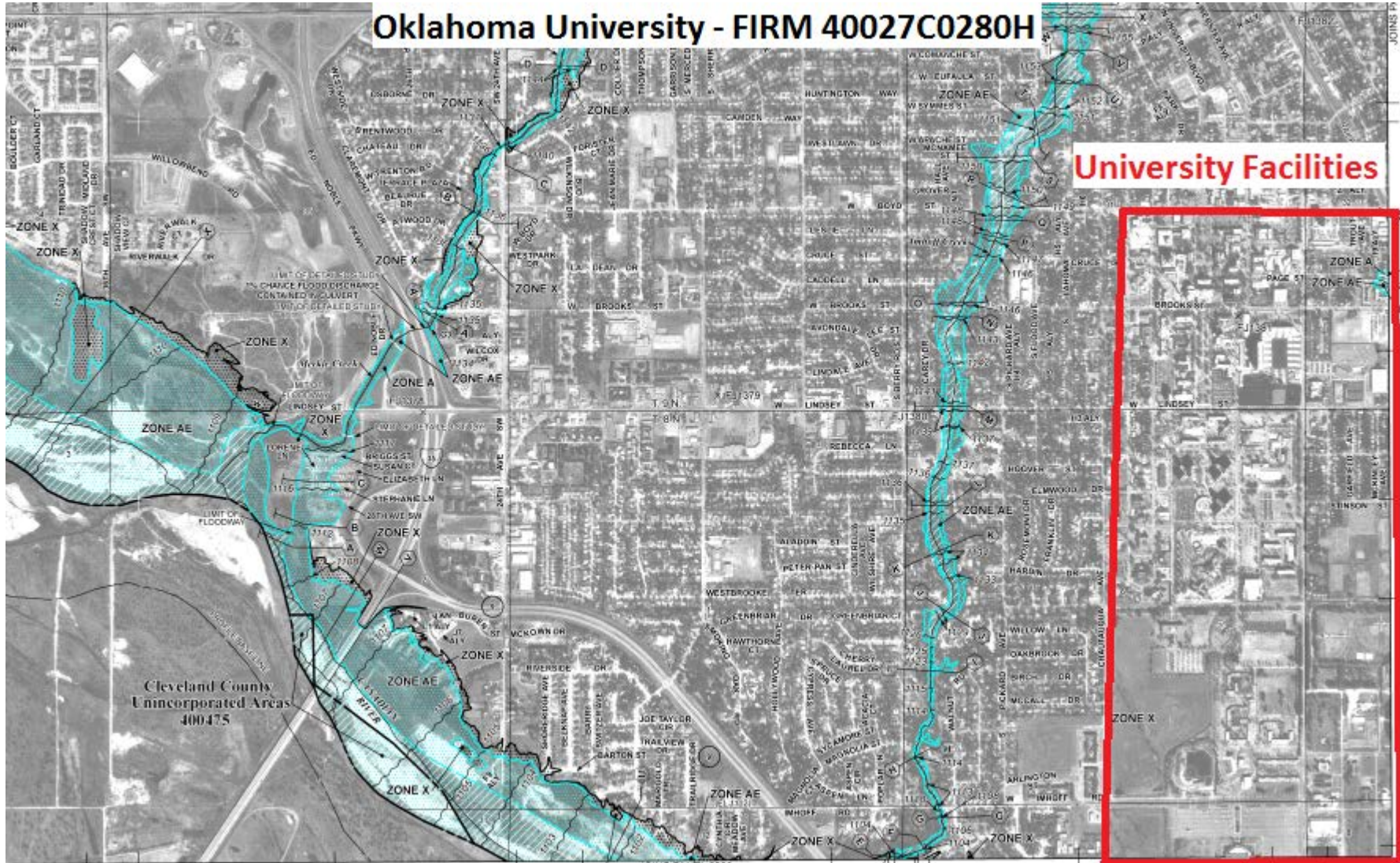


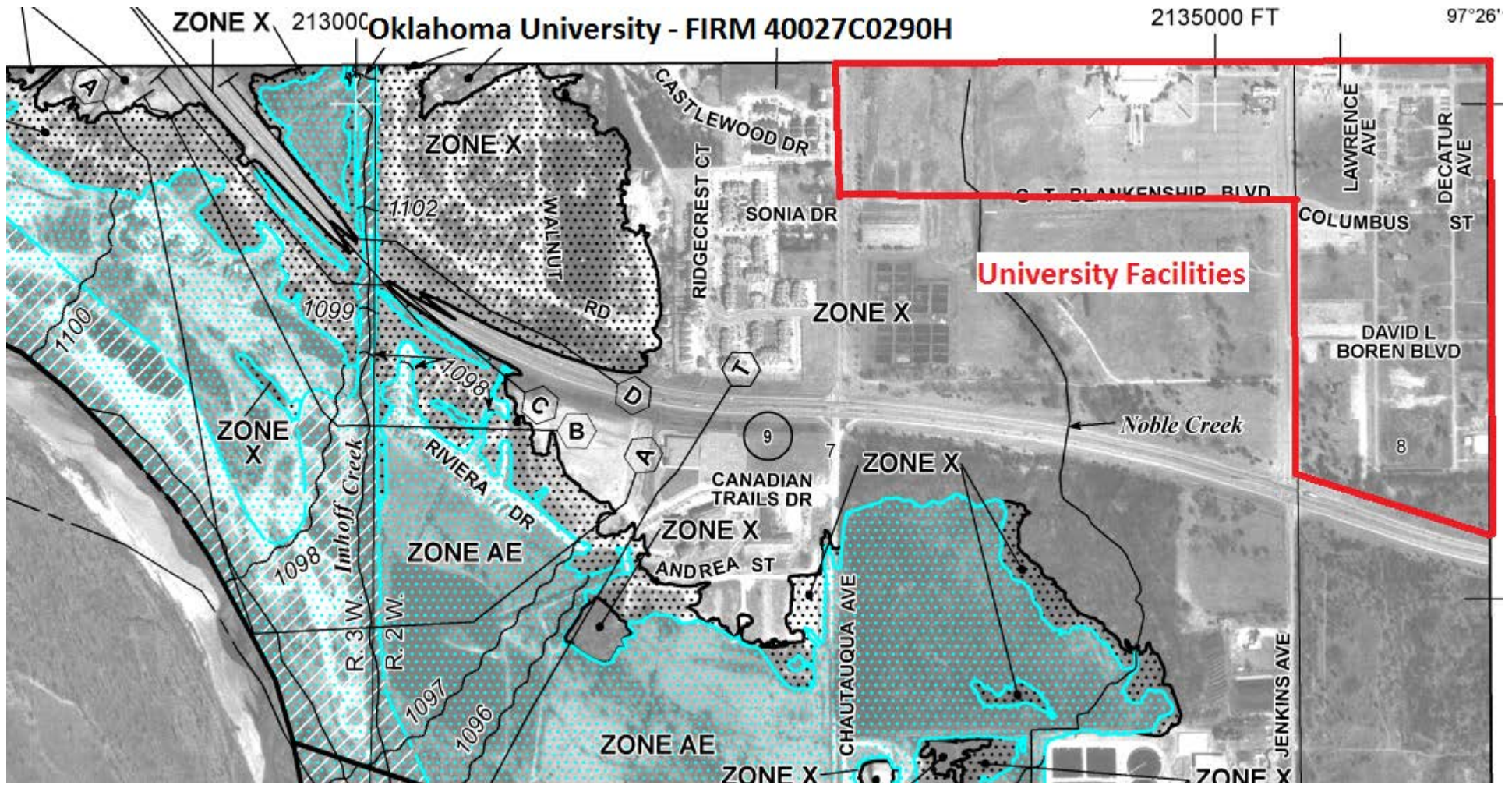
Wilson Elementary School, Norman OK - FIRM 40027C0280H





# Oklahoma University - FIRM 40027C0280H





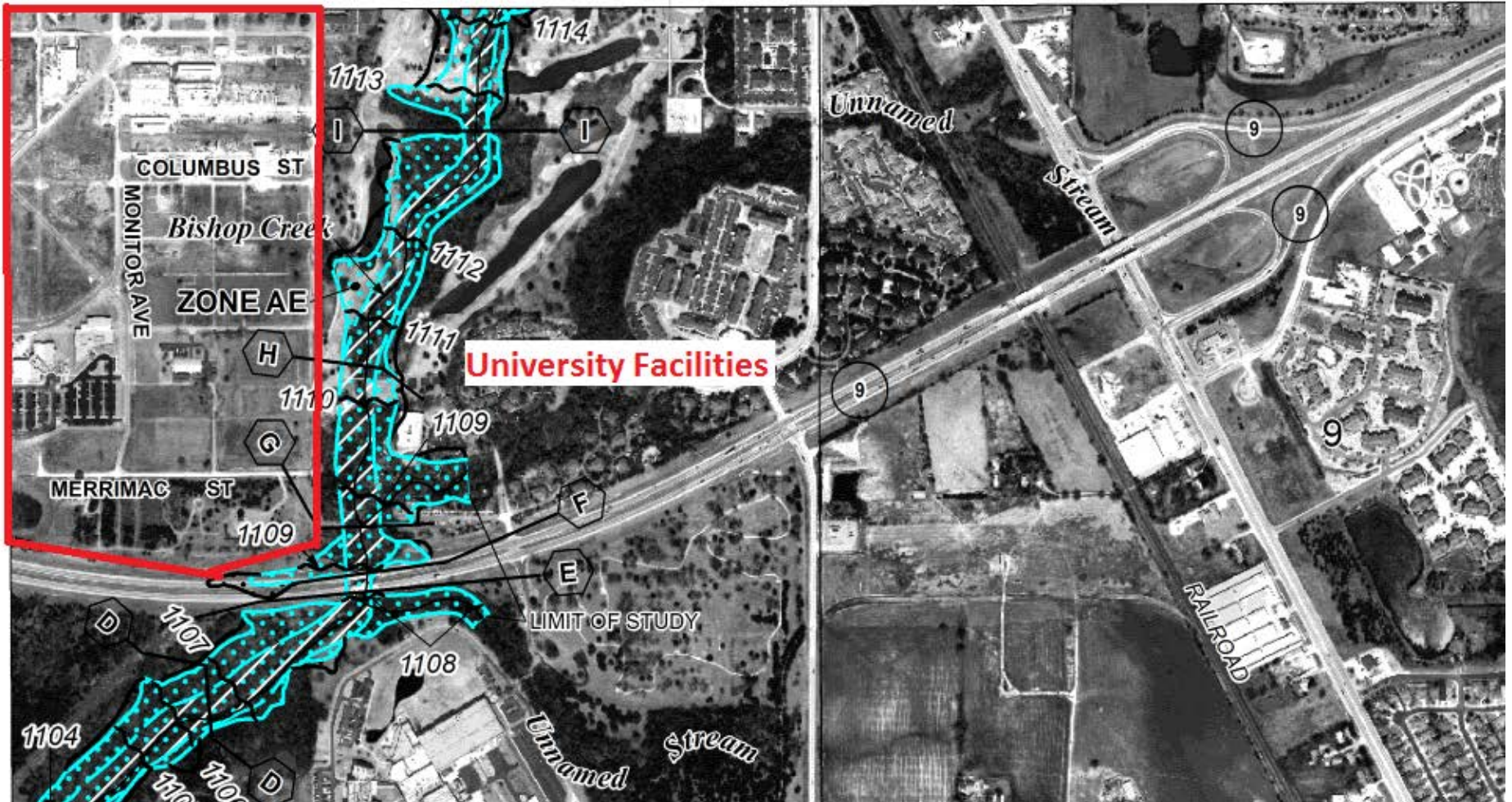
# Oklahoma University - FIRM 40027C0295J

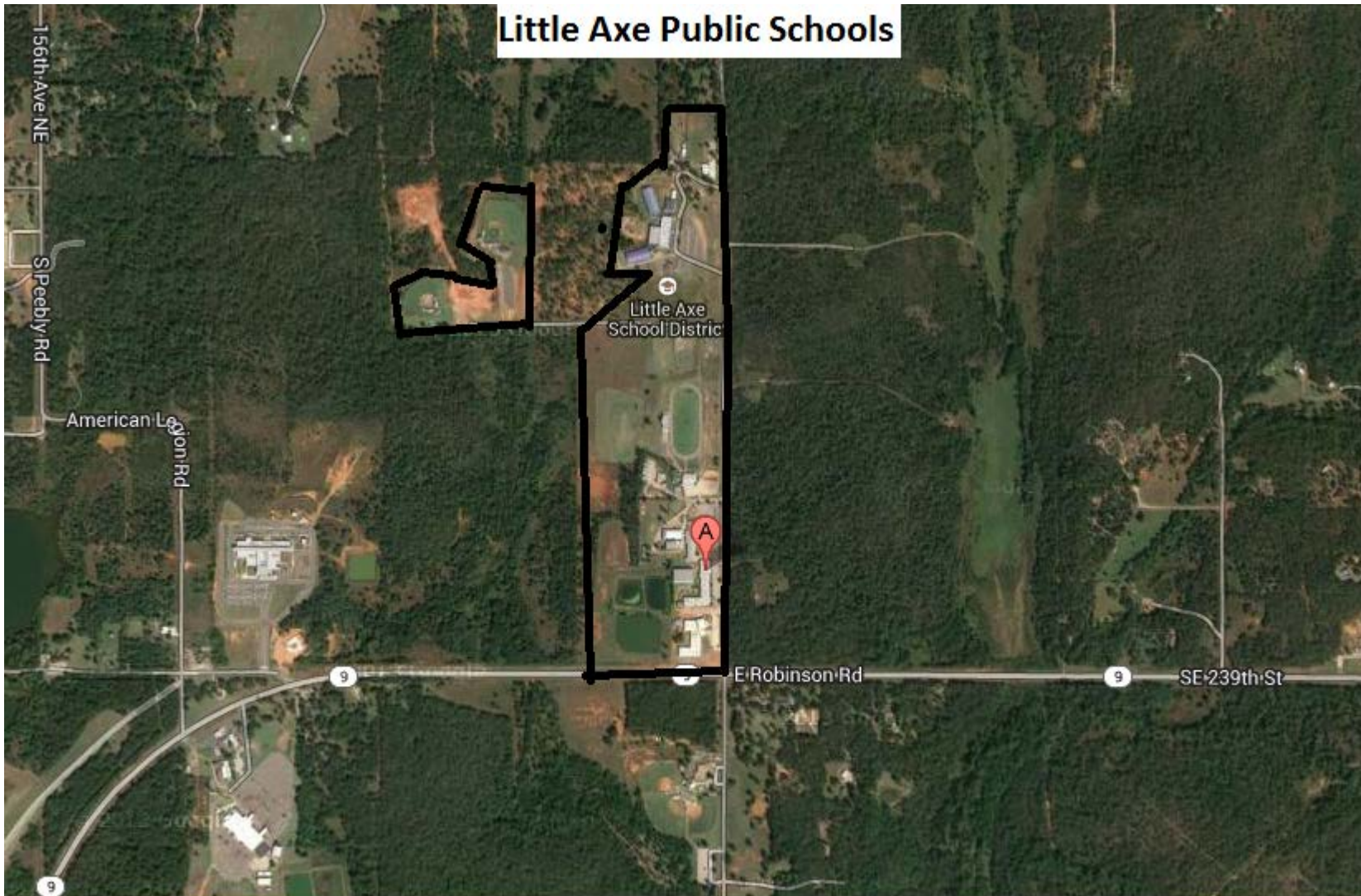
2140000 FT

97°26'15"

11'15"

30 FT





Little Axe Public Schools is located in a rural area and is surrounded by wildland fuels on all sides. The school grounds are well kept and provide a fire break between school facilities and wildland fuels. The probability that school facilities will be affected by a wildland fire is unlikely.



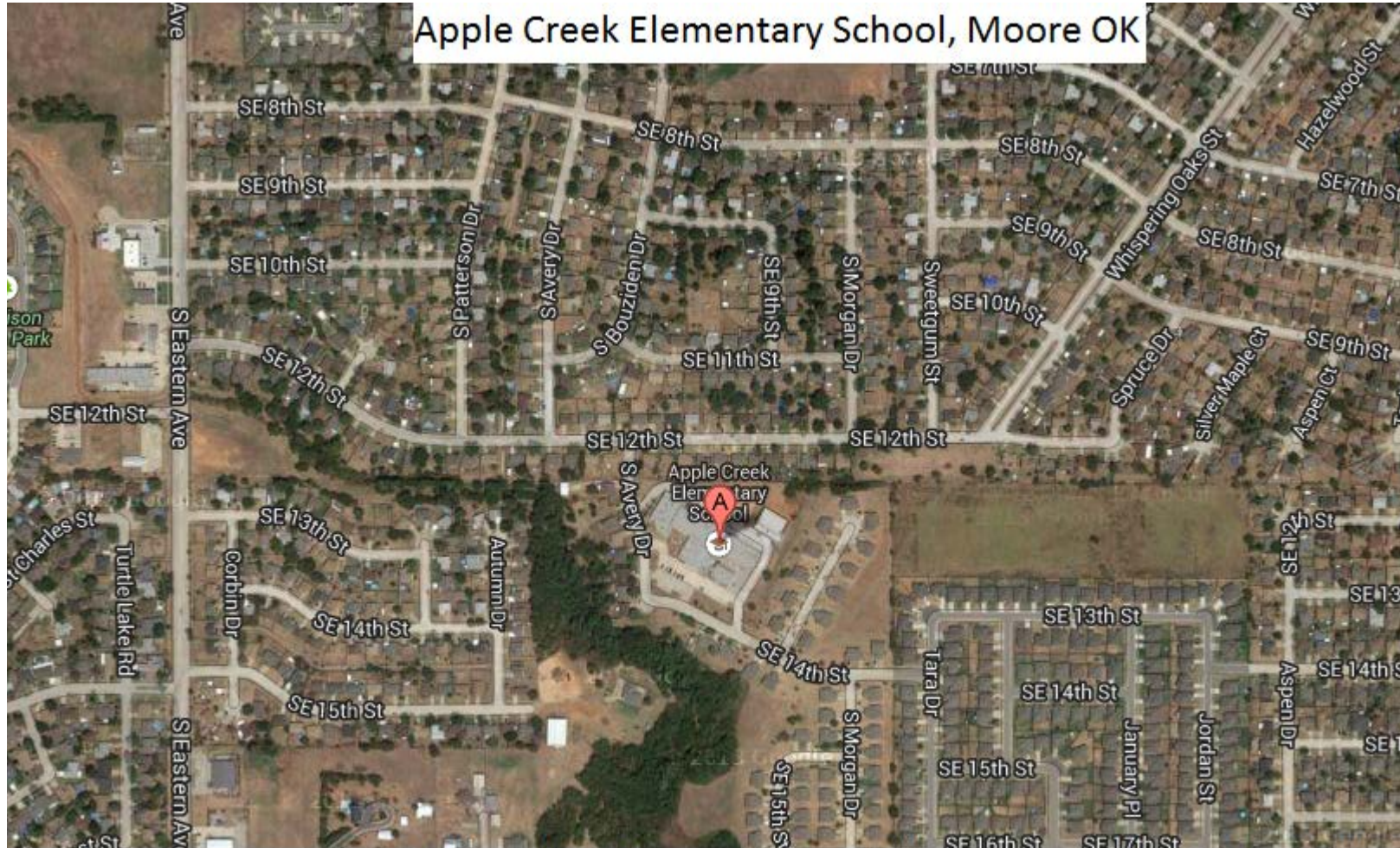
## Robin Hill Public School



Robin Hill Public School District is located in rural Cleveland County. The school is exposed to wildland property on three sides with a church and residential housing on the south side. The school grounds are well maintained with defensible space between the school facilities and the wildland exposure. The probability of Robin Hill PS being affected by a wildfire event is considered unlikely

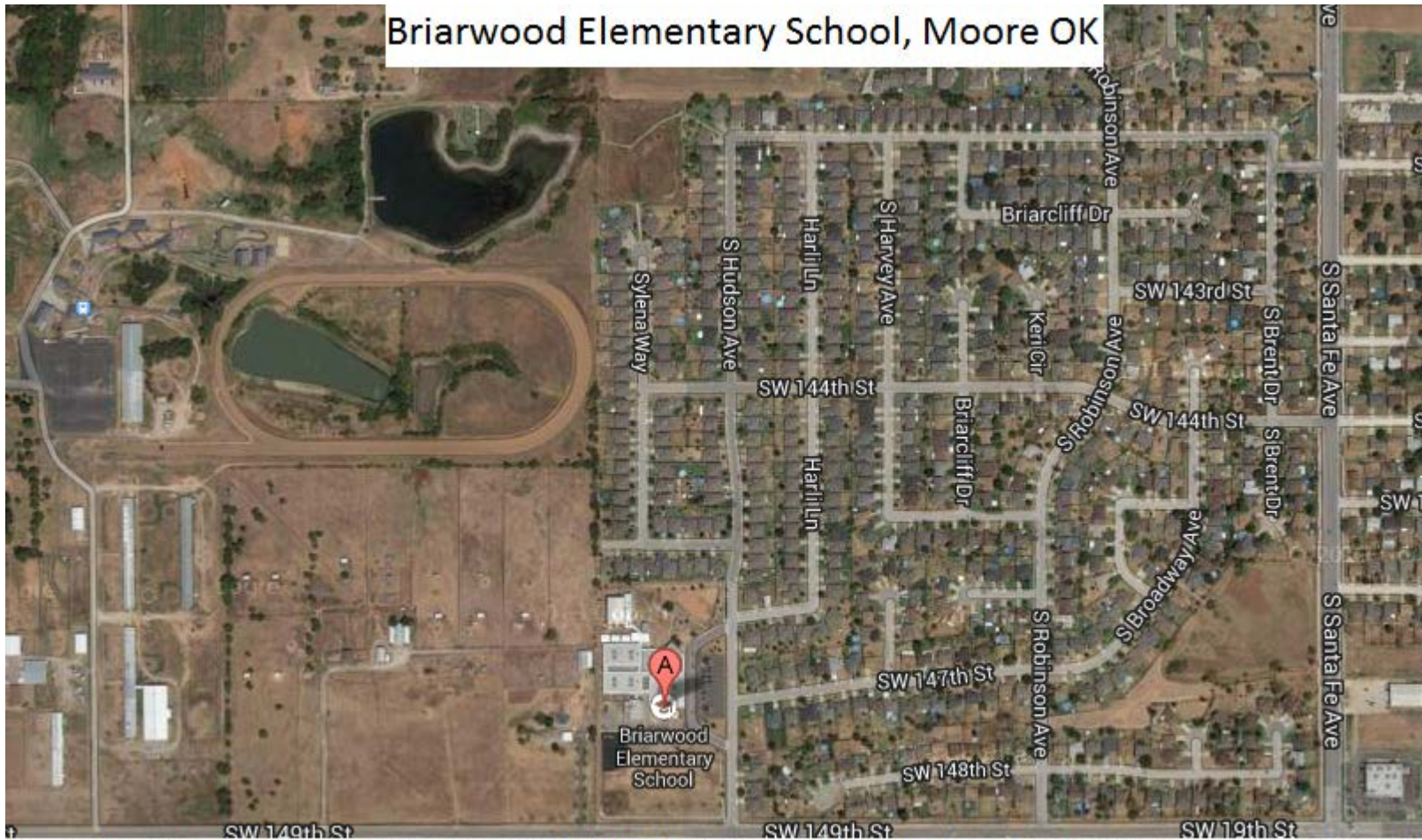


## Apple Creek Elementary School, Moore OK



Apple Creek elementary is located within the city limits of Moore and is surrounded by residences. On the south and west side is a wooded area with residences and a road separating the school from it . The school facilities have little to no exposure to wildland areas and the likelihood of a wildland fire (wildfire) affecting school facilities is none

## Briarwood Elementary School, Moore OK



Briarwood elementary is part of the moore school district although it is located just inside the Oklahoma City city limits. The school is surrounded on three sides by residences and a farm house and barn on the west side. The school facilities have little to no exposure to wildland areas and the likelihood of a wildfire affecting school facilities is none.

## Brink Junior High School, Moore OK



Brink Junior High School is located within the city limits of Moore and is surrounded by residences on the north and west sides. a church adjoins the school on the south and there is a tree line to the east of the school. The school grounds are maintained and sufficient space separates the school buildings from the tree line. The probability of a wildfire affecting school facilities is considered none.

## Broadmoore Elementary School, Moore OK



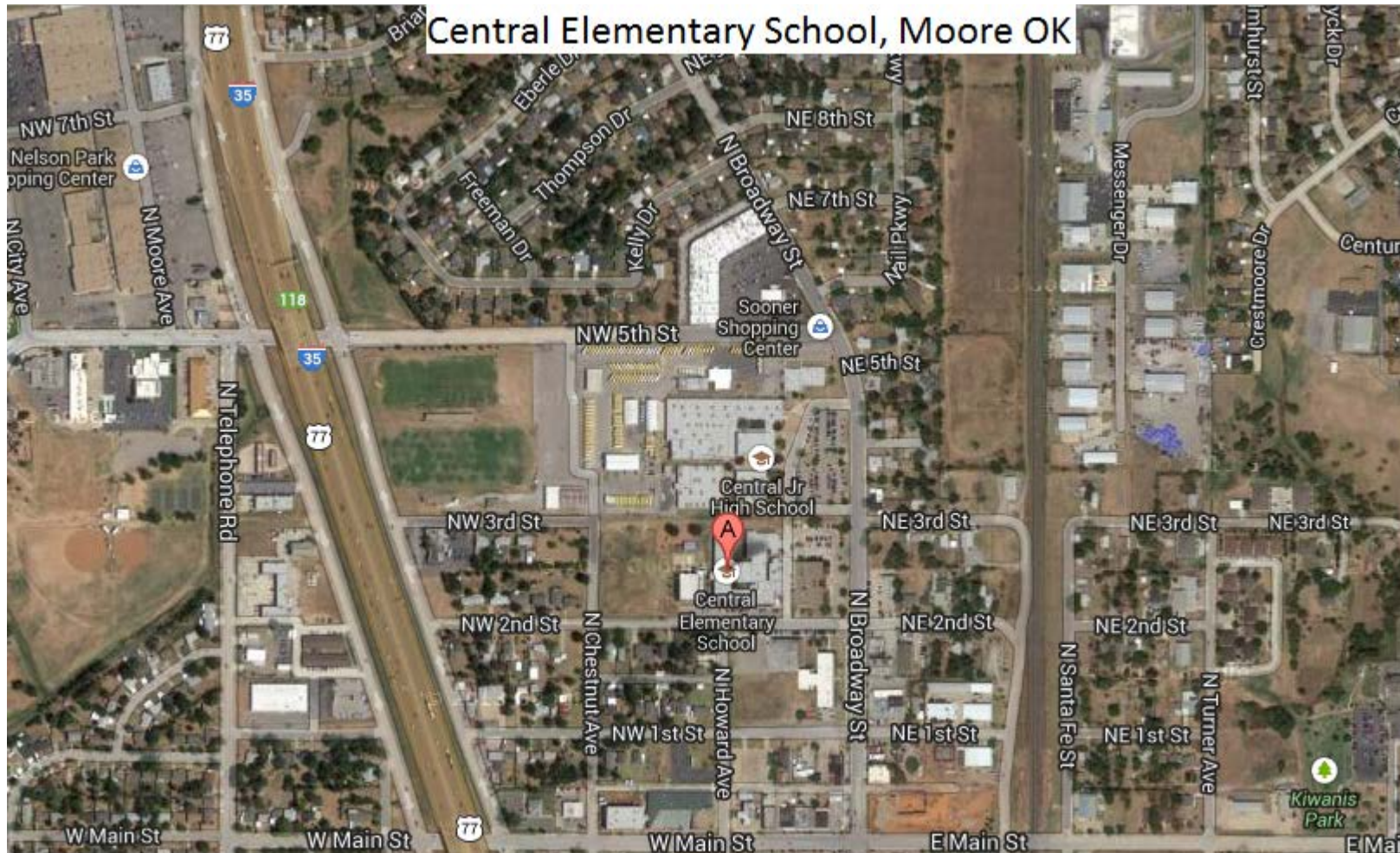
Broadway Elementary School is located within the city limits of Moore. Several housing additions, farms, and a golf course surround the school. The school grounds are well maintained and the likelihood of a wildfire affecting school facilities is none.

## Bryant Elementary School, Moore OK



Bryant Elementary School is part of the Moore school district although it is located within the city limits of Oklahoma City. The school is surrounded by housing additions on the west and south sides. A large mobile home park borders the school on the north and a vacant field with a small tree line on the east. The school grounds are well kept and provide a large fire break between school facilities and the vacant field. The probability of a wildfire affecting school facilities is considered none.

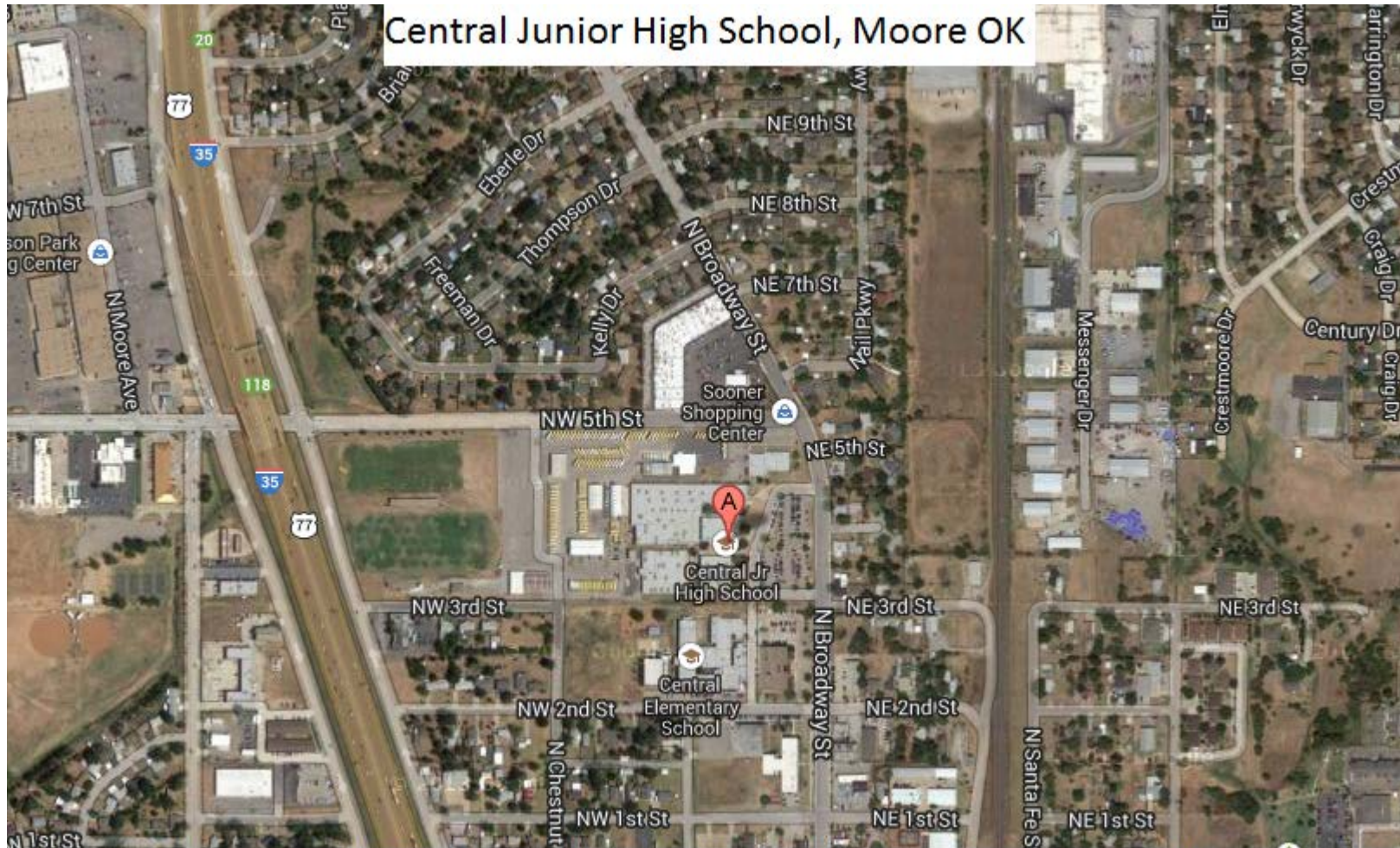
## Central Elementary School, Moore OK



Central Elementary School is located within the city limits of Moore and is surrounded by residences on the west, south, and east sides. Central Junior High School borders the north side. The school has no exposure to wildland areas. The probability of a wildfire affecting school facilities is considered none.



## Central Junior High School, Moore OK



Central Junior High School is bordered on the west side by Interstate 35, on the north and east by housing additions and on the south by Central Elementary School. The school has little to no wildland exposure. The probability of a wildfire affecting school facilities is considered none.

## Earlywine Elementary School, Moore OK

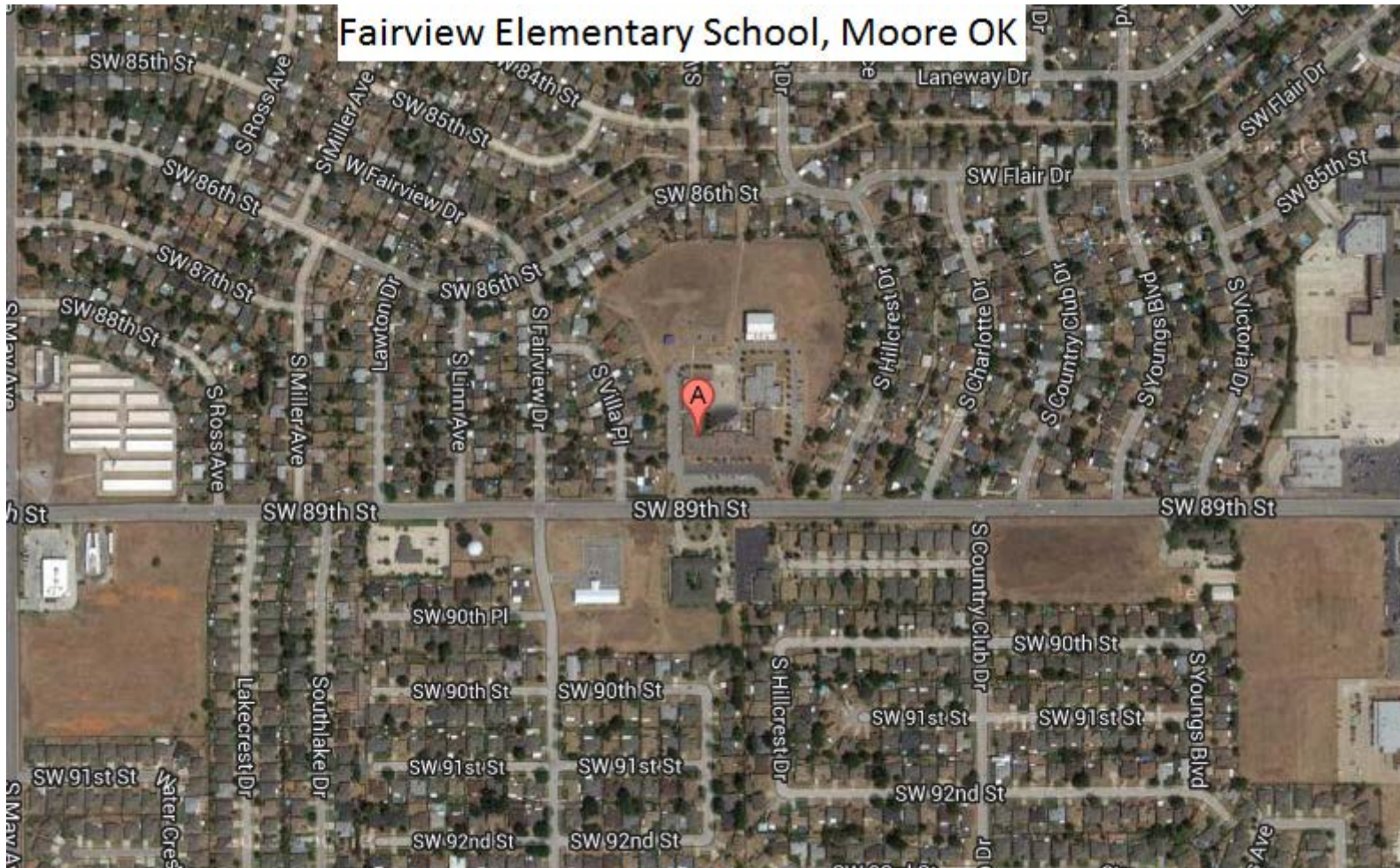


Earlywine Elementary School is surrounded by residential housing on three sides and a man made pond on the east side. The school has no exposure to wildland property and the probability of school facilities being affected by a wildfire event is considered none.



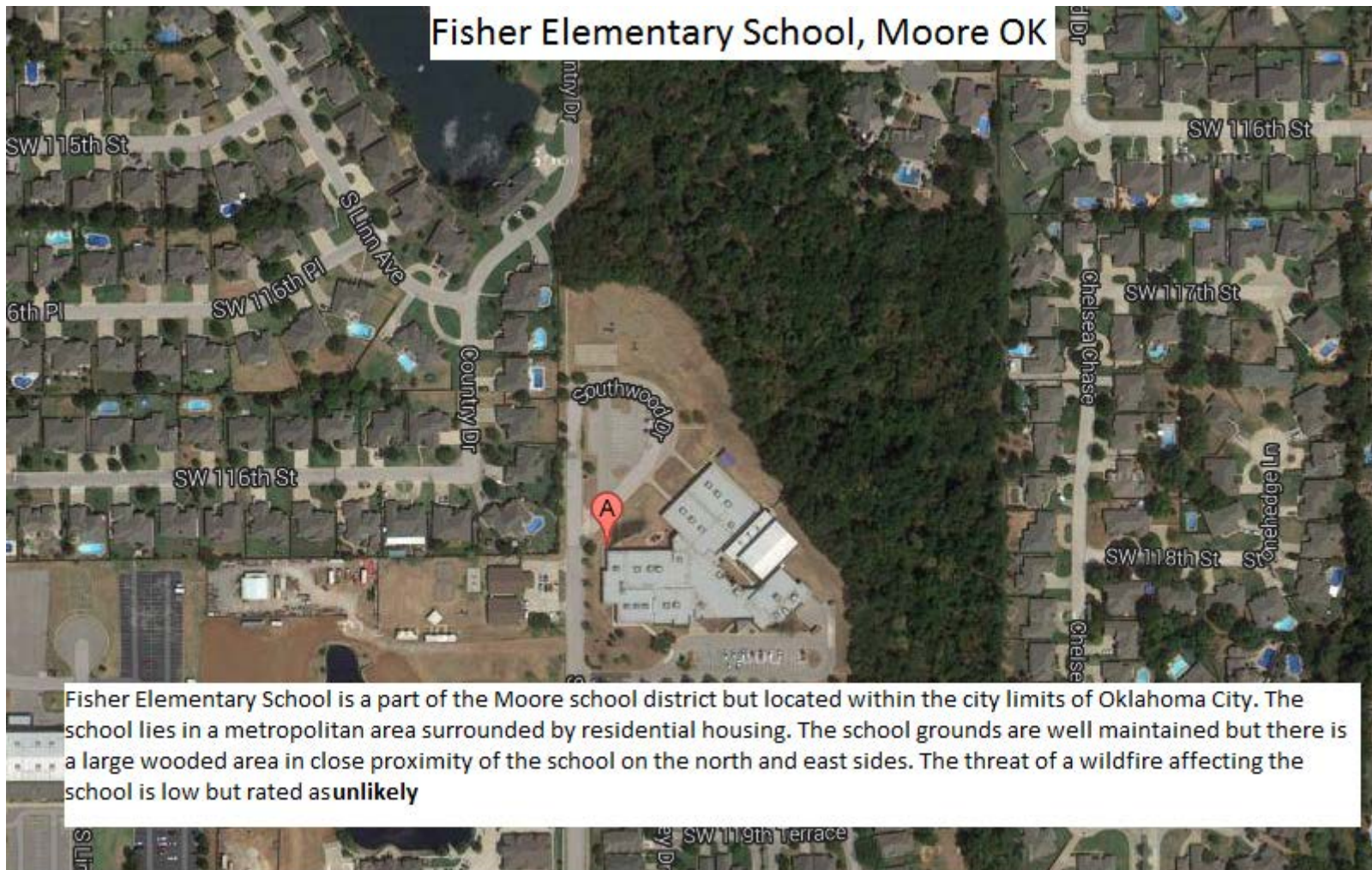
Eastlake Elementary School is part of the Moore school district although it is located within the city limits of Oklahoma City. The school is encompassed by residential housing and has no exposure to wildland property. The risk of Eastlake being involved in a wildfire event is **none**

## Fairview Elementary School, Moore OK



Fairview Elementary School is part of the Moore school district although the school is located within the Oklahoma City city limits. The school is surrounded by residential housing and a church on the south side. Fairview Elementary School has no exposure to wildland property and the chance of the school facilities being affected by a wildfire event is **none**

## Fisher Elementary School, Moore OK





## Heritage Trails Elementary School, Moore OK

Heritage Trails Elementary is part of the Moore school district but the school is located within the city limits of Oklahoma City. The school is surrounded by residential housing on three sides. On the east is a home and farm land. The school grounds are well maintained and the likelihood of a wildfire affecting school facilities is **none**

## Highland East Junior High School, Moore OK



Highland East Junior High School is located in a residential area of Moore. The school is surrounded by family homes and businesses. The likelihood of school facilities being affected by a wildfire event is **none**

## Highland West Junior High School, Moore OK



Highland West Junior High School is located within the city limits of Moore and is surrounded by residential housing. The risk to school facilities from a wildfire event is none.



## Houchin Elementary School, Moore OK



Houchin Elementary School is located within the city limits of Moore and is surrounded by residential homes and businesses. The vulnerability to school facilities from a wildfire event is none





## Kingsgate Elementary School, Moore OK

Kingsgate Elementary School is part of the Moore school district but the school is located within the city limits of Oklahoma City. The school is encompassed by residential housing on all sides and has no exposure to wildland areas. The vulnerability a wildfire will affect school facilities is none

## Moore High School, Moore OK



Moore High School is located within the city limits of the City of Moore and has little to no exposure to wildland fuels. The possibility of wildfire events affecting school facilities is none

## Moore-Norman Technology Center



The Moore-Norman Technology Center is located within the city limits of Norman. The school is located in a rural setting with wildland areas surrounding the campus. Parking lots, roads, and drives create defensible spaces around school facilities. The probability of a wildfire event affecting school facilities is unlikely.



### Northmoor Elementary School, Moore OK

Northmoor Elementary School is located within the city limits of Moore. The school facilities are located in a residential area surrounded by homes and businesses. There is no wildland exposure and the possibility of a wildfire event affecting school facilities is considered none

## Oakridge Elementary School, Moore OK



Oakridge Elementary School is located within the city limits of Moore and is surrounded on two sides by residential housing. Undeveloped land surrounds the south and east sides of the school. The school grounds are well maintained and offer protection from wildfire events. The probability of school facilities being affected by a wildfire event is none

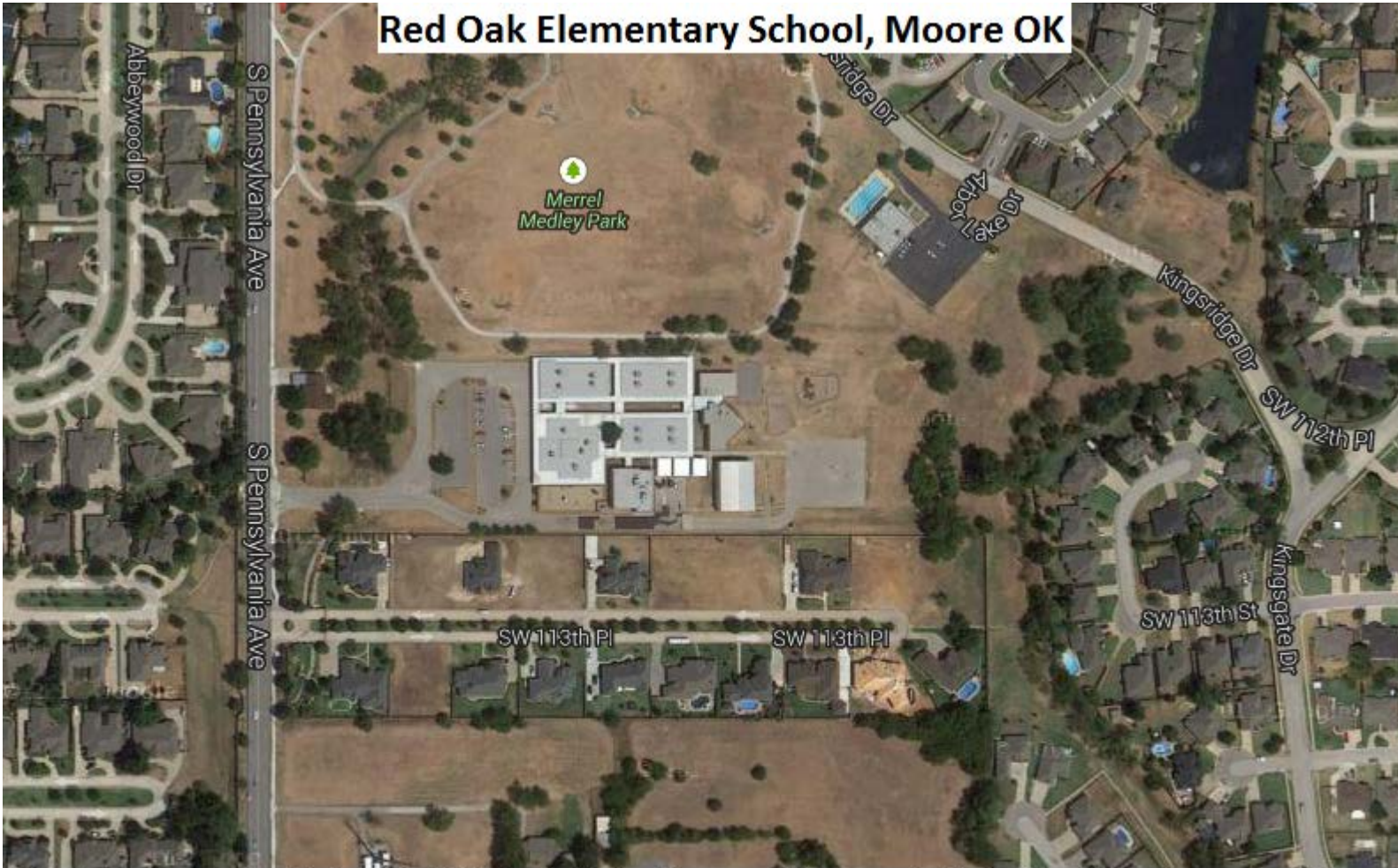
## Plaza Towers Elementary School, Moore OK



Plaza Towers Elementary School is located within the city limits of Moore and surrounded by residential housing. The possibility of school facilities being affected by a wildfire event is none



## Red Oak Elementary School, Moore OK



Red Oak Elementary School is located within the city limits of Moore and is surrounded by residential housing on three sides and a city park on the north side. The school has little to no exposure to wildland properties. The probability of school facilities being affected by a wildfire event is none



### Santa Fe Elementary School, Moore OK

Santa Fe Elementary School is located within the city limits of Moore and is surrounded by residential homes and a church. The school has no exposure to wildland areas and the probability of school facilities being affected by wildfire is none.

## Sky Ranck Elementary School, Moore OK



Sky Ranch Elementary School is part of the Moore school district although it is located within the city limits of Oklahoma City. The school is surrounded by residential homes and has no exposure to wildland areas. The probability of school facilities being affected by wildfire is none

## Sooner Elementary School, Moore OK



Sooner Elementary School is part of the Moore school district but located within the city limits of Oklahoma City. The school is surrounded by residential housing, mobile homes, and businesses. To the south and east of the school campus is undeveloped land. The school property is well maintained and there is a good fire break area between the school facilities and the wildland exposure. The probability of wildfire affecting school facilities is none.

## Southgate-Rippetoe Elementary School, Moore OK



Southgate-Rippetoe Elementary School is located within the city limits of Moore. The school is surrounded by residential housing and has no exposure to wildland areas. The probability of school facilities being affected by a wildfire event is none



### Southmoore High School, Moore OK

Southmoore High School is surrounded by residential homes and acreages. The school property is well maintained and has little to no exposure to wildland fuels. The probability of a wildfire event affecting school facilities is none

## Wayland Bonds Elementary School, Moore OK



Wayland Bonds Elementary is a school within the Moore Public School District but the school is located within the Oklahoma City city limits. The school is surrounded by residential housing on two sides, a church and preschool on the east side and farmland on the south side. The school facilities have little to no exposure to wildland properties and the probability of a wildfire event affecting the school facilities is none.

## West Junior High School, Moore OK



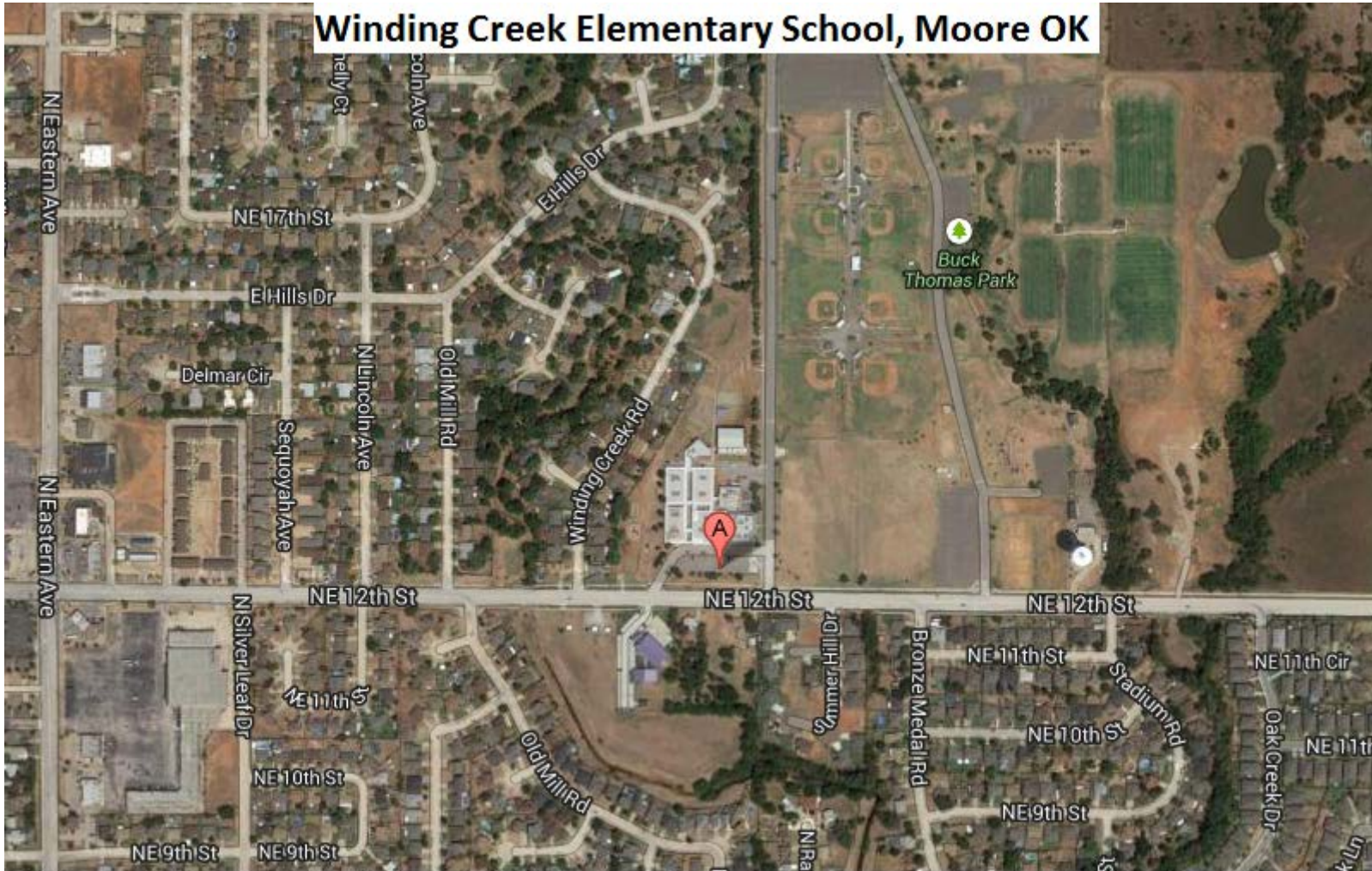
West Junior High School is part of the Moore school district but the school is located within the city limits of Oklahoma City. The school is surrounded by residential homes and businesses. The school facilities have no exposure to wildland areas and the probability of a wildfire event affected school facilities is none





Westmoore High School is part of the Moore PS district but the school is located within the city of Oklahoma City. The school is surrounded by residential homes and businesses. On the north and west side the school has some exposure to wildland areas. The presence of a parking lot and several ball fields provide fire breaks that protect school facilities from the threat of wildfire. The possibility of a wildfire affecting school facilities is none

## Winding Creek Elementary School, Moore OK



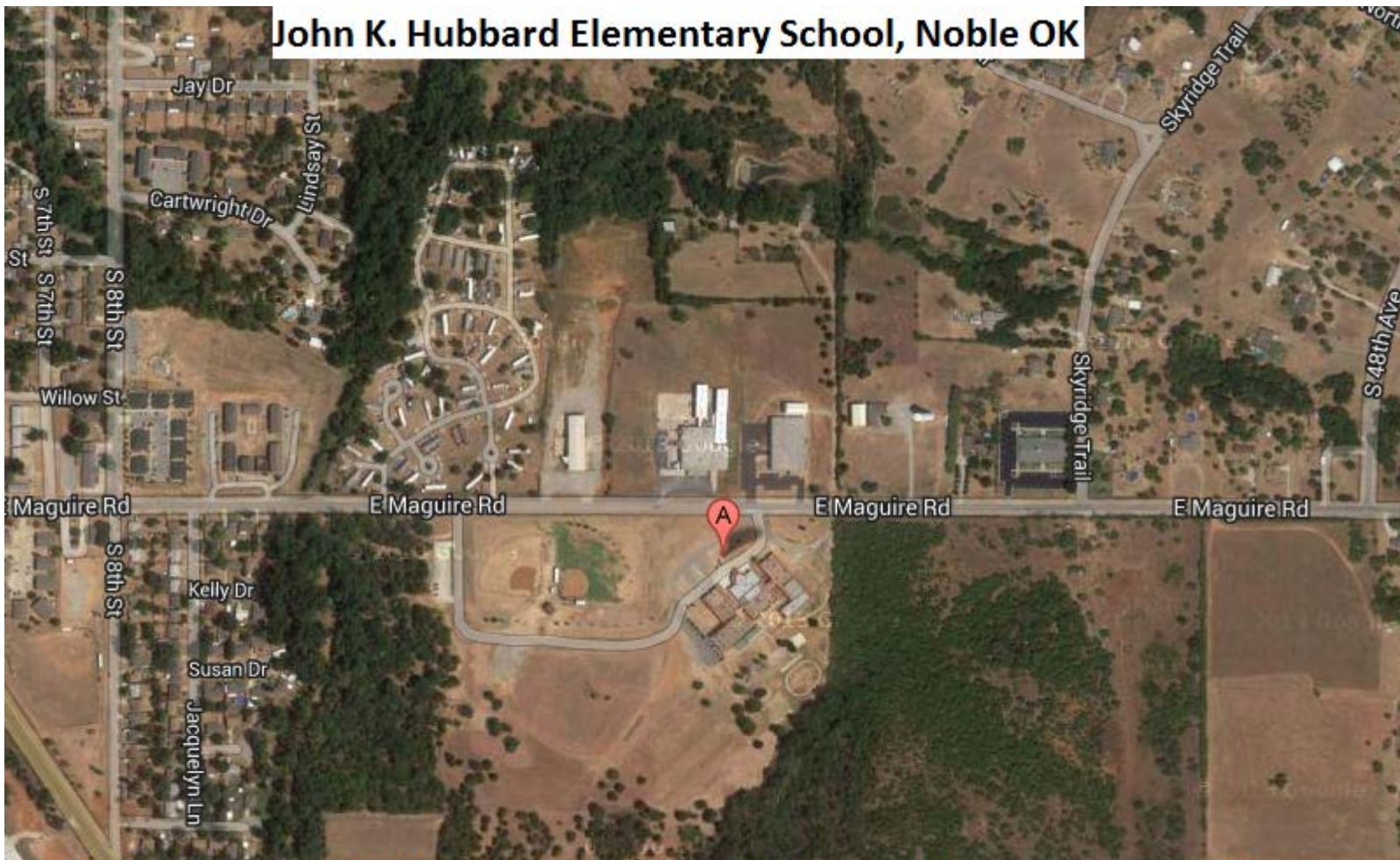
Winding Creek Elementary School is located within the city limits of Moore. A sports complex, church, and residential housing surround the school. The probability a wildfire event will affect school facilities is considered none.

## Curtis Inge Middle School, Noble OK



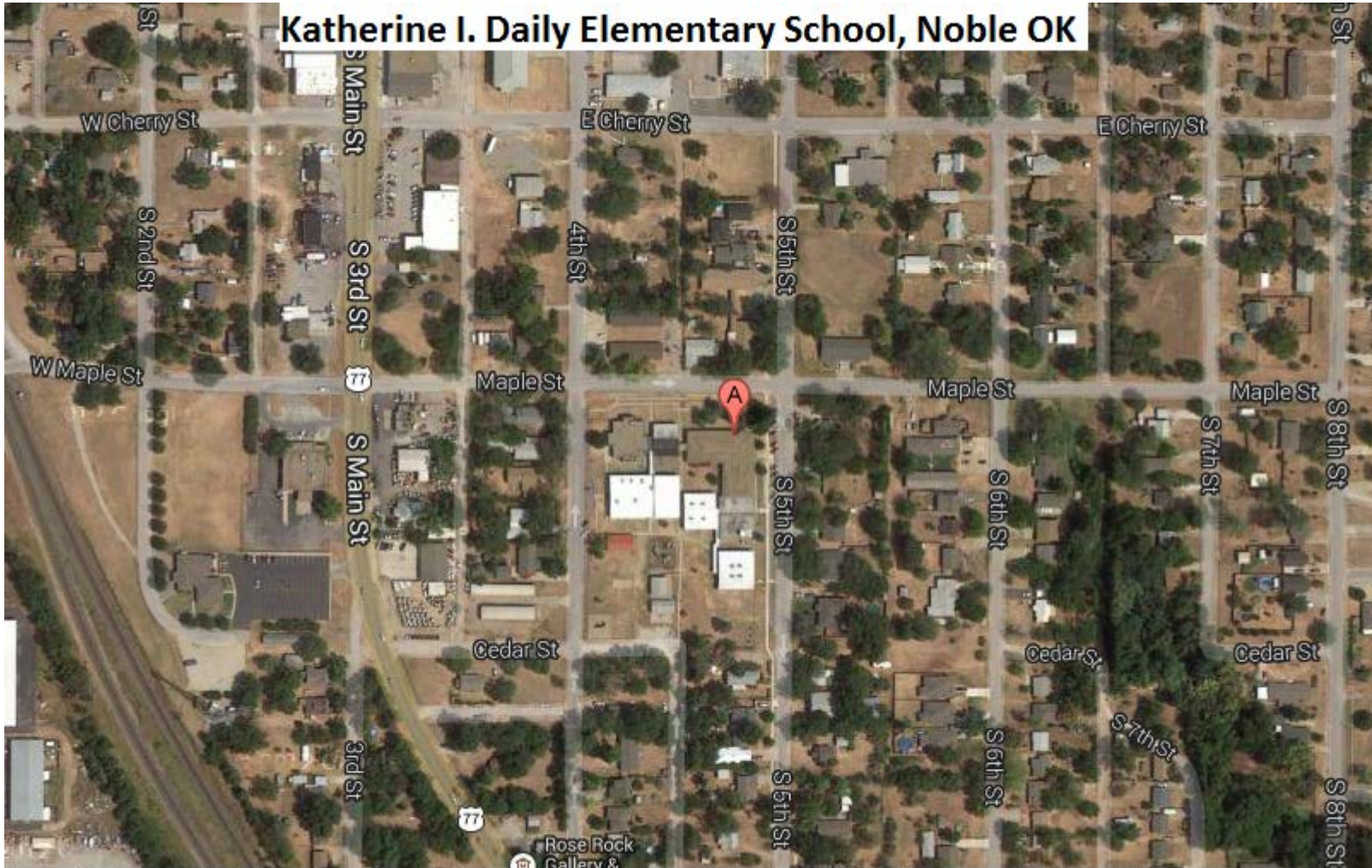
Curtis Inge Middle School is located within the city limits of Noble. The school is bordered on the north and south side by parking lots and drives. N 8th street and residential housing borders the school on the west side. The school grounds on the east side are well maintained with two baseball fields separating school property from farm land. Wildfire from wind blown sparks and ashes is possible but the risk from a wildfire event is considered to be **none**

## John K. Hubbard Elementary School, Noble OK



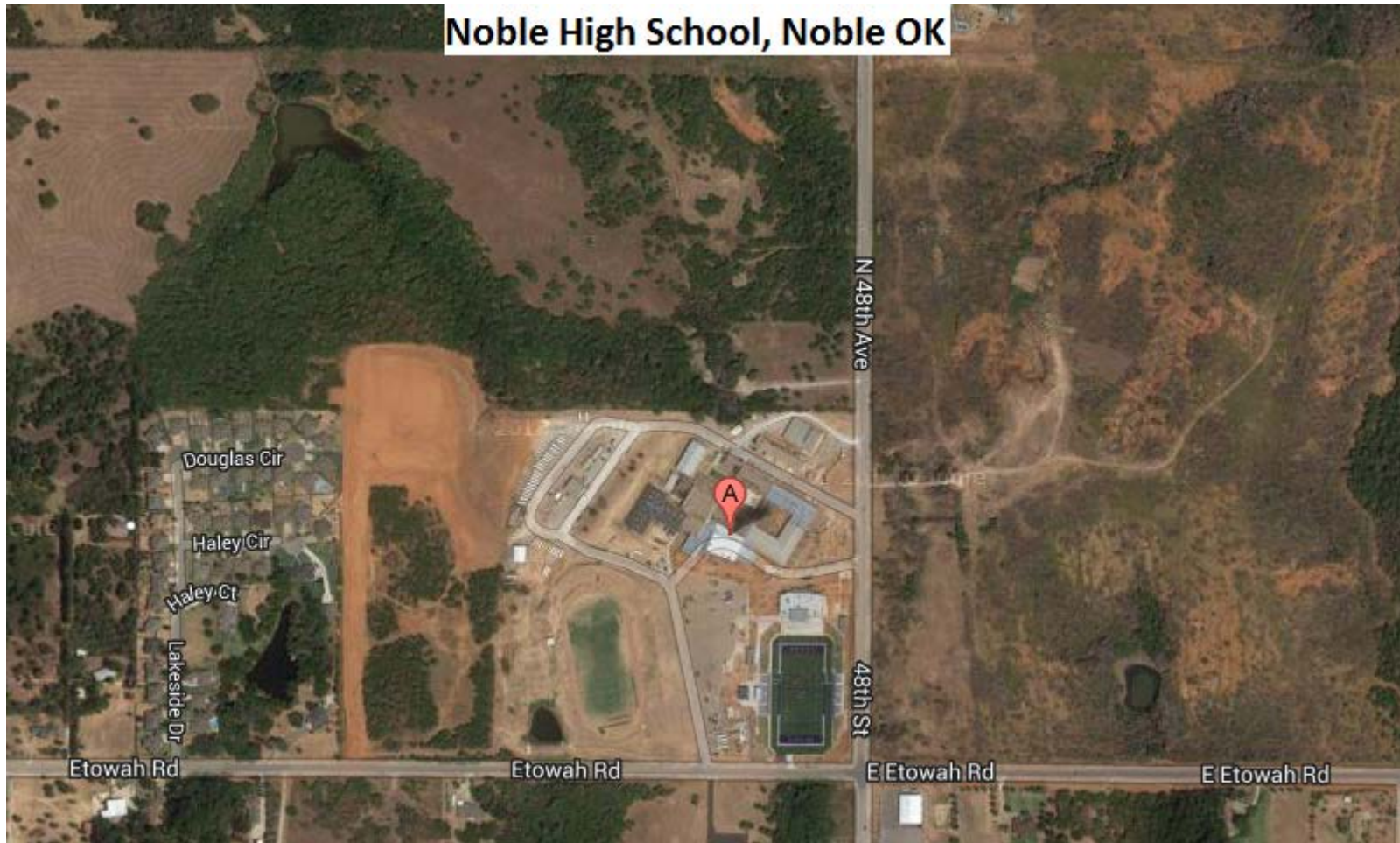
John K. Hubbard Elementary School is located within the city limits of Noble. The school has some exposure to wildland area on the east side of the school grounds. The school grounds are well maintained and provide some protection from wildfire but due to the close proximity of the wildland area to school facilities the vulnerability to wildfire is considered unlikely

## Katherine I. Daily Elementary School, Noble OK

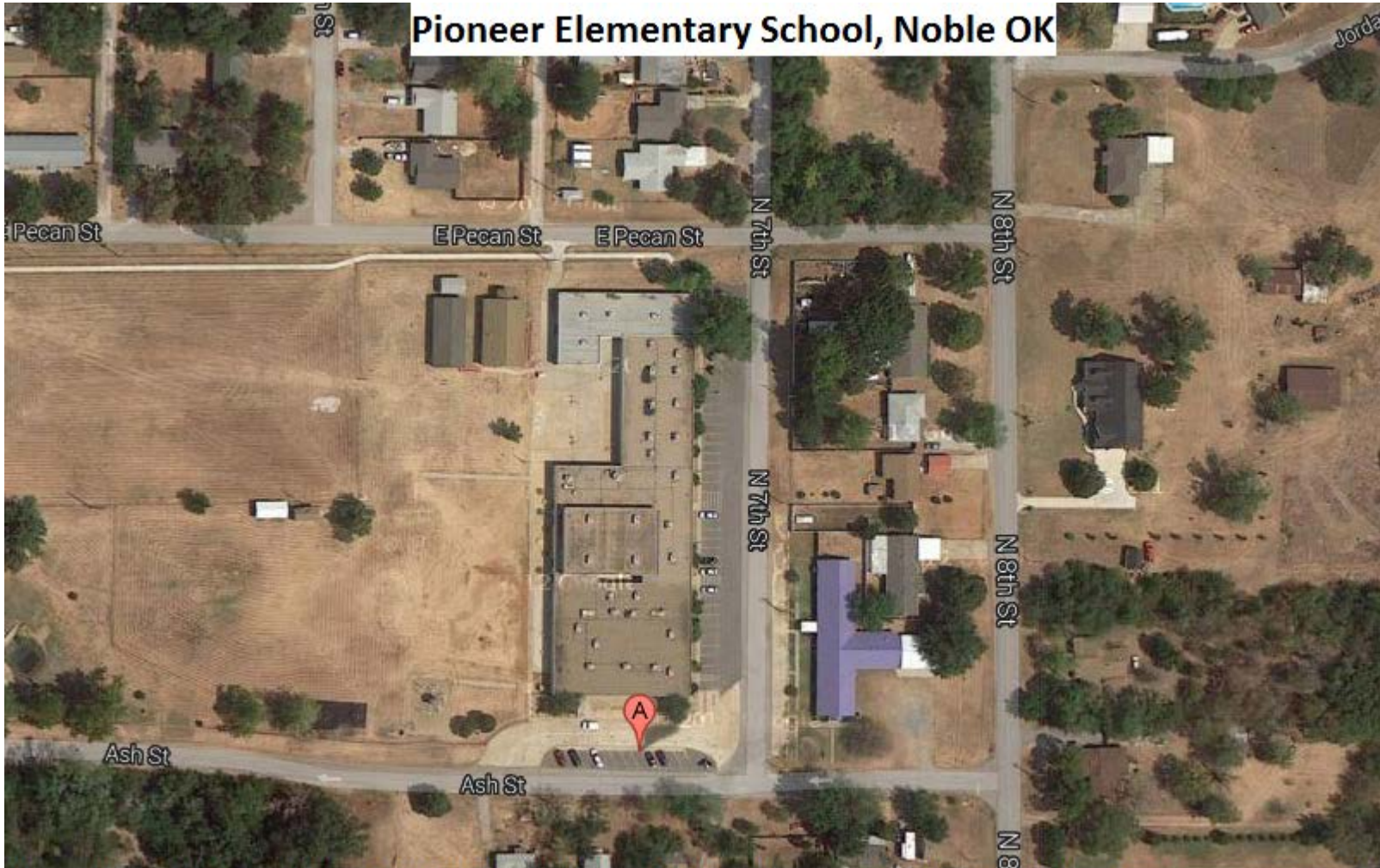


The Katherine I. Daily Elementary School is located within the city limits of Noble and is surrounded by residential homes. The vulnerability of school facilities to wildfire is none

## Noble High School, Noble OK



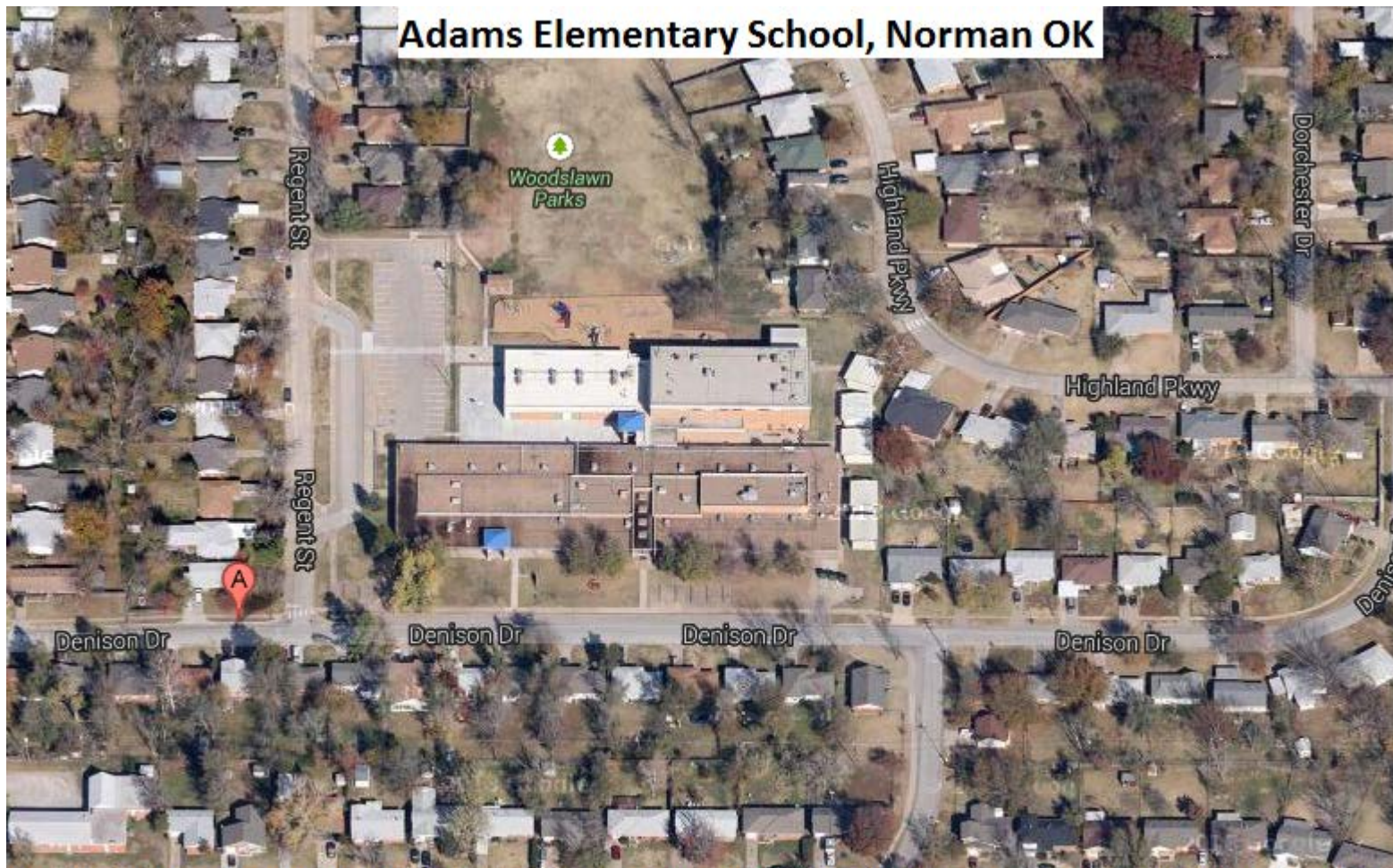
Noble High School is located within the city limits of Noble. The school has exposure to wildland fuels on the north and south sides of the school campus. The school grounds are well maintained which provides some protection from wildfire. The probability of a wildfire event affecting the school facilities is unlikely



**Pioneer Elementary School, Noble OK**

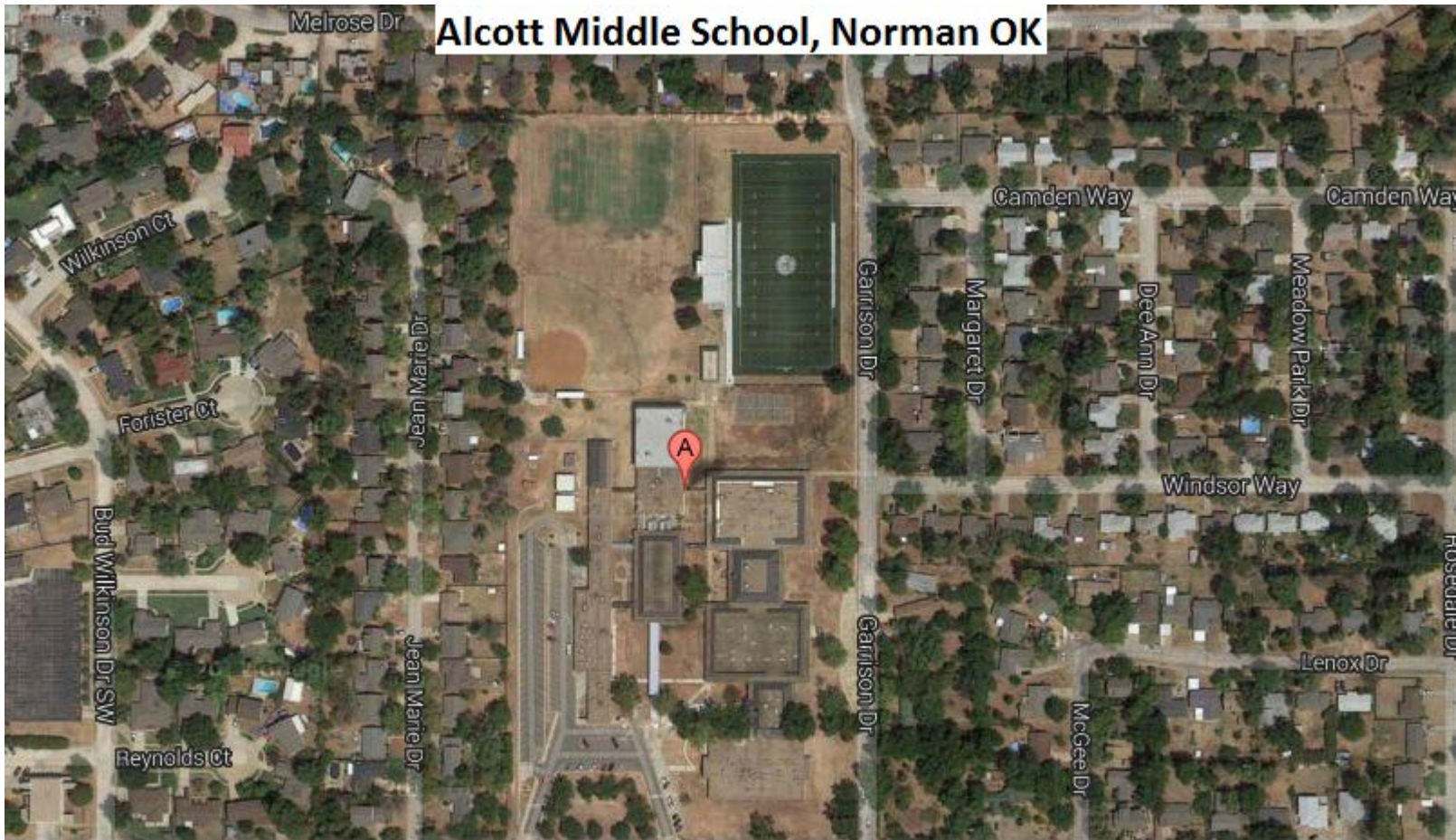
Pioneer Elementary School is located within the city limits of Noble and is surrounded by residential and business properties. The likelihood of a wildfire event affecting school facilities is none

## Adams Elementary School, Norman OK



Adams Elementary School is located within the city limits of Norman and is surrounded by residences. The school facilities have little to no exposure to wildland areas and although wind blown wildfire is possible, the likelihood of a wildfire affecting the school is none

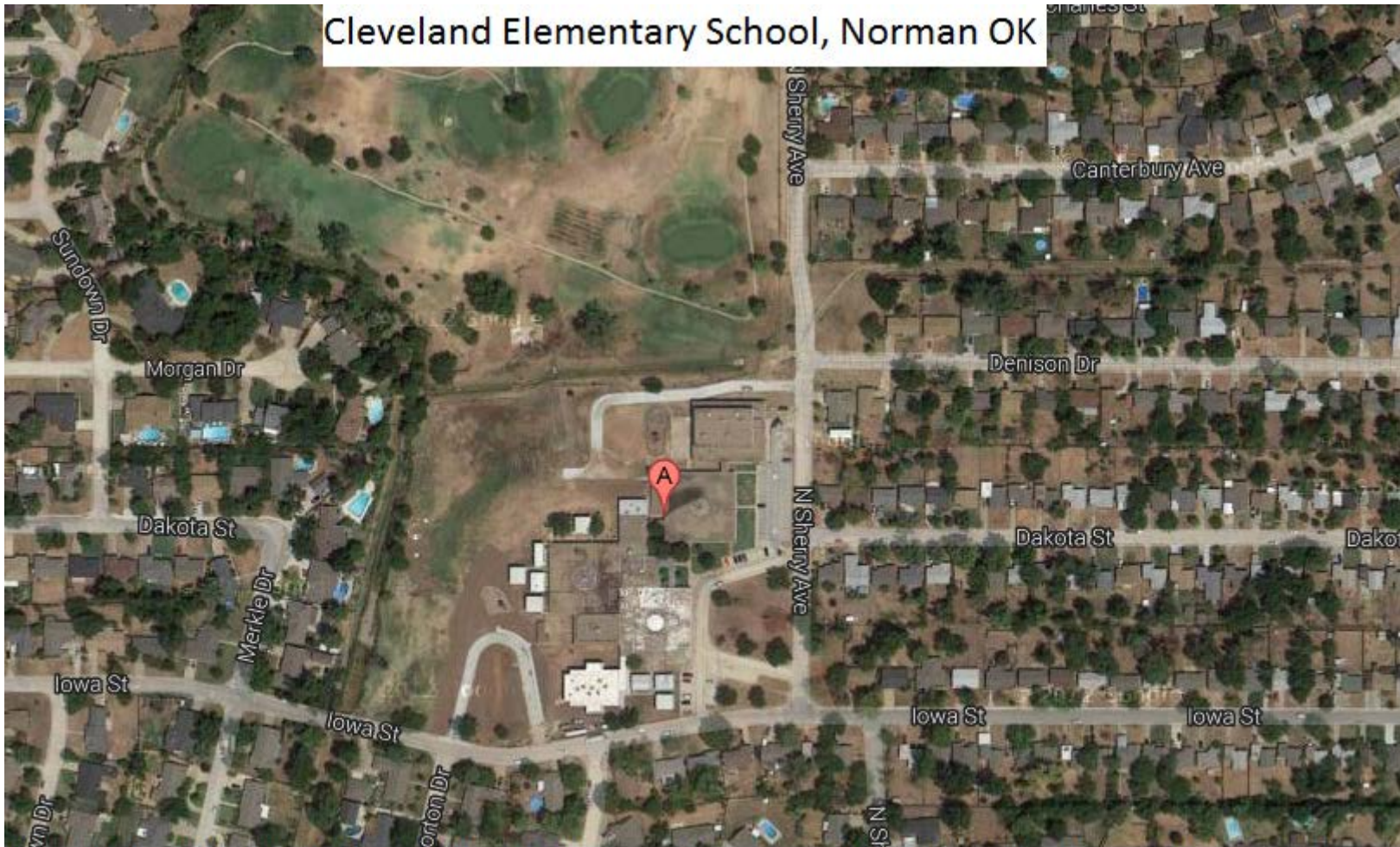




## Alcott Middle School, Norman OK

Alcott Middle School is located within the city limits of Norman and is surrounded by residences. The school facilities have little to no exposure to wildland areas and although wind blown wildfire is possible, the likelihood of a wildfire affecting school facilities is **none**

## Cleveland Elementary School, Norman OK

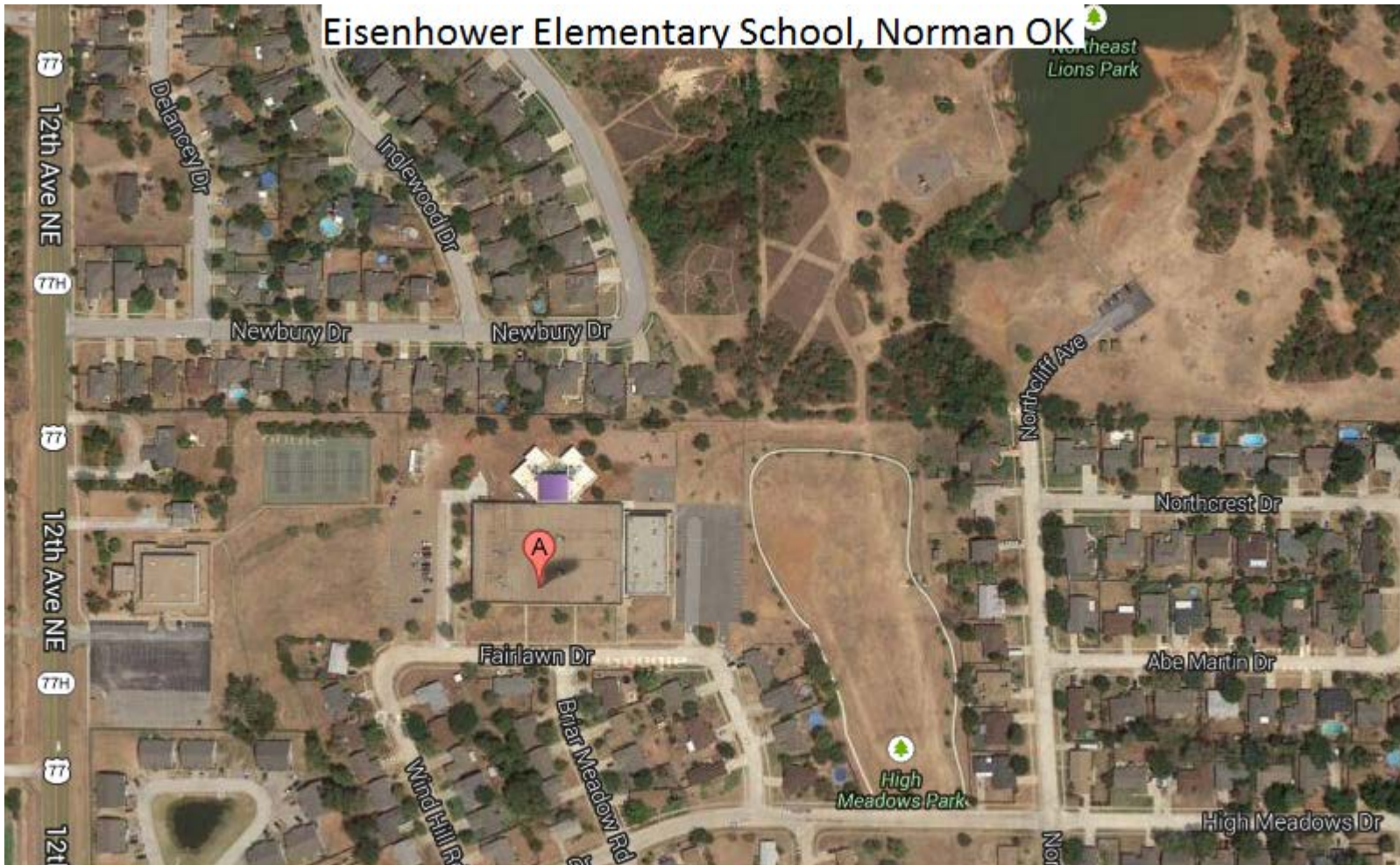


Cleveland Elementary School is located within the city limits of Norman. The school is bordered on three sides by residential properties and by a golf course on the north. The school has little if any exposure to wildland property. Windblown sparks and ashes from a wildfire affecting the school campus is possible but the overall risk to a wildfire event is considered **none**

## Diminsions Academy, Norman OK



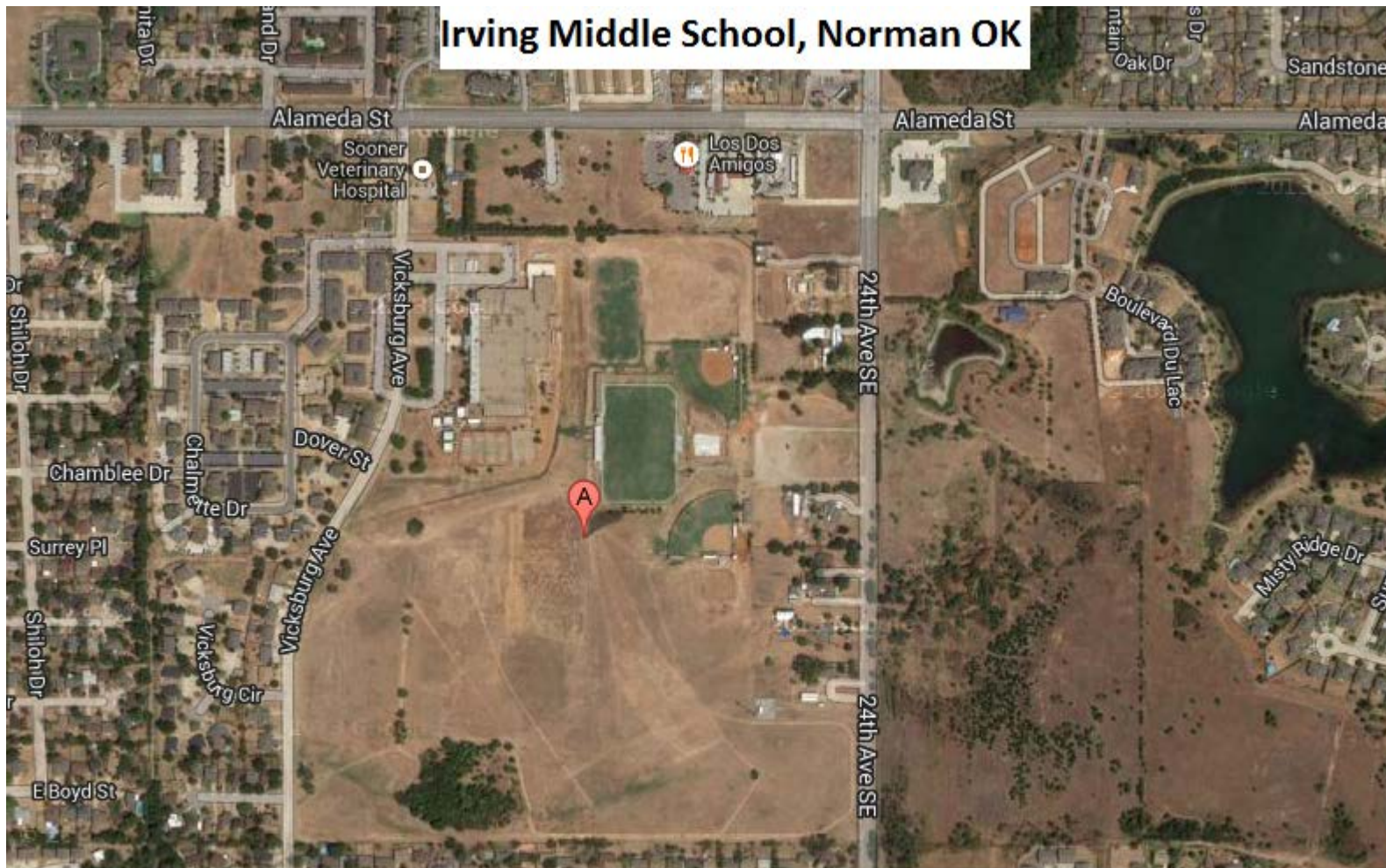
Diminsions Academy Elementary and High School are located within the city limits of Norman. The school is bordered by a hospital and businesses. The school facilities have no exposure to wildland property. The likelihood of the school facilities being involved in a wildfire event is **none**



## Eisenhower Elementary School, Norman OK

Eisenhower Elementary School is located within the City of Norman city limits. The school is surrounded by residential housing on three sides and 12th Ave NE to the west. There is a park north east of the school but it poses no risk to school facilities due to the well maintained school grounds. The likelihood of Eisenhower Elementary being affected by a wildfire event is **none**

## Irving Middle School, Norman OK



Irving Middle School is located within the city limits of Norman and is surrounded by residential housing and businesses on two sides. The school grounds are well kept and provide a wide fire break from the undeveloped land to the east and south. The schools vulnerability to a wildfire event is none

## Jackson Elementary School, Norman OK



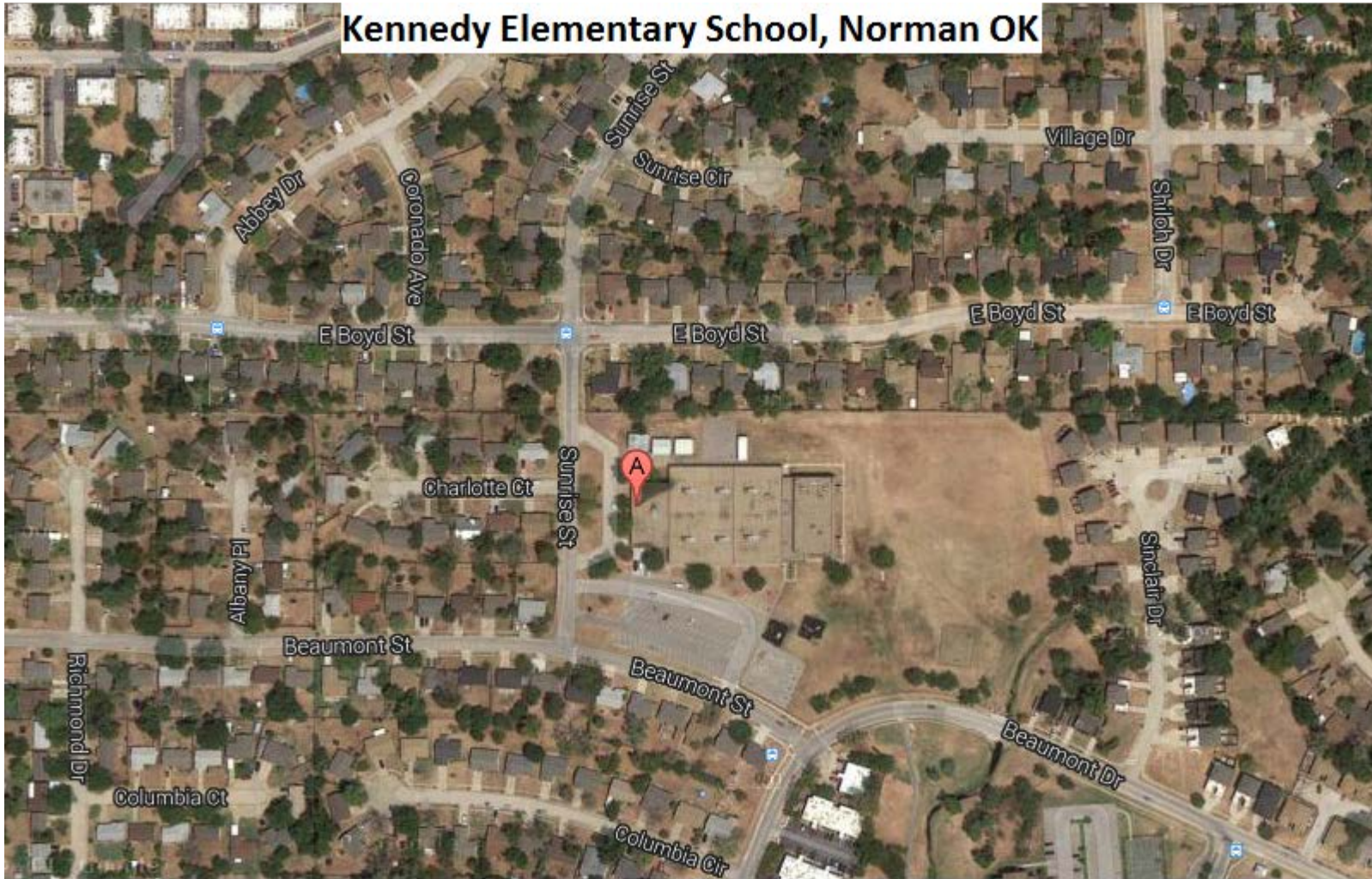
Jackson Elementary School is located within the city limits of Norman. The school is surrounded on three sides by residential housing and a city park on the south. The vulnerability of school facilities to a wildfire event is none

## Jefferson Elementary School, Norman OK



Jefferson Elementary School is located within the city limits of Norman. The school is surrounded by residential homes. The school has no exposure to wildland areas and the vulnerability to wildfire is none

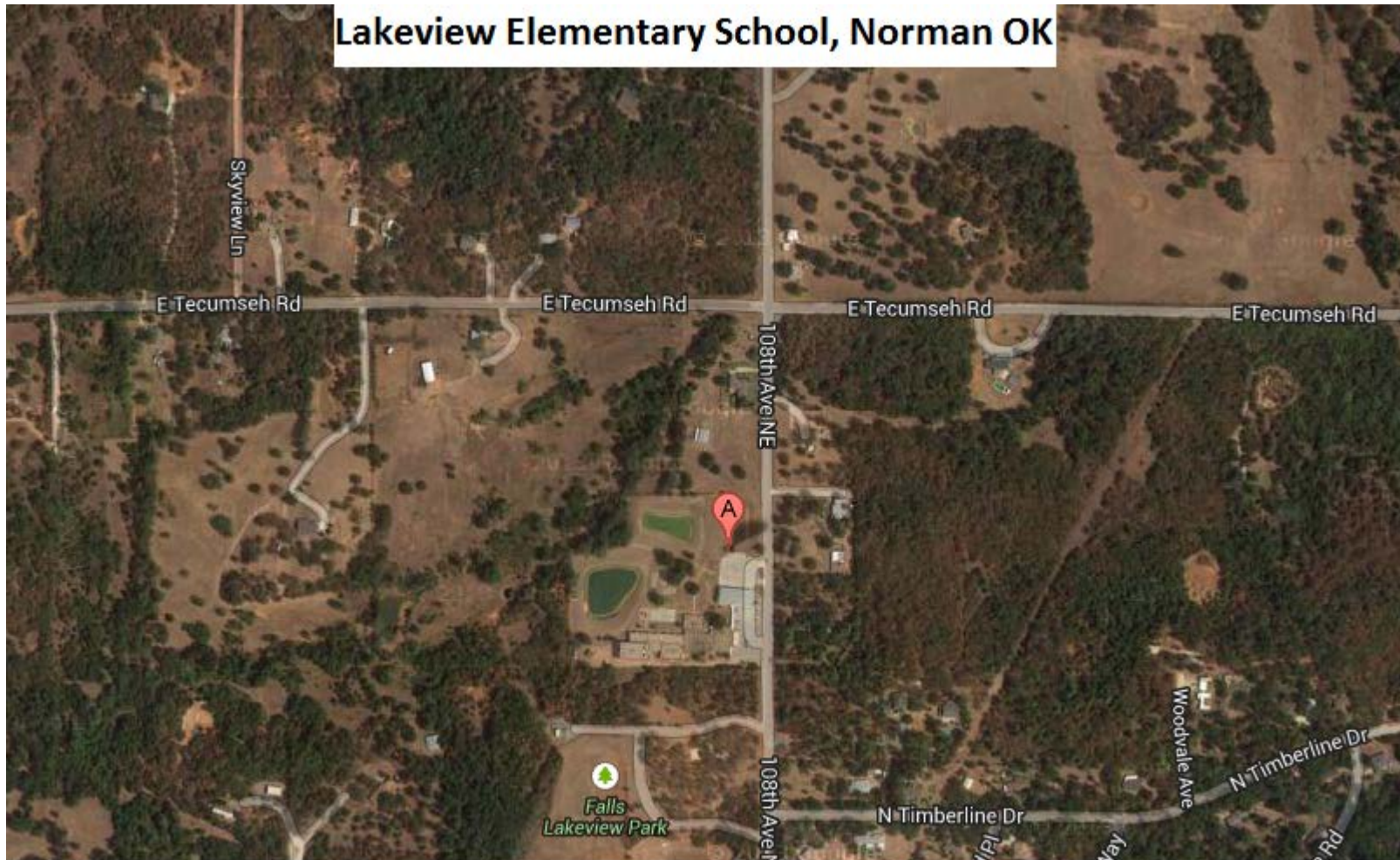
## Kennedy Elementary School, Norman OK



Kennedy Elementary School is located within the city limits of Norman and is surrounded by residential housing. The school has no exposure to wildland areas and the vulnerability to wildfire is none

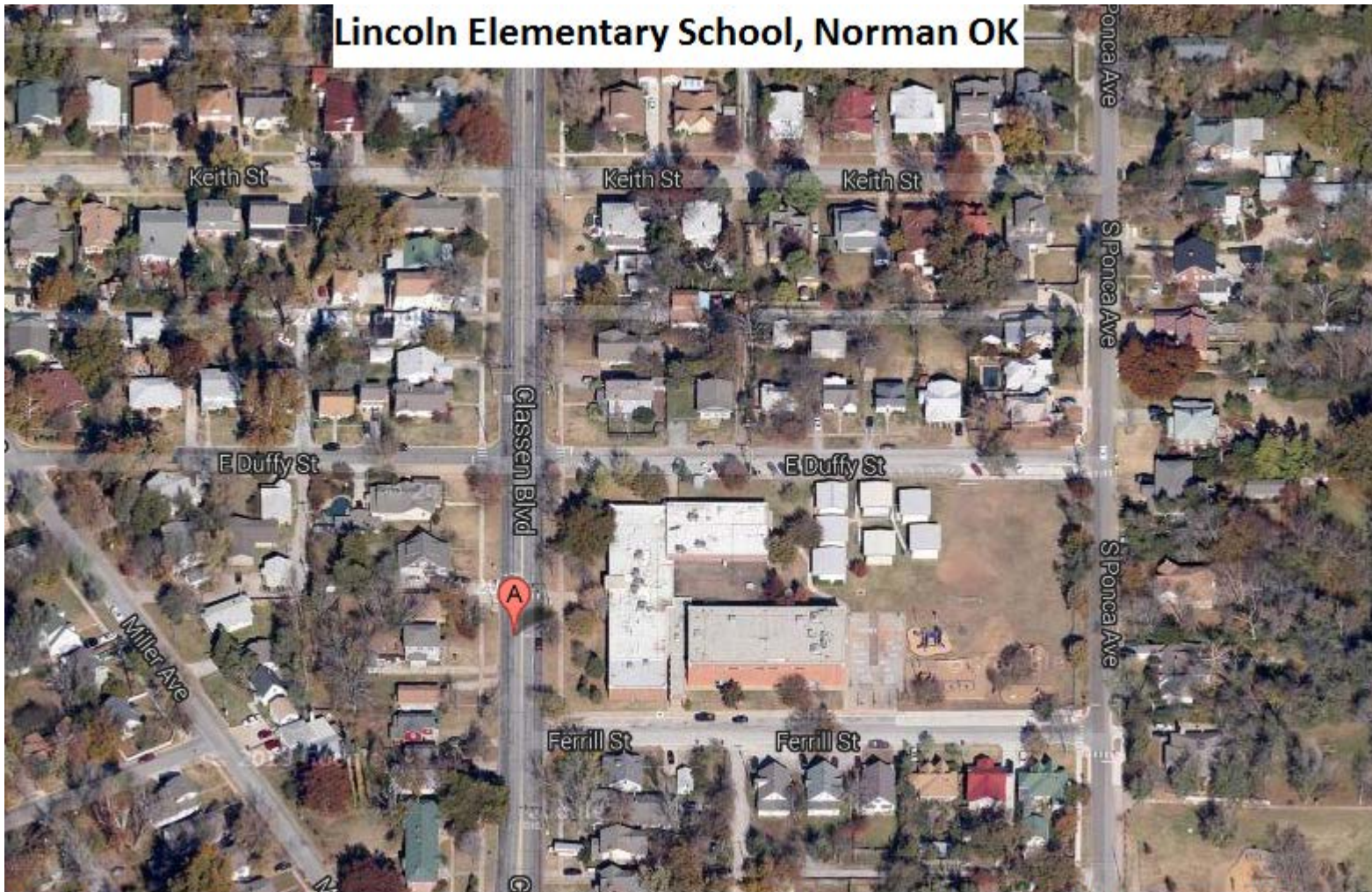


## Lakeview Elementary School, Norman OK



Lakeview Elementary School is located within the city limits of Norma. The school is in a rural area and is surrounded by wildland areas. The school facilities are vulnerable to the threat of wildfire mostly along the south side of the campus. Future vulnerability of school facilities being affected by a wildfire event is unlikely

## Lincoln Elementary School, Norman OK



Lincoln Elementary School is located within the city limits of Norman and is surrounded by residential housing on all sides. The school has no exposure to wildland areas and the school facilities vulnerability to wildfire events is none

## Longfellow Middle School, Norman OK



Longfellow Middle School is located within the city limits of Norman. The school has no exposure to wildland areas and the likelihood school facilities would be affected by a wildfire event is none

## Madison Elementary School, Norman OK



Madison Elementary School is located within the city limits of Norman and is surrounded by residential housing, baseball diamonds, a golf course, and the University of Oklahoma. The school facilities have little to no exposure to wildland fuels and the possibility of school facilities being affected by a wildfire event in none



**McKinley Elementary School, Norman OK**

McKinley Elementary School is located within the city limits of Norman. The school is surrounded by residential homes and has little to no exposure to wildland fuels. The probability of a wildfire affecting the school facilities is none

## Monroe Elementary School, Norman OK



Monroe Elementary School is located within the city limits of Norman and is surrounded by residential housing and Monroe Park on the east. The school facilities have little to no exposure to wildland fuels and the probability of school facilities being affected by a wildfire event is none



## Norman North High School, Norman OK



Norman North High School is located within the city limits of Norman and has very little exposure to wildland fuels located at the NW corner of the campus. A large parking lot separates the school facilities from the wildland area and the possibility of the school facilities being affected by a wildland fire is none



## Roosevelt Elementary School, Norman OK



Roosevelt Elementary School is located within the city limits of Norman and is surrounded by residential housing additions and acreages. The school has little to no exposure to wildland areas. The probability of Robin Hill school facilities being affected by a wildfire event is considered none



Truman Elementary School is located within the city limits of Norman and is surrounded by residential housing and Truman Primary School on the west. The school has no exposure to wildland areas and the probability of school facilities being affected by a wildfire event is none



## Truman Primary School, Norman OK

Truman Primary School is located within the city limits of Norman and surrounded by residential properties and Truman Elementary School on the east side. The school has no exposure to wildland fuels and the probability of school facilities being affected by a wildfire event is none

## Washington Elementary School, Norman OK



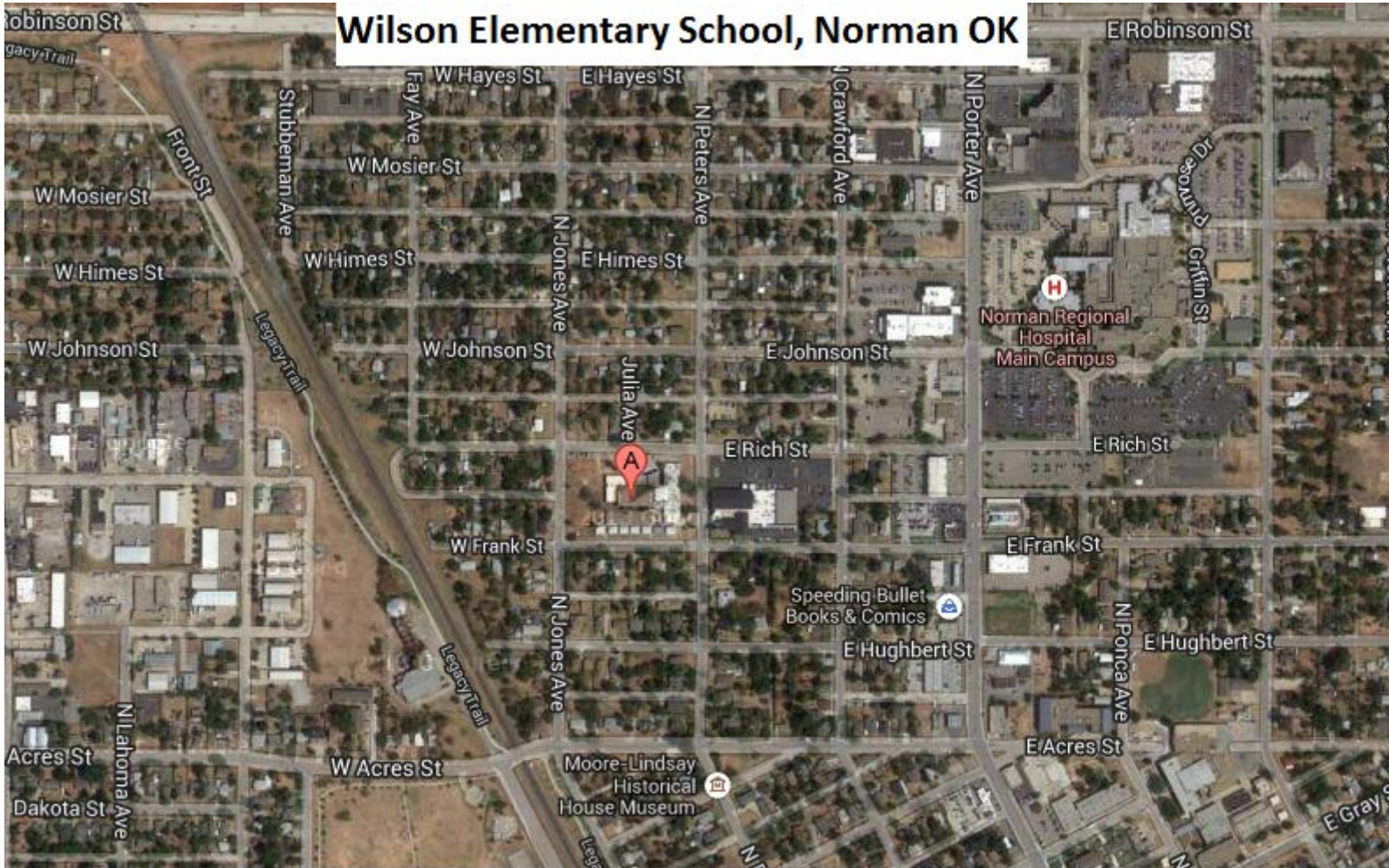
Washington Elementary is located within the city limits of the City of Norman and is located in a rural part of the city. The school grounds are well maintained and surrounded by mostly undeveloped and farmland. The school campus extends beyond the buildings providing a firebreak from the wildland areas. The possibility of a wildfire event affecting school facilities is considered unlikely

## Whittier Middle School, Norman OK

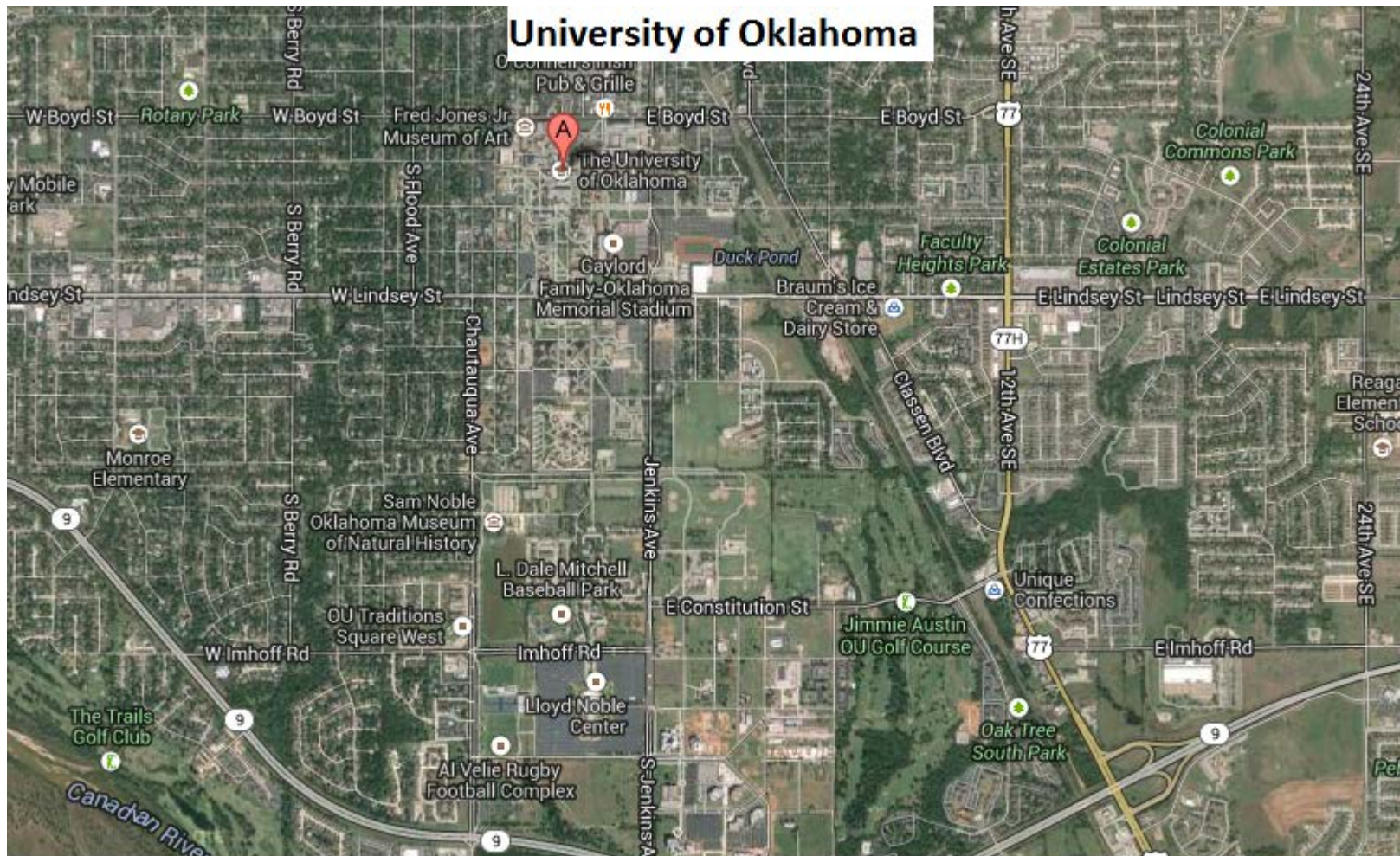


Whittier Middle School is located within the city limits of Norman and is surrounded by residential housing. School facilities have little to no exposure to wildland areas and the likelihood of a wildfire affecting school facilities is none

## Wilson Elementary School, Norman OK



Wilson Elementary School is located within the city limits of Norman. The school is encompassed by residential homes and a church on the east side. The school has no exposure to wildland properties and the probability of a wildfire event affecting school facilities is none



Oklahoma University is located within the city limits of Norman and is surrounded by residential housing, businesses, a golf course, and highway 9 to the south. OU has limited to no exposure to wildland areas and the probability a wildfire will affect school facilities is none

**IDENTIFICATION OF CRITICAL FACILITIES  
AND THEIR VULNERABILITIES**

WHY DO WE DO THIS?

**Instructions in the Federal regulation stipulate:**

***Requirement §201.6(c)(2)(ii) (A):***

**The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas**

***Requirement §201.6(c)(2)(ii) (B):***

**The plan should describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.**



## SO WHAT IS A “CRITICAL FACILITY” ?

### FEDERAL DEFINITION

- Water & wastewater treatment plants
- Power generating plants
- Hazardous waste sites
- Major infrastructure
- Hospitals
- Emergency shelters
- Fire/police stations
- Government buildings
- Libraries
- Daycare centers
- Retirement homes
- Schools
- Cultural resources
- Historic sites
- Grocery stores
- Fuel stations
- Pharmacies
- Airports

## WE DECIDE WHAT FACILITIES ARE IMPORTANT TO US:

- Emergency response agencies
- Governmental offices and properties
- Health care providers
- Resources (for services and supplies in a crisis)
- What keeps our government going?
- Where do we put the injured?
- What agencies take care of personal needs?
- Short-term vs. long-term needs
- What else?



## THEN CATEGORIZE OUR PRIORITIES:

- Emergency response:
  - Fire / law enforcement / EMS
- Government:
  - Primary seat of government; historical sites
- Health care providers:
  - Hospitals, pharmacies, clinics
- Resources:
  - Wal-Mart, lumber yards, voluntary agencies
- Infrastructure, transport
  - Utilities, roads, bridges

Vulnerability is calculated using the “Potential Damage” estimations and the “Table of Probability vs. Impact.” The chart shown here illustrates the potential vulnerability of structures based upon their location, age and type of construction. Some hazards have little impact on structures (e.g., drought, extreme heat), while other hazards have an enormous impact (e.g., high winds, tornados). For instance, a wood structure over 50 years old, located in a rural setting has a much greater vulnerability to wildfire than if it were located in a metropolitan setting. However, if that were a brick structure in the same setting, the vulnerability would be less significant.

| LOCATION: METROPOLITAN |                  |          |          |          |          |
|------------------------|------------------|----------|----------|----------|----------|
| Type construction      | Less than 10 yrs | < 30 yrs | < 50 yrs | > 50 yrs | > 75 yrs |
| Wood                   | 20%              | 30%      | 50%      | 75%      | 90%      |
| Metal                  | 15%              | 25%      | 40%      | 65%      | 90%      |
| Masonry /concrete      | 10%              | 20%      | 35%      | 60%      | 70%      |
| Brick                  | 10%              | 20%      | 35%      | 50%      | 60%      |

| LOCATION: URBAN   |                  |          |          |          |          |
|-------------------|------------------|----------|----------|----------|----------|
| Type construction | Less than 10 yrs | < 30 yrs | < 50 yrs | > 50 yrs | > 75 yrs |
| Wood              | 20%              | 30%      | 50%      | 75%      | 90%      |
| Metal             | 15%              | 25%      | 40%      | 65%      | 90%      |
| Masonry /concrete | 10%              | 20%      | 35%      | 60%      | 70%      |
| Brick             | 10%              | 20%      | 35%      | 50%      | 60%      |

| LOCATION: RURAL   |                  |          |          |          |          |
|-------------------|------------------|----------|----------|----------|----------|
| Type construction | Less than 10 yrs | < 30 yrs | < 50 yrs | > 50 yrs | > 75 yrs |
| Wood              | 20%              | 30%      | 50%      | 75%      | 90%      |
| Metal             | 15%              | 25%      | 40%      | 65%      | 90%      |
| Masonry /concrete | 10%              | 20%      | 35%      | 60%      | 70%      |
| Brick             | 10%              | 20%      | 35%      | 50%      | 60%      |

Using the determinations of the probability of each identified hazard, the impact of the loss of that facility is then calculated. The combination of the two factors produces the likely impact of a specific hazard upon that same structure. Although the probability of a hazard affecting a specific structure may be high, but the impact of damage or loss is low, then the overall impact is ranked in a lower category. The Table of Probability vs. Impact is also shown here.

Estimated values of structures, contents, infrastructure and other identified resources are provided through local assessors and insurers.

| PROBABILITY OF AN EVENT    | PROBABILITY vs. IMPACT   |  |          |  |        |  |         |  |
|----------------------------|--------------------------|--|----------|--|--------|--|---------|--|
|                            | Highly Likely<br>70-100% |  |          |  |        |  |         |  |
| Likely<br>50-70%           |                          |  |          |  |        |  |         |  |
|                            |                          |  |          |  |        |  |         |  |
| Possible<br>30-50%         |                          |  |          |  |        |  |         |  |
|                            |                          |  |          |  |        |  |         |  |
| Unlikely<br>10-30%         |                          |  |          |  |        |  |         |  |
|                            |                          |  |          |  |        |  |         |  |
| POTENTIAL DEGREE OF IMPACT | Minimum                  |  | Moderate |  | Major  |  | Total   |  |
|                            | 10-30%                   |  | 30-50%   |  | 50-70% |  | 70-100% |  |

## Appendix C – Critical Facilities - Lexington

| CRITICAL FACILITY IDENTIFICATION                                                 |  |                                                | FACILITY NAME:                                                        |                                  |                      |                  |
|----------------------------------------------------------------------------------|--|------------------------------------------------|-----------------------------------------------------------------------|----------------------------------|----------------------|------------------|
| FACILITY LOCATION:                                                               |  |                                                | Lexington Family Worship Center and Sunshine Free Holiness Tabernacle |                                  |                      |                  |
| 951 North Main, Lexington                                                        |  |                                                | COUNTY: Cleveland                                                     |                                  |                      |                  |
| Latitude:                                                                        |  | 35° 1' 15.0366                                 | Longitude:                                                            |                                  | 97° 20' 10.2804      |                  |
| WHY CRITICAL:                                                                    |  |                                                |                                                                       |                                  |                      |                  |
| <input type="checkbox"/> Emergency Service                                       |  | <input checked="" type="checkbox"/> Government | <input type="checkbox"/> Health Service                               | <input type="checkbox"/> Utility | Resource             | X Other          |
| ABOUT THE STRUCTURE: Vulnerability due to location, age and type of construction |  |                                                |                                                                       |                                  |                      |                  |
| Location:                                                                        |  | Year built:                                    | Stories:                                                              | Type of Construction:            | Square Feet:         | Potential Loss % |
|                                                                                  |  | 2009                                           | 1                                                                     | Metal/Wood                       | 5,730.00             | 25%              |
| SFHA                                                                             |  | Building value: \$523,511                      |                                                                       | Contents value: \$321,000        |                      |                  |
|                                                                                  |  |                                                |                                                                       |                                  |                      |                  |
|                                                                                  |  | <b>Probability of this risk?</b>               | <b>Degree of Impact</b>                                               | <b>Percent of loss</b>           | <b>Value of loss</b> | <b>NOTES</b>     |
| <b>Dam Failure</b>                                                               |  | 0%                                             | 0%                                                                    | 0.00%                            | 0                    |                  |
| <b>Drought</b>                                                                   |  | 50%                                            | 10%                                                                   | 30.00%                           | 253,353              |                  |
| <b>Earthquake</b>                                                                |  | 50%                                            | 40%                                                                   | 45.00%                           | 380,030              |                  |
| <b>Extreme heat</b>                                                              |  | 70%                                            | 10%                                                                   | 40.00%                           | 337,804              |                  |
| <b>Flooding</b>                                                                  |  | 50%                                            | 40%                                                                   | 45.00%                           | 380,030              |                  |
| <b>Hail</b>                                                                      |  | 70%                                            | 20%                                                                   | 45.00%                           | 380,030              |                  |
| <b>High winds</b>                                                                |  | 50%                                            | 30%                                                                   | 40.00%                           | 337,804              |                  |
| <b>Lightning</b>                                                                 |  | 50%                                            | 20%                                                                   | 35.00%                           | 295,579              |                  |
| <b>Tornado</b>                                                                   |  | 70%                                            | 90%                                                                   | 80.00%                           | 675,609              |                  |
| <b>Wildfires</b>                                                                 |  | 20%                                            | 60%                                                                   | 40.00%                           | 337,804              |                  |
| <b>Winter storms</b>                                                             |  | 60%                                            | 40%                                                                   | 50.00%                           | 422,256              |                  |
| <i>Hazard Mitigation Specialists, LLC</i>                                        |  |                                                |                                                                       |                                  |                      |                  |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Lexington Fire Dept #1   |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        | 123 E Broadway, Lexington                                   |                                     | COUNTY:                                 | Cleveland                        |                                   |                                |
|                                           | Latitude:                                                   | 35° 1' 2.4175                       | Longitude:                              | 97° 20' 8.2914                   |                                   |                                |
| WHY CRITICAL:                             | <input checked="" type="checkbox"/> Emergency Service       | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Potential Loss %                  |                                |
|                                           | 2006                                                        | 1                                   | Steel span / metal                      | 2,000.00                         | 10%                               |                                |
| SFHA                                      | Building value:                                             | \$100,000                           |                                         | Contents value:                  | \$300,000                         |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                  | <b>Value of loss</b>             | <b>NOTES</b>                      |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                  | 120,000                          |                                   |                                |
| Earthquake                                | 50%                                                         | 40%                                 | 45.00%                                  | 180,000                          |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                  | 160,000                          |                                   |                                |
| Flooding                                  | 50%                                                         | 40%                                 | 45.00%                                  | 180,000                          |                                   |                                |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                  | 180,000                          |                                   |                                |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                  | 160,000                          |                                   |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                  | 140,000                          |                                   |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                  | 320,000                          |                                   |                                |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                  | 160,000                          |                                   |                                |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                  | 200,000                          |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                         |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Lexington Fire Dept #2   |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 14280 SH 39, Lexington              |                                         | COUNTY: Cleveland                |                                   |                                |
|                                           | Latitude:                                                   | 35° 0' 53.906"                      | Longitude:                              |                                  | -97° 10' 0.444"                   |                                |
| WHY CRITICAL:                             | <input checked="" type="checkbox"/> Emergency Service       | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Potential Loss %                  |                                |
|                                           | 2012                                                        | 1                                   | Steel span / metal                      | 3,200.00                         | 15%                               |                                |
| SFHA                                      | Building value:                                             | \$60,000                            |                                         | Contents value:                  | \$175,000                         |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                  | <b>Value of loss</b>             | <b>NOTES</b>                      |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                  | 70,500                           |                                   |                                |
| Earthquake                                | 50%                                                         | 40%                                 | 45.00%                                  | 105,750                          |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                  | 94,000                           |                                   |                                |
| Flooding                                  | 50%                                                         | 40%                                 | 45.00%                                  | 105,750                          |                                   |                                |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                  | 105,750                          |                                   |                                |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                  | 94,000                           |                                   |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                  | 82,250                           |                                   |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                  | 188,000                          |                                   |                                |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                  | 94,000                           |                                   |                                |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                  | 117,500                          |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                         |                                  |                                   |                                |


| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Lexington Gas & Go       |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        | 326 West Broadway, Lexington                                |                                     | COUNTY:                                 | Cleveland                        |                                              |                                |
|                                           | Latitude:                                                   | 35° 0'52.8296                       | Longitude:                              | 97° 20' 23.852                   |                                              |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Potential Loss %                             |                                |
|                                           | 2002                                                        | 1                                   | Metal                                   | 3,462.00                         | 25%                                          |                                |
| SFHA                                      | Building value:                                             | \$407,617                           |                                         | Contents value:                  | \$357,858                                    |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                  | <b>Value of loss</b>             | <b>NOTES</b>                                 |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                  | 229,643                          |                                              |                                |
| Earthquake                                | 50%                                                         | 40%                                 | 45.00%                                  | 344,464                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                  | 306,190                          |                                              |                                |
| Flooding                                  | 50%                                                         | 40%                                 | 45.00%                                  | 344,464                          |                                              |                                |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                  | 344,464                          |                                              |                                |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                  | 306,190                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                  | 267,916                          |                                              |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                  | 612,380                          |                                              |                                |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                  | 306,190                          |                                              |                                |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                  | 382,738                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                         |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Lexington Nursing Home              |                                  |                  |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|------------------|
| FACILITY LOCATION:                        |                                                             | 623 Southeast 3rd                   |                                                    | COUNTY: Cleveland                |                  |
|                                           | Latitude:                                                   | 35° 0' 23.9904                      |                                                    | Longitude:                       | 97° 19' 52.748   |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | Resource Other   |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                  |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Potential Loss % |
|                                           | 1977                                                        | 1                                   | Brick                                              | 21,006.00                        | 45%              |
| SFHA                                      | Building value:                                             | \$178,004                           |                                                    | Contents value:                  | \$356,044        |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                             | <b>Value of loss</b>             | <b>NOTES</b>     |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                              | 0                                |                  |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                             | 160,214                          |                  |
| Earthquake                                | 50%                                                         | 40%                                 | 45.00%                                             | 240,322                          |                  |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                             | 213,619                          |                  |
| Flooding                                  | 50%                                                         | 40%                                 | 45.00%                                             | 240,322                          |                  |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                             | 240,322                          |                  |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                             | 213,619                          |                  |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                             | 186,917                          |                  |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                             | 427,238                          |                  |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                             | 213,619                          |                  |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                             | 267,024                          |                  |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                    |                                  |                  |



| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: One East Convenience Store |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-------------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 8380 St Highway 39                  |                                           | COUNTY: Cleveland                |                                              |                                |
|                                           | Latitude:                                                   | 35° 0' 53.2602                      |                                           | Longitude:                       | 97° 20' 8.1006                               |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service   | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                           |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                     | Square Feet:                     | Potential Loss %                             |                                |
|                                           | 1983                                                        | 1                                   | Metal                                     | 1,467.00                         | 25%                                          |                                |
| SFHA                                      | Building value:                                             | \$84,664                            |                                           | Contents value:                  | \$169,328                                    |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                    | <b>Value of loss</b>             | <b>NOTES</b>                                 |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                     | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 0.00%                                     | 0                                |                                              |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                    | 88,897                           |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                    | 101,597                          |                                              |                                |
| Flooding                                  | 50%                                                         | 30%                                 | 40.00%                                    | 101,597                          |                                              |                                |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                    | 114,296                          |                                              |                                |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                    | 101,597                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                    | 88,897                           |                                              |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                    | 203,194                          |                                              |                                |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                    | 101,597                          |                                              |                                |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                    | 126,996                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                           |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Pearsons Lumber Yard     |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 116 NW 4th, Lexington               |                                         | COUNTY: Cleveland                |                                              |                                |
|                                           | Latitude:                                                   | 35° 0' 56.6028                      |                                         | Longitude:                       | 97° 20' 27.4848                              |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Potential Loss %                             |                                |
|                                           | 1950                                                        | 1                                   | Wood                                    | 21,266.00                        | 90%                                          |                                |
| SFHA                                      | Building value:                                             | \$132,168                           |                                         | Contents value:                  | \$264,336                                    |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                  | <b>Value of loss</b>             | <b>NOTES</b>                                 |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 0.00%                                   | 0                                |                                              |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                  | 138,776                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                  | 158,602                          |                                              |                                |
| Flooding                                  | 50%                                                         | 30%                                 | 40.00%                                  | 158,602                          |                                              |                                |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                  | 178,427                          |                                              |                                |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                  | 158,602                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                  | 138,776                          |                                              |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                  | 317,203                          |                                              |                                |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                  | 158,602                          |                                              |                                |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                  | 198,252                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                         |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION   |                                                             |                                     | FACILITY NAME: Lexington Police Dept.   |                                  |                                                                                      |
|------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|--------------------------------------------------------------------------------------|
| FACILITY LOCATION:                 |                                                             | 121 East Broadway                   |                                         | COUNTY: Cleveland                |                                                                                      |
|                                    | Latitude:                                                   | 35° 0' 55.1772                      |                                         | Longitude:                       | 97° 20' 5.5572                                                                       |
| WHY CRITICAL:                      | <input checked="" type="checkbox"/> Emergency Service       | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource <input type="checkbox"/> Other                     |
| ABOUT THE STRUCTURE:               | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                                                                      |
| Location:                          | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Potential Loss %                                                                     |
|                                    | <1960                                                       | 2                                   | Frame                                   | 1,200.00                         | 75%                                                                                  |
| SFHA                               | Building value:                                             | \$58,000                            |                                         | Contents value:                  | \$37,000                                                                             |
|                                    | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                         | Value of loss                    | NOTES                                                                                |
| Dam Failure                        | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                                                                      |
| Drought                            | 50%                                                         | 10%                                 | 10.00%                                  | 9,500                            |  |
| Earthquake                         | 50%                                                         | 60%                                 | 20.00%                                  | 19,000                           |                                                                                      |
| Extreme heat                       | 70%                                                         | 10%                                 | 10.00%                                  | 9,500                            |                                                                                      |
| Flooding                           | 50%                                                         | 60%                                 | 30.00%                                  | 28,500                           |                                                                                      |
| Hail                               | 70%                                                         | 20%                                 | 20.00%                                  | 19,000                           |                                                                                      |
| High winds                         | 50%                                                         | 40%                                 | 30.00%                                  | 28,500                           |                                                                                      |
| Lightning                          | 50%                                                         | 20%                                 | 20.00%                                  | 19,000                           |                                                                                      |
| Tornado                            | 70%                                                         | 90%                                 | 90.00%                                  | 85,500                           |                                                                                      |
| Wildfires                          | 20%                                                         | 60%                                 | 60.00%                                  | 57,000                           |                                                                                      |
| Winter storms                      | 60%                                                         | 40%                                 | 40.00%                                  | 38,000                           |                                                                                      |
| Hazard Mitigation Specialists, LLC |                                                             |                                     |                                         |                                  |                                                                                      |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Riverside Convenience Store |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|--------------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 401 US Highway 77                   |                                            | COUNTY: Cleveland                |                                              |                                |
|                                           | Latitude:                                                   | 35°3' 23.3712                       |                                            | Longitude:                       | 97°20' 24.176                                |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service    | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                            |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                      | Square Feet:                     | Potential Loss %                             |                                |
|                                           | 1970                                                        | 1                                   | Wood                                       | 5,075.00                         | 50%                                          |                                |
| SFHA                                      | Building value:                                             | \$124,316                           |                                            | Contents value:                  | \$248,632                                    |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                     | <b>Value of loss</b>             | <b>NOTES</b>                                 |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                      | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 0.00%                                      | 0                                |                                              |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                     | 130,532                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                     | 149,179                          |                                              |                                |
| Flooding                                  | 50%                                                         | 30%                                 | 40.00%                                     | 149,179                          |                                              |                                |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                     | 167,827                          |                                              |                                |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                     | 149,179                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                     | 130,532                          |                                              |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                     | 298,358                          |                                              |                                |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                     | 149,179                          |                                              |                                |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                     | 186,474                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                            |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Shan's Kwik Corner- Lexington |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 530 East Broadway                   |                                              | COUNTY:                          | Cleveland                                    |                                |
|                                           | Latitude:                                                   | 35°0'52.812                         | Longitude:                                   |                                  | 97°19'41.1708                                |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service      | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                              |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                        | Square Feet:                     | Potential Loss %                             |                                |
|                                           | 1975                                                        | 1                                   | Block                                        | 14,000.00                        | 35%                                          |                                |
| SFHA                                      | Building value:                                             | \$182,757                           |                                              | Contents value:                  | \$365,514                                    |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                       | <b>Value of loss</b>             | <b>NOTES</b>                                 |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                        | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                       | 164,481                          |                                              |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                       | 191,895                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                       | 219,308                          |                                              |                                |
| Flooding                                  | 50%                                                         | 30%                                 | 40.00%                                       | 219,308                          |                                              |                                |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                       | 246,722                          |                                              |                                |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                       | 219,308                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                       | 191,895                          |                                              |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                       | 438,617                          |                                              |                                |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                       | 219,308                          |                                              |                                |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                       | 274,136                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                              |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                  |                                                             | FACILITY NAME: Williams Pharmacy    |                                                    |                                  |                                   |                                |
|-------------------------------------------|----------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                  | 700 East Broadway, Lexington                                |                                     | COUNTY: Cleveland                                  |                                  |                                   |                                |
|                                           |                                  | Latitude:                                                   | 35° 0' 52.038                       | Longitude:                                         | 97° 19' 35.18                    |                                   |                                |
| WHY CRITICAL:                             |                                  | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      |                                  | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                                   |                                |
| Location:                                 |                                  | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Potential Loss %                  |                                |
|                                           |                                  | 1993                                                        | 1                                   | Brick/Wood                                         | 2,736.00                         | 20%                               |                                |
| SFHA                                      |                                  | Building value:                                             | \$94,329                            | Contents value:                                    | \$188,658                        |                                   |                                |
|                                           | <b>Probability of this risk?</b> | <b>Degree of Impact</b>                                     | <b>Percent of loss</b>              | <b>Value of loss</b>                               | <b>NOTES</b>                     |                                   |                                |
| <b>Dam Failure</b>                        | 0%                               | 0%                                                          | 0.00%                               | 0                                                  |                                  |                                   |                                |
| <b>Drought</b>                            | 50%                              | 10%                                                         | 30.00%                              | 84,896                                             |                                  |                                   |                                |
| <b>Earthquake</b>                         | 50%                              | 40%                                                         | 45.00%                              | 127,344                                            |                                  |                                   |                                |
| <b>Extreme heat</b>                       | 70%                              | 10%                                                         | 40.00%                              | 113,195                                            |                                  |                                   |                                |
| <b>Flooding</b>                           | 50%                              | 40%                                                         | 45.00%                              | 127,344                                            |                                  |                                   |                                |
| <b>Hail</b>                               | 70%                              | 20%                                                         | 45.00%                              | 127,344                                            |                                  |                                   |                                |
| <b>High winds</b>                         | 50%                              | 30%                                                         | 40.00%                              | 113,195                                            |                                  |                                   |                                |
| <b>Lightning</b>                          | 50%                              | 20%                                                         | 35.00%                              | 99,045                                             |                                  |                                   |                                |
| <b>Tornado</b>                            | 70%                              | 90%                                                         | 80.00%                              | 226,390                                            |                                  |                                   |                                |
| <b>Wildfires</b>                          | 20%                              | 60%                                                         | 40.00%                              | 113,195                                            |                                  |                                   |                                |
| <b>Winter storms</b>                      | 60%                              | 40%                                                         | 50.00%                              | 141,494                                            |                                  |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                  |                                                             |                                     |                                                    |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Little Axe Community Center |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|--------------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 1000 168th Ave NE, Norman           |                                            | COUNTY: Cleveland                |                                              |                                |
|                                           | Latitude:                                                   | 35° 13'41.9556                      | Longitude:                                 | 97° 11' 39.9703                  |                                              |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service    | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                            |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                      | Square Feet:                     | Vulnerability quotient                       |                                |
|                                           | >1990                                                       | 1                                   | Brick                                      | 4,000.00                         | 20%                                          |                                |
| SFHA                                      | Building value:                                             | \$421,000                           |                                            | Contents value:                  | \$395,000                                    |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                     | <b>Value of loss</b>             | <b>NOTES</b>                                 |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                      | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                     | 244,800                          |                                              |                                |
| Earthquake                                | 50%                                                         | 40%                                 | 45.00%                                     | 367,200                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                     | 326,400                          |                                              |                                |
| Flooding                                  | 50%                                                         | 40%                                 | 45.00%                                     | 367,200                          |                                              |                                |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                     | 367,200                          |                                              |                                |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                     | 326,400                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                     | 285,600                          |                                              |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                     | 652,800                          |                                              |                                |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                     | 326,400                          |                                              |                                |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                     | 408,000                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                            |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Little Axe Country Boy Markets |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 18450 East Hiway 9, Norman          |                                               | COUNTY: Cleveland                |                                              |                                |
|                                           | Latitude:                                                   | 35° 13'55.407                       |                                               | Longitude:                       | 97° 10'13.4926                               |                                |
| WHY CRITICAL:                             | Emergency Service                                           | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service       | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                               |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                         | Square Feet:                     | Potential Loss %                             |                                |
|                                           | 2010                                                        | 1                                   | Metal                                         | 6,200.00                         | 15%                                          |                                |
| SFHA                                      | Building value:                                             | \$861,482                           |                                               | Contents value:                  | \$465,390                                    |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                        | <b>Value of loss</b>             | <b>NOTES</b>                                 |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                         | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                        | 398,062                          |                                              |                                |
| Earthquake                                | 50%                                                         | 40%                                 | 45.00%                                        | 597,092                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                        | 530,749                          |                                              |                                |
| Flooding                                  | 50%                                                         | 40%                                 | 45.00%                                        | 597,092                          |                                              |                                |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                        | 597,092                          |                                              |                                |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                        | 530,749                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                        | 464,405                          |                                              |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                        | 1,061,498                        |                                              |                                |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                        | 530,749                          |                                              |                                |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                        | 663,436                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                               |                                  |                                              |                                |



| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                        | FACILITY NAME: Pecan Valley Grocery     |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|----------------------------------------|-----------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 178055 S Harrah Road, Newalla<br>74857 |                                         | COUNTY: Cleveland                |                                              |                                |
| Latitude:                                 |                                                             | 35° 17' 33.3132                        |                                         | Longitude: 97° 9' 34.2196        |                                              |                                |
| WHY CRITICAL:                             | Emergency Service                                           | <input type="checkbox"/> Government    | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                        |                                         |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                               | Type of Construction:                   | Square Feet:                     | Vulnerability quotient                       |                                |
|                                           | 1985                                                        | 1                                      | Metal w/ aluminum awning                | 3,828.00                         | 25%                                          |                                |
| SFHA                                      | Building value:                                             | \$407,153                              |                                         | Contents value:                  | \$300,000                                    |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>                | <b>Percent of loss</b>                  | <b>Value of loss</b>             | <b>NOTES</b>                                 |                                |
| Dam Failure                               | 0%                                                          | 0%                                     | 0.00%                                   | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 0%                                     | 25.00%                                  | 176,788                          |                                              |                                |
| Earthquake                                | 50%                                                         | 40%                                    | 45.00%                                  | 318,219                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                    | 40.00%                                  | 282,861                          |                                              |                                |
| Flooding                                  | 50%                                                         | 0%                                     | 25.00%                                  | 176,788                          |                                              |                                |
| Hail                                      | 70%                                                         | 40%                                    | 55.00%                                  | 388,934                          |                                              |                                |
| High winds                                | 50%                                                         | 30%                                    | 40.00%                                  | 282,861                          |                                              |                                |
| Lightning                                 | 50%                                                         | 30%                                    | 40.00%                                  | 282,861                          |                                              |                                |
| Tornado                                   | 70%                                                         | 80%                                    | 75.00%                                  | 530,365                          |                                              |                                |
| Wildfires                                 | 20%                                                         | 60%                                    | 40.00%                                  | 282,861                          |                                              |                                |
| Winter storms                             | 60%                                                         | 20%                                    | 40.00%                                  | 282,861                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                        |                                         |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Stella Grocery / Food Mart |                                  |                                              |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-------------------------------------------|----------------------------------|----------------------------------------------|
| FACILITY LOCATION:                        |                                                             | 18001 E 149th, Newalla 74857        |                                           | COUNTY: Cleveland                |                                              |
|                                           | Latitude:                                                   | 35° 19' 9.732                       |                                           | Longitude:                       | 97° 12' 41.1732                              |
| WHY CRITICAL:                             | Emergency Service                                           | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service   | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                           |                                  |                                              |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                     | Square Feet:                     | Vulnerability Quotient                       |
|                                           | 1991                                                        | 1                                   | Block                                     | 4,000.00                         | 35%                                          |
| SFHA                                      | Building value:                                             | \$61,988                            |                                           | Contents value:                  | \$147,000                                    |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                    | <b>Value of loss</b>             | <b>NOTES</b>                                 |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                     | 0                                |                                              |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                    | 62,696                           |                                              |
| Earthquake                                | 50%                                                         | 40%                                 | 45.00%                                    | 94,045                           |                                              |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                    | 83,595                           |                                              |
| Flooding                                  | 50%                                                         | 40%                                 | 45.00%                                    | 94,045                           |                                              |
| Hail                                      | 70%                                                         | 20%                                 | 45.00%                                    | 94,045                           |                                              |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                    | 83,595                           |                                              |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                    | 73,146                           |                                              |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                    | 167,190                          |                                              |
| Wildfires                                 | 20%                                                         | 60%                                 | 40.00%                                    | 83,595                           |                                              |
| Winter storms                             | 60%                                                         | 40%                                 | 50.00%                                    | 104,494                          |                                              |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                           |                                  |                                              |

**CRITICAL FACILITY IDENTIFICATION**

**FACILITY NAME:** Fire Station #2

**FACILITY LOCATION:** 725 NW 12th, Moore

**COUNTY:** Cleveland

Latitude: 35\*20'N

Longitude: 97\*30'W

**WHY CRITICAL:**  **Emergency Service**  **Government**  **Health Service**  **Utility**  **Resource**  **Other**

**ABOUT THE STRUCTURE:** Vulnerability due to location, age and type of construction

Location: **Metropolitan** Year built: 1970 Stories: 2 Type of Construction: Brick Square Feet: 3,900.00 Potential Loss %: 10%

SFHA No \_\_\_\_\_ Building value: \$230,000 Contents value: \$400,000

|                      | Probability of this risk? | Degree of Impact | Percent of loss | Value of loss | NOTES                        |
|----------------------|---------------------------|------------------|-----------------|---------------|------------------------------|
| <b>Dam Failure</b>   | 0%                        | 0%               | 0.00%           | 0             |                              |
| <b>Drought</b>       | 50%                       | 10%              | 0.00%           | 0             | Little impact on structure   |
| <b>Earthquake</b>    | 50%                       | 40%              | 45.00%          | 283,500       |                              |
| <b>Extreme heat</b>  | 90%                       | 30%              | 60.00%          | 378,000       | Damage primarily to contents |
| <b>Flooding</b>      | 30%                       | 20%              | 25.00%          | 157,500       |                              |
| <b>Hail</b>          | 70%                       | 40%              | 55.00%          | 346,500       |                              |
| <b>High winds</b>    | 60%                       | 30%              | 45.00%          | 283,500       |                              |
| <b>Lightning</b>     | 70%                       | 60%              | 65.00%          | 409,500       |                              |
| <b>Tornado</b>       | 70%                       | 100%             | 85.00%          | 535,500       |                              |
| <b>Wildfires</b>     | 0%                        | 0%               | 0.00%           | 0             | Metropolitan location        |
| <b>Winter storms</b> | 70%                       | 30%              | 50.00%          | 315,000       |                              |

*Hazard Mitigation Specialists, LLC*

**Submitted by:** \_\_\_\_\_

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME:                                     |                                  | 7-11 Food Store                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 911 N. Main, Noble                  |                                                    | COUNTY:                          | Cleveland                         |                                |
|                                           | Latitude:                                                   | 35°08'48.5 N                        |                                                    | Longitude:                       | 97°23'40.6234 W                   |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 1980                                                        | 1                                   | Metal / steel span                                 | 2,400                            | 10%                               |                                |
| SFHA _____                                | Building value:                                             | \$81,738                            |                                                    | Contents value:                  | \$248,460                         |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>             | <b>Percent of loss</b>                             | <b>Value of loss</b>             | <b>NOTES</b>                      |                                |
| <b>Dam Failure</b>                        | 0%                                                          | 0%                                  | 0.00%                                              | 0                                |                                   |                                |
| <b>Drought</b>                            | 50%                                                         | 10%                                 | 30.00%                                             | 99,059                           |                                   |                                |
| <b>Earthquake</b>                         | 50%                                                         | 50%                                 | 50.00%                                             | 165,099                          |                                   |                                |
| <b>Extreme heat</b>                       | 70%                                                         | 10%                                 | 40.00%                                             | 132,079                          |                                   |                                |
| <b>Flooding</b>                           | 40%                                                         | 50%                                 | 45.00%                                             | 148,589                          |                                   |                                |
| <b>Hail</b>                               | 70%                                                         | 30%                                 | 50.00%                                             | 165,099                          |                                   |                                |
| <b>High winds</b>                         | 50%                                                         | 40%                                 | 45.00%                                             | 148,589                          |                                   |                                |
| <b>Lightning</b>                          | 50%                                                         | 20%                                 | 35.00%                                             | 115,569                          |                                   |                                |
| <b>Tornado</b>                            | 70%                                                         | 90%                                 | 80.00%                                             | 264,158                          |                                   |                                |
| <b>Wildfires</b>                          | 40%                                                         | 50%                                 | 45.00%                                             | 148,589                          |                                   |                                |
| <b>Winter storms</b>                      | 50%                                                         | 60%                                 | 55.00%                                             | 181,609                          |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                    |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Cedar Country Volunteer Fire Dept |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|--------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 10191 180th Street, Noble           |                                                  | COUNTY: Cleveland                |                                   |                                |
|                                           | Latitude:                                                   | 35*08'20.43N                        |                                                  | Longitude:                       | 97*21'11.68 W                     |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service          | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                  |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                            | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 2007                                                        | 1                                   | Metal                                            | 3,600                            | 20%                               |                                |
| SFHA _____                                | Building value:                                             | \$57,000                            |                                                  | Contents value:                  | \$210,000                         |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                  | Value of loss                    | NOTES                             |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                            | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                           | 80,100                           |                                   |                                |
| Earthquake                                | 50%                                                         | 50%                                 | 50.00%                                           | 133,500                          |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                           | 106,800                          |                                   |                                |
| Flooding                                  | 40%                                                         | 50%                                 | 45.00%                                           | 120,150                          |                                   |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                           | 133,500                          |                                   |                                |
| High winds                                | 50%                                                         | 40%                                 | 45.00%                                           | 120,150                          |                                   |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                           | 93,450                           |                                   |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                           | 213,600                          |                                   |                                |
| Wildfires                                 | 40%                                                         | 50%                                 | 45.00%                                           | 120,150                          |                                   |                                |
| Winter storms                             | 50%                                                         | 60%                                 | 55.00%                                           | 146,850                          |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                  |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Church of Jesus Christ of Latter Saints |                                  |                                                                             |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|--------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|
| FACILITY LOCATION:                        |                                                             | 4401 Maguire Road, Noble            |                                                        | COUNTY:                          | Cleveland                                                                   |
|                                           | Latitude:                                                   | 35' 7' 55.4016                      |                                                        | Longitude:                       | 97; 22' 38.0604                                                             |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service                | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource <input checked="" type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                        |                                  |                                                                             |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                                  | Square Feet:                     | Vulnerability quotient                                                      |
|                                           | 1980                                                        | 1                                   | Brick / metal frame                                    | 25,072                           | 35%                                                                         |
| SFHA _____                                | Building value:                                             | \$2,307,323                         |                                                        | Contents value:                  | \$4,614,646                                                                 |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                        | Value of loss                    | NOTES                                                                       |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                                  | 0                                |                                                                             |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                                 | 2,076,591                        |                                                                             |
| Earthquake                                | 50%                                                         | 30%                                 | 40.00%                                                 | 2,768,788                        |                                                                             |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                                 | 2,768,788                        |                                                                             |
| Flooding                                  | 40%                                                         | 50%                                 | 45.00%                                                 | 3,114,886                        |                                                                             |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                                 | 3,460,985                        |                                                                             |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                                 | 2,768,788                        |                                                                             |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                                 | 2,422,689                        |                                                                             |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                                 | 5,537,575                        |                                                                             |
| Wildfires                                 | 40%                                                         | 40%                                 | 40.00%                                                 | 2,768,788                        |                                                                             |
| Winter storms                             | 50%                                                         | 20%                                 | 35.00%                                                 | 2,422,689                        |                                                                             |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                        |                                  |                                                                             |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                                | FACILITY NAME:                          |                                  | Noble City Hall                   |                                |
|-------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-----------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 304 S. Main, Noble                             |                                         | COUNTY:                          | Cleveland                         |                                |
|                                           | Latitude:                                                   | 35*08'56.49 N                                  |                                         | Longitude:                       | 97*24'38.70 W                     |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input checked="" type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                                |                                         |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                                       | Type of Construction:                   | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 1980                                                        | 1                                              | Brick                                   | 2,934                            | 35%                               |                                |
| SFHA <u>NO</u>                            | Building value:                                             | \$140,316                                      |                                         | Contents value:                  | \$378,624                         |                                |
|                                           | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b>                        | <b>Percent of loss</b>                  | <b>Value of loss</b>             | <b>NOTES</b>                      |                                |
| <b>Dam Failure</b>                        | 0%                                                          | 0%                                             | 0.00%                                   | 0                                |                                   |                                |
| <b>Drought</b>                            | 50%                                                         | 10%                                            | 30.00%                                  | 155,682                          |                                   |                                |
| <b>Earthquake</b>                         | 50%                                                         | 50%                                            | 50.00%                                  | 259,470                          |                                   |                                |
| <b>Extreme heat</b>                       | 70%                                                         | 40%                                            | 55.00%                                  | 285,417                          |                                   |                                |
| <b>Flooding</b>                           | 40%                                                         | 50%                                            | 45.00%                                  | 233,523                          |                                   |                                |
| <b>Hail</b>                               | 70%                                                         | 30%                                            | 50.00%                                  | 259,470                          |                                   |                                |
| <b>High winds</b>                         | 50%                                                         | 20%                                            | 35.00%                                  | 181,629                          |                                   |                                |
| <b>Lightning</b>                          | 50%                                                         | 40%                                            | 45.00%                                  | 233,523                          |                                   |                                |
| <b>Tornado</b>                            | 70%                                                         | 90%                                            | 80.00%                                  | 415,152                          |                                   |                                |
| <b>Wildfires</b>                          | 40%                                                         | 40%                                            | 40.00%                                  | 207,576                          |                                   |                                |
| <b>Winter storms</b>                      | 50%                                                         | 50%                                            | 50.00%                                  | 259,470                          |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                                |                                         |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                           |                                                             | FACILITY NAME: Covenant Church of Noble |                                                    |                                     |
|-------------------------------------------|---------------------------|-------------------------------------------------------------|-----------------------------------------|----------------------------------------------------|-------------------------------------|
| FACILITY LOCATION:                        |                           | 600 East Etowah, Noble 73068                                |                                         | COUNTY: Cleveland                                  |                                     |
|                                           |                           | Latitude:                                                   | 35*8'43.040 N                           | Longitude:                                         | 97*22'19.3508 W                     |
| WHY CRITICAL:                             |                           | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government     | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility    |
|                                           |                           |                                                             |                                         | <input type="checkbox"/> Resource                  | <input type="checkbox"/> Other      |
| ABOUT THE STRUCTURE:                      |                           | Vulnerability due to location, age and type of construction |                                         |                                                    |                                     |
| Location:                                 |                           | Year built:                                                 | Stories:                                | Type of Construction:                              | Square Feet: Vulnerability quotient |
|                                           |                           | 2006                                                        | 1                                       | Brick                                              | 1,600 10%                           |
| SFHA _____                                |                           | Building value:                                             | \$270,250                               | Contents value:                                    | \$260,000                           |
|                                           | Probability of this risk? | Degree of Impact                                            | Percent of loss                         | Value of loss                                      | NOTES                               |
| Dam Failure                               | 0%                        | 0%                                                          | 0.00%                                   | 0                                                  |                                     |
| Drought                                   | 50%                       | 10%                                                         | 30.00%                                  | 159,075                                            |                                     |
| Earthquake                                | 50%                       | 20%                                                         | 35.00%                                  | 185,588                                            |                                     |
| Extreme heat                              | 70%                       | 10%                                                         | 40.00%                                  | 212,100                                            |                                     |
| Flooding                                  | 40%                       | 40%                                                         | 40.00%                                  | 212,100                                            |                                     |
| Hail                                      | 70%                       | 30%                                                         | 50.00%                                  | 265,125                                            |                                     |
| High winds                                | 50%                       | 20%                                                         | 35.00%                                  | 185,588                                            |                                     |
| Lightning                                 | 50%                       | 20%                                                         | 35.00%                                  | 185,588                                            |                                     |
| Tornado                                   | 70%                       | 70%                                                         | 70.00%                                  | 371,175                                            |                                     |
| Wildfires                                 | 40%                       | 30%                                                         | 35.00%                                  | 185,588                                            |                                     |
| Winter storms                             | 50%                       | 20%                                                         | 35.00%                                  | 185,588                                            |                                     |
| <i>Hazard Mitigation Specialists, LLC</i> |                           |                                                             |                                         |                                                    |                                     |



| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Dental Lodge / Gabe Nabors DDS      |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 3035 A North Main, Noble            |                                                    | COUNTY:                          | Cleveland                         |                                |
|                                           | Latitude:                                                   | 35*08'32.5288 N                     | Longitude:                                         |                                  | 97*23'40.6234 W                   |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 2010                                                        | 1                                   | Brick / metal frame                                | 4,800                            | 10%                               |                                |
| SFHA _____                                | Building value:                                             | \$664,439                           |                                                    | Contents value:                  | \$1,328,878                       |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                    | Value of loss                    | NOTES                             |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                              | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                             | 597,995                          |                                   |                                |
| Earthquake                                | 50%                                                         | 50%                                 | 50.00%                                             | 996,659                          |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                             | 797,327                          |                                   |                                |
| Flooding                                  | 40%                                                         | 50%                                 | 45.00%                                             | 896,993                          |                                   |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                             | 996,659                          |                                   |                                |
| High winds                                | 50%                                                         | 40%                                 | 45.00%                                             | 896,993                          |                                   |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                             | 697,661                          |                                   |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                             | 1,594,654                        |                                   |                                |
| Wildfires                                 | 40%                                                         | 50%                                 | 45.00%                                             | 896,993                          |                                   |                                |
| Winter storms                             | 50%                                                         | 60%                                 | 55.00%                                             | 1,096,324                        |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                    |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Noble Fire Department    |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 115 North 2nd, Noble                |                                         | COUNTY: Cleveland                |                                   |                                |
|                                           | Latitude:                                                   | 35*08'26 N                          |                                         | Longitude:                       | 97*23'45 W                        |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 2007                                                        | 1                                   | Brick / metal frame                     | 4,000                            | 10%                               |                                |
| SFHA _____                                | Building value:                                             | \$138,000                           |                                         | Contents value:                  | \$427,000                         |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                         | Value of loss                    | NOTES                             |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                  | 169,500                          |                                   |                                |
| Earthquake                                | 50%                                                         | 50%                                 | 50.00%                                  | 282,500                          |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                  | 226,000                          |                                   |                                |
| Flooding                                  | 40%                                                         | 50%                                 | 45.00%                                  | 254,250                          |                                   |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                  | 282,500                          |                                   |                                |
| High winds                                | 50%                                                         | 40%                                 | 45.00%                                  | 254,250                          |                                   |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                  | 197,750                          |                                   |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                  | 452,000                          |                                   |                                |
| Wildfires                                 | 40%                                                         | 50%                                 | 45.00%                                  | 254,250                          |                                   |                                |
| Winter storms                             | 50%                                                         | 60%                                 | 55.00%                                  | 310,750                          |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                         |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Noble Hardware           |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 605 N Main, Noble                   |                                         | COUNTY: Cleveland                |                                              |                                |
|                                           | Latitude:                                                   | 35*13'49.60 N                       |                                         | Longitude:                       | 97*23'39.86 W                                |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Vulnerability quotient                       |                                |
|                                           | 1980                                                        | 1                                   | Metal frame                             | 8,019                            | 40%                                          |                                |
| SFHA _____                                | Building value:                                             | \$184,351                           |                                         | Contents value:                  | \$368,702                                    |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                         | Value of loss                    | NOTES                                        |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                  | 165,916                          |                                              |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                  | 193,569                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                  | 221,221                          |                                              |                                |
| Flooding                                  | 40%                                                         | 30%                                 | 35.00%                                  | 193,569                          |                                              |                                |
| Hail                                      | 70%                                                         | 10%                                 | 40.00%                                  | 221,221                          |                                              |                                |
| High winds                                | 50%                                                         | 20%                                 | 35.00%                                  | 193,569                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                  | 193,569                          |                                              |                                |
| Tornado                                   | 70%                                                         | 50%                                 | 60.00%                                  | 331,832                          |                                              |                                |
| Wildfires                                 | 40%                                                         | 50%                                 | 45.00%                                  | 248,874                          |                                              |                                |
| Winter storms                             | 50%                                                         | 30%                                 | 40.00%                                  | 221,221                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                         |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Noble Healthcare LLC / Nursing Home |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 1501 North 8th, Noble               |                                                    | COUNTY:                          | Cleveland                         |                                |
|                                           | Latitude:                                                   | 35*9'32.701 N                       | Longitude:                                         |                                  | 97*23'18.137" W                   |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 1993                                                        | 1                                   | Brick / Metal Frame                                | 42,756                           | 20%                               |                                |
| SFHA _____                                | Building value:                                             | \$3,075,210                         |                                                    | Contents value:                  | \$6,150,420                       |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                    | Value of loss                    | NOTES                             |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                              | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                             | 2,767,689                        |                                   |                                |
| Earthquake                                | 50%                                                         | 30%                                 | 40.00%                                             | 3,690,252                        |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                             | 3,690,252                        |                                   |                                |
| Flooding                                  | 40%                                                         | 50%                                 | 45.00%                                             | 4,151,534                        |                                   |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                             | 4,612,815                        |                                   |                                |
| High winds                                | 50%                                                         | 20%                                 | 35.00%                                             | 3,228,971                        |                                   |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                             | 3,228,971                        |                                   |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                             | 7,380,504                        |                                   |                                |
| Wildfires                                 | 40%                                                         | 30%                                 | 35.00%                                             | 3,228,971                        |                                   |                                |
| Winter storms                             | 50%                                                         | 60%                                 | 55.00%                                             | 5,074,097                        |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                    |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Noble Medical Center / Dental       |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 408 N Main, Noble                   |                                                    | COUNTY: Cleveland                |                                   |                                |
|                                           | Latitude:                                                   | 35°8'39.019 N                       |                                                    | Longitude:                       | 97°23'42.007 W                    |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 1986                                                        | 1                                   | Brick / Wood frame                                 | 2,294                            | 20%                               |                                |
| SFHA _____                                | Building value:                                             | \$100,826                           |                                                    | Contents value:                  | \$201,652                         |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                    | Value of loss                    | NOTES                             |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                              | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                             | 90,743                           |                                   |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                             | 105,867                          |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                             | 120,991                          |                                   |                                |
| Flooding                                  | 40%                                                         | 40%                                 | 40.00%                                             | 120,991                          |                                   |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                             | 151,239                          |                                   |                                |
| High winds                                | 50%                                                         | 20%                                 | 35.00%                                             | 105,867                          |                                   |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                             | 105,867                          |                                   |                                |
| Tornado                                   | 70%                                                         | 50%                                 | 60.00%                                             | 181,487                          |                                   |                                |
| Wildfires                                 | 40%                                                         | 30%                                 | 35.00%                                             | 105,867                          |                                   |                                |
| Winter storms                             | 50%                                                         | 40%                                 | 45.00%                                             | 136,115                          |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                    |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Nathan's Auto Repair     |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 628 North Main, Noble               |                                         | COUNTY:                          | Cleveland                                    |                                |
|                                           | Latitude:                                                   | 35*08.52.86 N                       |                                         | Longitude:                       | 97*23'46.29 W                                |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Vulnerability quotient                       |                                |
|                                           | 1980                                                        | 1                                   | Metal                                   | 3,600                            | 40%                                          |                                |
| SFHA _____                                | Building value:                                             | \$102,502                           |                                         | Contents value:                  | \$205,004                                    |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                         | Value of loss                    | NOTES                                        |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                  | 92,252                           |                                              |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                  | 107,627                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                  | 123,002                          |                                              |                                |
| Flooding                                  | 40%                                                         | 40%                                 | 40.00%                                  | 123,002                          |                                              |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                  | 153,753                          |                                              |                                |
| High winds                                | 50%                                                         | 20%                                 | 35.00%                                  | 107,627                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                  | 107,627                          |                                              |                                |
| Tornado                                   | 70%                                                         | 70%                                 | 70.00%                                  | 215,254                          |                                              |                                |
| Wildfires                                 | 40%                                                         | 30%                                 | 35.00%                                  | 107,627                          |                                              |                                |
| Winter storms                             | 50%                                                         | 20%                                 | 35.00%                                  | 107,627                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                         |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: O'Reilly Auto Parts      |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 627 N. Main, Noble                  |                                         | COUNTY: Cleveland                |                                              |                                |
|                                           | Latitude:                                                   | 35*08'52.88N                        |                                         | Longitude:                       | 97*23'46.33 W                                |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Vulnerability quotient                       |                                |
|                                           | 2009                                                        | 1                                   | Brick / Metal Frame                     | 6,857                            | 10%                                          |                                |
| SFHA _____                                | Building value:                                             | \$394,844                           |                                         | Contents value:                  | \$589,688                                    |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                         | Value of loss                    | NOTES                                        |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                  | 295,360                          |                                              |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                  | 344,586                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                  | 393,813                          |                                              |                                |
| Flooding                                  | 40%                                                         | 40%                                 | 40.00%                                  | 393,813                          |                                              |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                  | 492,266                          |                                              |                                |
| High winds                                | 50%                                                         | 20%                                 | 35.00%                                  | 344,586                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                  | 344,586                          |                                              |                                |
| Tornado                                   | 70%                                                         | 50%                                 | 60.00%                                  | 590,719                          |                                              |                                |
| Wildfires                                 | 40%                                                         | 30%                                 | 35.00%                                  | 344,586                          |                                              |                                |
| Winter storms                             | 50%                                                         | 40%                                 | 45.00%                                  | 443,039                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                         |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Noble Pharmacy                      |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 125 South Main, Noble               |                                                    | COUNTY: Cleveland                |                                   |                                |
|                                           | Latitude:                                                   | 35*8.200.279 N                      |                                                    | Longitude:                       | 97*23'40.768 W                    |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 1984                                                        | 1                                   | Brick / metal frame                                | 3,240                            | 35%                               |                                |
| SFHA _____                                | Building value:                                             | \$391,723                           |                                                    | Contents value:                  | \$783,545                         |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                    | Value of loss                    | NOTES                             |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                              | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                             | 352,580                          |                                   |                                |
| Earthquake                                | 50%                                                         | 30%                                 | 40.00%                                             | 470,107                          |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                             | 470,107                          |                                   |                                |
| Flooding                                  | 40%                                                         | 70%                                 | 55.00%                                             | 646,397                          |                                   |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                             | 587,634                          |                                   |                                |
| High winds                                | 50%                                                         | 30%                                 | 40.00%                                             | 470,107                          |                                   |                                |
| Lightning                                 | 50%                                                         | 30%                                 | 40.00%                                             | 470,107                          |                                   |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                             | 940,214                          |                                   |                                |
| Wildfires                                 | 40%                                                         | 30%                                 | 35.00%                                             | 411,344                          |                                   |                                |
| Winter storms                             | 50%                                                         | 20%                                 | 35.00%                                             | 411,344                          |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                    |                                  |                                   |                                |



| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Noble Police Station     |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 117 North 2nd, Noble                |                                         | COUNTY:                          | Cleveland                         |                                |
|                                           | Latitude:                                                   | 35*08'25 N                          |                                         | Longitude:                       | 97*23'45.12 W                     |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 2007                                                        | 1                                   | Precast Walls / Metal Frame             | 4,000                            | 10%                               |                                |
| SFHA _____                                | Building value:                                             | \$482,000                           |                                         | Contents value:                  | \$405,000                         |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                         | Value of loss                    | NOTES                             |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                  | 266,100                          |                                   |                                |
| Earthquake                                | 50%                                                         | 50%                                 | 50.00%                                  | 443,500                          |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                  | 354,800                          |                                   |                                |
| Flooding                                  | 40%                                                         | 50%                                 | 45.00%                                  | 399,150                          |                                   |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                  | 443,500                          |                                   |                                |
| High winds                                | 50%                                                         | 40%                                 | 45.00%                                  | 399,150                          |                                   |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                  | 310,450                          |                                   |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                  | 709,600                          |                                   |                                |
| Wildfires                                 | 40%                                                         | 50%                                 | 45.00%                                  | 399,150                          |                                   |                                |
| Winter storms                             | 50%                                                         | 60%                                 | 55.00%                                  | 487,850                          |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                         |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Noble Post Office                   |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 220 East Maple, Noble               |                                                    | COUNTY: Cleveland                |                                   |                                |
|                                           | Latitude:                                                   | 35*13'60.83 N                       |                                                    | Longitude:                       | 97*39'50.84 W                     |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 2001                                                        | 1                                   | Brick / metal                                      | 2,400                            | 10%                               |                                |
| SFHA _____                                | Building value:                                             | \$67,000                            |                                                    | Contents value:                  | \$28,000                          |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                    | Value of loss                    | NOTES                             |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                              | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                             | 28,500                           |                                   |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                             | 33,250                           |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                             | 38,000                           |                                   |                                |
| Flooding                                  | 40%                                                         | 30%                                 | 35.00%                                             | 33,250                           |                                   |                                |
| Hail                                      | 70%                                                         | 10%                                 | 40.00%                                             | 38,000                           |                                   |                                |
| High winds                                | 50%                                                         | 20%                                 | 35.00%                                             | 33,250                           |                                   |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                             | 33,250                           |                                   |                                |
| Tornado                                   | 70%                                                         | 50%                                 | 60.00%                                             | 57,000                           |                                   |                                |
| Wildfires                                 | 40%                                                         | 50%                                 | 45.00%                                             | 42,750                           |                                   |                                |
| Winter storms                             | 50%                                                         | 30%                                 | 40.00%                                             | 38,000                           |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                    |                                  |                                   |                                |

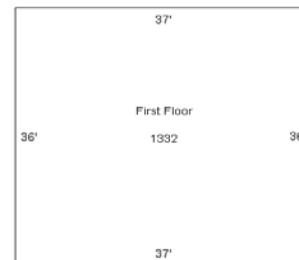
| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Terry's Market           |                                  |                                              |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 620 South 6th Street, Noble         |                                         | COUNTY: Cleveland                |                                              |                                |
|                                           | Latitude:                                                   | 35*07'54.26 N                       |                                         | Longitude:                       | 97*23'27.99 W                                |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                         |                                  |                                              |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                   | Square Feet:                     | Vulnerability quotient                       |                                |
|                                           | 2001                                                        | 1                                   | Metal                                   | 2,400                            | 15%                                          |                                |
| SFHA _____                                | Building value:                                             | \$275,684                           |                                         | Contents value:                  | \$551,368                                    |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                         | Value of loss                    | NOTES                                        |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                   | 0                                |                                              |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                  | 248,116                          |                                              |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                  | 289,468                          |                                              |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                  | 330,821                          |                                              |                                |
| Flooding                                  | 40%                                                         | 40%                                 | 40.00%                                  | 330,821                          |                                              |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                  | 413,526                          |                                              |                                |
| High winds                                | 50%                                                         | 20%                                 | 35.00%                                  | 289,468                          |                                              |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                  | 289,468                          |                                              |                                |
| Tornado                                   | 70%                                                         | 70%                                 | 70.00%                                  | 578,936                          |                                              |                                |
| Wildfires                                 | 40%                                                         | 30%                                 | 35.00%                                  | 289,468                          |                                              |                                |
| Winter storms                             | 50%                                                         | 20%                                 | 35.00%                                  | 289,468                          |                                              |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                         |                                  |                                              |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Noble Utility Authority             |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 304 S. Main, Noble                  |                                                    | COUNTY: Cleveland                |                                   |                                |
|                                           | Latitude:                                                   | 35*08'56.49 N                       |                                                    | Longitude:                       | 97*24'38.70 W                     |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Vulnerability quotient            |                                |
|                                           | 1980                                                        | 1                                   | Brick                                              | 2,934                            | 35%                               |                                |
| SFHA ____ NO ____                         | Building value:                                             | \$205,059                           |                                                    | Contents value:                  | \$410,118                         |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                    | Value of loss                    | NOTES                             |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                              | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                             | 184,553                          |                                   |                                |
| Earthquake                                | 50%                                                         | 50%                                 | 50.00%                                             | 307,589                          |                                   |                                |
| Extreme heat                              | 70%                                                         | 40%                                 | 55.00%                                             | 338,347                          |                                   |                                |
| Flooding                                  | 40%                                                         | 50%                                 | 45.00%                                             | 276,830                          |                                   |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                             | 307,589                          |                                   |                                |
| High winds                                | 50%                                                         | 20%                                 | 35.00%                                             | 215,312                          |                                   |                                |
| Lightning                                 | 50%                                                         | 40%                                 | 45.00%                                             | 276,830                          |                                   |                                |
| Tornado                                   | 70%                                                         | 90%                                 | 80.00%                                             | 492,142                          |                                   |                                |
| Wildfires                                 | 40%                                                         | 40%                                 | 40.00%                                             | 246,071                          |                                   |                                |
| Winter storms                             | 50%                                                         | 50%                                 | 50.00%                                             | 307,589                          |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                    |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION          |                                                             |                                     | FACILITY NAME: Noble Wastewater Treatment          |                                  |                                   |                                |
|-------------------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| FACILITY LOCATION:                        |                                                             | 599 Etowah Rd, Noble                |                                                    | COUNTY: Cleveland                |                                   |                                |
|                                           | Latitude:                                                   | 35*08'56.49 N                       |                                                    | Longitude:                       | 97*24'38.70 W                     |                                |
| WHY CRITICAL:                             | <input type="checkbox"/> Emergency Service                  | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE:                      | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                                   |                                |
| Location:                                 | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Vulnerability quotient            |                                |
| SFHA _____                                | Building value:                                             |                                     |                                                    | Contents value:                  |                                   |                                |
|                                           | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                    | Value of loss                    | NOTES                             |                                |
| Dam Failure                               | 0%                                                          | 0%                                  | 0.00%                                              | 0                                |                                   |                                |
| Drought                                   | 50%                                                         | 10%                                 | 30.00%                                             | 0                                |                                   |                                |
| Earthquake                                | 50%                                                         | 20%                                 | 35.00%                                             | 0                                |                                   |                                |
| Extreme heat                              | 70%                                                         | 10%                                 | 40.00%                                             | 0                                |                                   |                                |
| Flooding                                  | 40%                                                         | 40%                                 | 40.00%                                             | 0                                |                                   |                                |
| Hail                                      | 70%                                                         | 30%                                 | 50.00%                                             | 0                                |                                   |                                |
| High winds                                | 50%                                                         | 20%                                 | 35.00%                                             | 0                                |                                   |                                |
| Lightning                                 | 50%                                                         | 20%                                 | 35.00%                                             | 0                                |                                   |                                |
| Tornado                                   | 70%                                                         | 70%                                 | 70.00%                                             | 0                                |                                   |                                |
| Wildfires                                 | 40%                                                         | 30%                                 | 35.00%                                             | 0                                |                                   |                                |
| Winter storms                             | 50%                                                         | 40%                                 | 45.00%                                             | 0                                |                                   |                                |
| <i>Hazard Mitigation Specialists, LLC</i> |                                                             |                                     |                                                    |                                  |                                   |                                |

| CRITICAL FACILITY IDENTIFICATION |                                                             |                                     |                                                    |                                  |                                   |                                |
|----------------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| <b>FACILITY LOCATION:</b>        |                                                             |                                     | 2000 168th Ave, Newalla                            |                                  |                                   |                                |
| Latitude:                        |                                                             |                                     | 35° 11' 6.3769                                     |                                  |                                   |                                |
| <b>FACILITY NAME:</b>            |                                                             |                                     | Little Axe Schools                                 |                                  |                                   |                                |
| <b>COUNTY:</b>                   |                                                             |                                     | Cleveland                                          |                                  |                                   |                                |
| Longitude:                       |                                                             |                                     | 97° 11' 41.6062                                    |                                  |                                   |                                |
| <b>WHY CRITICAL:</b>             | Emergency Service                                           | <input type="checkbox"/> Government | <input checked="" type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| <b>ABOUT THE STRUCTURE:</b>      | Vulnerability due to location, age and type of construction |                                     |                                                    |                                  |                                   |                                |
| Location:                        | Year built:                                                 | Stories:                            | Type of Construction:                              | Square Feet:                     | Potential Loss %                  |                                |
|                                  | 1955                                                        | 1                                   | Wood frame / gable roof                            | 1,332.00                         | 100%                              |                                |
| SFHA                             | Building value: \$18,639                                    |                                     | Contents value: \$70,386                           |                                  |                                   |                                |
|                                  | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                    | Value of loss                    | NOTES                             |                                |
| Dam Failure                      | 0%                                                          | 0%                                  | 0.00%                                              | 0                                |                                   |                                |
| Drought                          | 50%                                                         | 10%                                 | 30.00%                                             | 26,708                           |                                   |                                |
| Earthquake                       | 50%                                                         | 40%                                 | 45.00%                                             | 40,061                           |                                   |                                |
| Extreme heat                     | 70%                                                         | 10%                                 | 40.00%                                             | 35,610                           |                                   |                                |
| Flooding                         | 50%                                                         | 40%                                 | 45.00%                                             | 40,061                           |                                   |                                |
| Hail                             | 70%                                                         | 20%                                 | 45.00%                                             | 40,061                           |                                   |                                |
| High winds                       | 50%                                                         | 30%                                 | 40.00%                                             | 35,610                           |                                   |                                |
| Lightning                        | 50%                                                         | 20%                                 | 35.00%                                             | 31,159                           |                                   |                                |
| Tornado                          | 70%                                                         | 90%                                 | 80.00%                                             | 71,220                           |                                   |                                |
| Wildfires                        | 20%                                                         | 60%                                 | 40.00%                                             | 35,610                           |                                   |                                |
| Winter storms                    | 60%                                                         | 40%                                 | 50.00%                                             | 44,513                           |                                   |                                |

Hazard Mitigation Specialists, LLC



Sketch by Apex Media™

| CRITICAL FACILITY IDENTIFICATION                                                                                                                                                                                                    |                           |                  |                                                   |               |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------|---------------------------------------------------|---------------|------------------------|
| <b>FACILITY LOCATION:</b> 1000 168th Ave NE, Norman                                                                                                                                                                                 |                           |                  | <b>FACILITY NAME:</b> Little Axe Community Center |               |                        |
| Latitude: 35° 13'41.9556                                                                                                                                                                                                            |                           |                  | <b>COUNTY:</b> Cleveland                          |               |                        |
|                                                                                                                                                                                                                                     |                           |                  | Longitude: 97° 11' 39.9703                        |               |                        |
| <b>WHY CRITICAL:</b>                                                                                                                                                                                                                |                           |                  |                                                   |               |                        |
| <input type="checkbox"/> Emergency Service <input type="checkbox"/> Government <input type="checkbox"/> Health Service <input type="checkbox"/> Utility <input checked="" type="checkbox"/> Resource <input type="checkbox"/> Other |                           |                  |                                                   |               |                        |
| <b>ABOUT THE STRUCTURE:</b> Vulnerability due to location, age and type of construction                                                                                                                                             |                           |                  |                                                   |               |                        |
| Location:                                                                                                                                                                                                                           | Year built:               | Stories:         | Type of Construction:                             | Square Feet:  | Vulnerability quotient |
|                                                                                                                                                                                                                                     | >1990                     | 1                | Brick                                             | 4,000         | 20%                    |
| <b>SFHA</b> Building value: \$421,000 Contents value: \$395,000                                                                                                                                                                     |                           |                  |                                                   |               |                        |
|                                                                                                                                                                                                                                     | Probability of this risk? | Degree of Impact | Percent of loss                                   | Value of loss | NOTES                  |
| Dam Failure                                                                                                                                                                                                                         | 0%                        | 0%               | 0%                                                | 0             |                        |
| Drought                                                                                                                                                                                                                             | 50%                       | 10%              | 30%                                               | 244,800       |                        |
| Earthquake                                                                                                                                                                                                                          | 50%                       | 40%              | 45%                                               | 367,200       |                        |
| Extreme heat                                                                                                                                                                                                                        | 70%                       | 10%              | 40%                                               | 326,400       |                        |
| Flooding                                                                                                                                                                                                                            | 50%                       | 40%              | 45%                                               | 367,200       |                        |
| Hail                                                                                                                                                                                                                                | 70%                       | 20%              | 45%                                               | 367,200       |                        |
| High winds                                                                                                                                                                                                                          | 50%                       | 30%              | 40%                                               | 326,400       |                        |
| Lightning                                                                                                                                                                                                                           | 50%                       | 20%              | 35%                                               | 285,600       |                        |
| Tornado                                                                                                                                                                                                                             | 70%                       | 90%              | 80%                                               | 652,800       |                        |
| Wildfires                                                                                                                                                                                                                           | 20%                       | 60%              | 40%                                               | 326,400       |                        |
| Winter storms                                                                                                                                                                                                                       | 60%                       | 40%              | 50%                                               | 408,000       |                        |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION                                                 |                           | FACILITY NAME: Little Axe Country Boy Markets |                                         |                                  |                                              |                                |
|----------------------------------------------------------------------------------|---------------------------|-----------------------------------------------|-----------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| FACILITY LOCATION: 18450 East Hiway 9, Norman                                    |                           | COUNTY: Cleveland                             |                                         |                                  |                                              |                                |
| Latitude: 35° 13'55.407                                                          |                           | Longitude: 97° 10'13.4926                     |                                         |                                  |                                              |                                |
| WHY CRITICAL:                                                                    | Emergency Service         | <input type="checkbox"/> Government           | <input type="checkbox"/> Health Service | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| ABOUT THE STRUCTURE: Vulnerability due to location, age and type of construction |                           |                                               |                                         |                                  |                                              |                                |
| Location:                                                                        | Year built:               | Stories:                                      | Type of Construction:                   | Square Feet:                     | Potential Loss %                             |                                |
|                                                                                  | 2010                      | 1                                             | Metal                                   | 6,200.00                         | 15%                                          |                                |
| SFHA                                                                             |                           | Building value: \$861,482                     |                                         | Contents value: \$465,390        |                                              |                                |
|                                                                                  | Probability of this risk? | Degree of Impact                              | Percent of loss                         | Value of loss                    | NOTES                                        |                                |
| Dam Failure                                                                      | 0%                        | 0%                                            | 0%                                      | 0                                |                                              |                                |
| Drought                                                                          | 50%                       | 10%                                           | 30%                                     | 398,062                          |                                              |                                |
| Earthquake                                                                       | 50%                       | 40%                                           | 45%                                     | 597,092                          |                                              |                                |
| Extreme heat                                                                     | 70%                       | 10%                                           | 40%                                     | 530,749                          |                                              |                                |
| Flooding                                                                         | 50%                       | 40%                                           | 45%                                     | 597,092                          |                                              |                                |
| Hail                                                                             | 70%                       | 20%                                           | 45%                                     | 597,092                          |                                              |                                |
| High winds                                                                       | 50%                       | 30%                                           | 40%                                     | 530,749                          |                                              |                                |
| Lightning                                                                        | 50%                       | 20%                                           | 35%                                     | 464,405                          |                                              |                                |
| Tornado                                                                          | 70%                       | 90%                                           | 80%                                     | 1,061,498                        |                                              |                                |
| Wildfires                                                                        | 20%                       | 60%                                           | 40%                                     | 530,749                          |                                              |                                |
| Winter storms                                                                    | 60%                       | 40%                                           | 50%                                     | 663,436                          |                                              |                                |

Hazard Mitigation Specialists, LLC

Submitted by: \_\_\_\_\_



| CRITICAL FACILITY IDENTIFICATION                          |                                                                                                                                                                                                                                     | FACILITY NAME:            |                           |               |                        |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------|---------------|------------------------|
| FACILITY LOCATION: 178055 S Harrah Road, Newalla<br>74857 |                                                                                                                                                                                                                                     | COUNTY: Cleveland         |                           |               |                        |
| Latitude: 35° 17' 33.3132                                 |                                                                                                                                                                                                                                     | Longitude: 97° 9' 34.2196 |                           |               |                        |
| WHY CRITICAL:                                             | <input type="checkbox"/> Emergency Service <input type="checkbox"/> Government <input type="checkbox"/> Health Service <input type="checkbox"/> Utility <input checked="" type="checkbox"/> Resource <input type="checkbox"/> Other |                           |                           |               |                        |
| ABOUT THE STRUCTURE:                                      | Vulnerability due to location, age and type of construction                                                                                                                                                                         |                           |                           |               |                        |
| Location:                                                 | Year built:                                                                                                                                                                                                                         | Stories:                  | Type of Construction:     | Square Feet:  | Vulnerability quotient |
|                                                           | 1985                                                                                                                                                                                                                                | 1                         | Metal w/ aluminum awning  | 3,828.00      | 25%                    |
| SFHA                                                      | Building value: \$407,153                                                                                                                                                                                                           |                           | Contents value: \$300,000 |               |                        |
|                                                           | Probability of this risk?                                                                                                                                                                                                           | Degree of Impact          | Percent of loss           | Value of loss | NOTES                  |
| Dam Failure                                               | 0%                                                                                                                                                                                                                                  | 0%                        | 0.00%                     | 0             |                        |
| Drought                                                   | 50%                                                                                                                                                                                                                                 | 0%                        | 25.00%                    | 176,788       |                        |
| Earthquake                                                | 50%                                                                                                                                                                                                                                 | 40%                       | 45.00%                    | 318,219       |                        |
| Extreme heat                                              | 70%                                                                                                                                                                                                                                 | 10%                       | 40.00%                    | 282,861       |                        |
| Flooding                                                  | 50%                                                                                                                                                                                                                                 | 0%                        | 25.00%                    | 176,788       |                        |
| Hail                                                      | 70%                                                                                                                                                                                                                                 | 40%                       | 55.00%                    | 388,934       |                        |
| High winds                                                | 50%                                                                                                                                                                                                                                 | 30%                       | 40.00%                    | 282,861       |                        |
| Lightning                                                 | 50%                                                                                                                                                                                                                                 | 30%                       | 40.00%                    | 282,861       |                        |
| Tornado                                                   | 70%                                                                                                                                                                                                                                 | 80%                       | 75.00%                    | 530,365       |                        |
| Wildfires                                                 | 20%                                                                                                                                                                                                                                 | 60%                       | 40.00%                    | 282,861       |                        |
| Winter storms                                             | 60%                                                                                                                                                                                                                                 | 20%                       | 40.00%                    | 282,861       |                        |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION                       |                                                             |                                     |                                                  |                                  |                                              |                                |
|--------------------------------------------------------|-------------------------------------------------------------|-------------------------------------|--------------------------------------------------|----------------------------------|----------------------------------------------|--------------------------------|
| <b>FACILITY LOCATION:</b> 18001 E 149th, Newalla 74857 |                                                             |                                     | <b>FACILITY NAME:</b> Stella Grocery / Food Mart |                                  |                                              |                                |
| Latitude: 35° 19' 9.732                                |                                                             | COUNTY: Cleveland                   |                                                  |                                  |                                              |                                |
|                                                        |                                                             |                                     | Longitude: 97° 12' 41.1732                       |                                  |                                              |                                |
| <b>WHY CRITICAL:</b>                                   | Emergency Service                                           | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service          | <input type="checkbox"/> Utility | <input checked="" type="checkbox"/> Resource | <input type="checkbox"/> Other |
| <b>ABOUT THE STRUCTURE:</b>                            | Vulnerability due to location, age and type of construction |                                     |                                                  |                                  |                                              |                                |
| Location:                                              | Year built:                                                 | Stories:                            | Type of Construction:                            | Square Feet:                     | Vulnerability Quotient                       |                                |
|                                                        | 1991                                                        | 1                                   | Block                                            | 4,000                            | 35%                                          |                                |
| SFHA                                                   | Building value: \$61,988                                    |                                     | Contents value: \$147,000                        |                                  |                                              |                                |
|                                                        | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                  | Value of loss                    | NOTES                                        |                                |
| Dam Failure                                            | 0%                                                          | 0%                                  | 0%                                               | 0                                |                                              |                                |
| Drought                                                | 50%                                                         | 10%                                 | 30%                                              | 62,696                           |                                              |                                |
| Earthquake                                             | 50%                                                         | 40%                                 | 45%                                              | 94,045                           |                                              |                                |
| Extreme heat                                           | 70%                                                         | 10%                                 | 40%                                              | 83,595                           |                                              |                                |
| Flooding                                               | 50%                                                         | 40%                                 | 45%                                              | 94,045                           |                                              |                                |
| Hail                                                   | 70%                                                         | 20%                                 | 45%                                              | 94,045                           |                                              |                                |
| High winds                                             | 50%                                                         | 30%                                 | 40%                                              | 83,595                           |                                              |                                |
| Lightning                                              | 50%                                                         | 20%                                 | 35%                                              | 73,146                           |                                              |                                |
| Tornado                                                | 70%                                                         | 90%                                 | 80%                                              | 167,190                          |                                              |                                |
| Wildfires                                              | 20%                                                         | 60%                                 | 40%                                              | 83,595                           |                                              |                                |
| Winter storms                                          | 60%                                                         | 40%                                 | 50%                                              | 104,494                          |                                              |                                |

Hazard Mitigation Specialists, LLC

Submitted by: \_\_\_\_\_

| CRITICAL FACILITY IDENTIFICATION                               |                                                             |                                     |                                                  |                                  |                                   |                                |
|----------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------|--------------------------------------------------|----------------------------------|-----------------------------------|--------------------------------|
| <b>FACILITY LOCATION:</b> 17777 South Harrah Road ,<br>Newalla |                                                             |                                     | <b>FACILITY NAME:</b> Little Axe Fire Department |                                  |                                   |                                |
| Latitude: 35° 17' 27.2188                                      |                                                             |                                     | <b>COUNTY:</b> Cleveland                         |                                  |                                   |                                |
|                                                                |                                                             |                                     | Longitude: 97° 9' 34.4707                        |                                  |                                   |                                |
| <b>WHY CRITICAL:</b>                                           | <input checked="" type="checkbox"/> Emergency Service       | <input type="checkbox"/> Government | <input type="checkbox"/> Health Service          | <input type="checkbox"/> Utility | <input type="checkbox"/> Resource | <input type="checkbox"/> Other |
| <b>ABOUT THE STRUCTURE:</b>                                    | Vulnerability due to location, age and type of construction |                                     |                                                  |                                  |                                   |                                |
| <b>Location:</b>                                               | <b>Year built:</b>                                          | <b>Stories:</b>                     | <b>Type of Construction:</b>                     | <b>Square Feet:</b>              | <b>Potential Loss %</b>           |                                |
|                                                                | 1972                                                        | 1                                   | Metal / steel span                               | 2,880                            | 40%                               |                                |
| <b>SFHA</b>                                                    | <b>Building value:</b> \$70,000                             |                                     |                                                  | <b>Contents value:</b> \$400,000 |                                   |                                |
|                                                                | Probability of this risk?                                   | Degree of Impact                    | Percent of loss                                  | Value of loss                    | NOTES                             |                                |
| <b>Dam Failure</b>                                             | 0%                                                          | 0%                                  | 0%                                               | 0                                |                                   |                                |
| <b>Drought</b>                                                 | 50%                                                         | 10%                                 | 30%                                              | 141,000                          |                                   |                                |
| <b>Earthquake</b>                                              | 50%                                                         | 40%                                 | 45%                                              | 211,500                          |                                   |                                |
| <b>Extreme heat</b>                                            | 70%                                                         | 10%                                 | 40%                                              | 188,000                          |                                   |                                |
| <b>Flooding</b>                                                | 50%                                                         | 40%                                 | 45%                                              | 211,500                          |                                   |                                |
| <b>Hail</b>                                                    | 70%                                                         | 20%                                 | 45%                                              | 211,500                          |                                   |                                |
| <b>High winds</b>                                              | 50%                                                         | 30%                                 | 40%                                              | 188,000                          |                                   |                                |
| <b>Lightning</b>                                               | 50%                                                         | 20%                                 | 35%                                              | 164,500                          |                                   |                                |
| <b>Tornado</b>                                                 | 70%                                                         | 90%                                 | 80%                                              | 376,000                          |                                   |                                |
| <b>Wildfires</b>                                               | 20%                                                         | 60%                                 | 40%                                              | 188,000                          |                                   |                                |
| <b>Winter storms</b>                                           | 60%                                                         | 40%                                 | 50%                                              | 235,000                          |                                   |                                |

Hazard Mitigation Specialists, LLC

Submitted by: \_\_\_\_\_

| CRITICAL FACILITY IDENTIFICATION                                    |                                                                                                                                                                                                                                                | FACILITY NAME:            |                             |               |       |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------|---------------|-------|
| FACILITY LOCATION: 12001 Slaughtererville Road,<br>Slaughtererville |                                                                                                                                                                                                                                                | COUNTY: Cleveland         |                             |               |       |
| Latitude: 35 5' 16" N                                               |                                                                                                                                                                                                                                                | Longitude: - 97 15' 54" W |                             |               |       |
| WHY CRITICAL:                                                       | <input checked="" type="checkbox"/> Emergency Service <input type="checkbox"/> Government <input type="checkbox"/> Health Service <input type="checkbox"/> Utility <input checked="" type="checkbox"/> Resource <input type="checkbox"/> Other |                           |                             |               |       |
| ABOUT THE STRUCTURE:                                                | Vulnerability due to location, age and type of construction                                                                                                                                                                                    |                           |                             |               |       |
| Location:                                                           | Year built:                                                                                                                                                                                                                                    | Stories:                  | Type of Construction:       |               |       |
|                                                                     | 1968                                                                                                                                                                                                                                           | 1                         | Masonry                     |               |       |
|                                                                     |                                                                                                                                                                                                                                                |                           | Square Feet: 1,248          |               |       |
|                                                                     |                                                                                                                                                                                                                                                |                           | Vulnerability quotient: 35% |               |       |
| SFHA                                                                | Building value: \$58,933                                                                                                                                                                                                                       |                           | Contents value: \$39,290    |               |       |
|                                                                     | Probability of this risk?                                                                                                                                                                                                                      | Degree of Impact          | Percent of loss             | Value of loss | NOTES |
| Dam Failure                                                         | 0%                                                                                                                                                                                                                                             | 0%                        | 0%                          | 0             |       |
| Drought                                                             | 50%                                                                                                                                                                                                                                            | 10%                       | 30%                         | 29,467        |       |
| Earthquake                                                          | 50%                                                                                                                                                                                                                                            | 30%                       | 40%                         | 39,289        |       |
| Extreme heat                                                        | 70%                                                                                                                                                                                                                                            | 30%                       | 50%                         | 49,112        |       |
| Flooding                                                            | 50%                                                                                                                                                                                                                                            | 30%                       | 40%                         | 39,289        |       |
| Hail                                                                | 70%                                                                                                                                                                                                                                            | 30%                       | 50%                         | 49,112        |       |
| High winds                                                          | 60%                                                                                                                                                                                                                                            | 50%                       | 55%                         | 54,023        |       |
| Lightning                                                           | 70%                                                                                                                                                                                                                                            | 20%                       | 45%                         | 44,200        |       |
| Tornado                                                             | 70%                                                                                                                                                                                                                                            | 90%                       | 80%                         | 78,578        |       |
| Wildfires                                                           | 20%                                                                                                                                                                                                                                            | 60%                       | 40%                         | 39,289        |       |
| Winter storms                                                       | 60%                                                                                                                                                                                                                                            | 40%                       | 50%                         | 49,112        |       |

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| CRITICAL FACILITY IDENTIFICATION       |                                                                                                                                                                                                                                                | FACILITY NAME:               |                            |               |                        |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------|---------------|------------------------|
| 13190 Cemetery Road,<br>Slaughterville |                                                                                                                                                                                                                                                | Communication Tower          |                            |               |                        |
| FACILITY LOCATION:                     |                                                                                                                                                                                                                                                | COUNTY: Cleveland            |                            |               |                        |
| Latitude: 35 06 58.504" N              |                                                                                                                                                                                                                                                | Longitude: - 97 14 58.916" W |                            |               |                        |
| WHY CRITICAL:                          | <input checked="" type="checkbox"/> Emergency Service <input type="checkbox"/> Government <input type="checkbox"/> Health Service <input type="checkbox"/> Utility <input type="checkbox"/> Resource <input checked="" type="checkbox"/> Other |                              |                            |               |                        |
| ABOUT THE STRUCTURE:                   | Vulnerability due to location, age and type of construction                                                                                                                                                                                    |                              |                            |               |                        |
| Location:                              | Year built:                                                                                                                                                                                                                                    | Stories:                     | Type of Construction:      | Square Feet:  | Vulnerability quotient |
|                                        | 2006                                                                                                                                                                                                                                           |                              | Tower - auxiliary building | 16            | 10%                    |
| SFHA                                   | Building value: \$50,000                                                                                                                                                                                                                       |                              | Contents value: \$25,000   |               |                        |
|                                        | Probability of this risk?                                                                                                                                                                                                                      | Degree of Impact             | Percent of loss            | Value of loss | NOTES                  |
| Dam Failure                            | 0%                                                                                                                                                                                                                                             | 0%                           | 0%                         | 0             |                        |
| Drought                                | 50%                                                                                                                                                                                                                                            | 10%                          | 30%                        | 22,500        |                        |
| Earthquake                             | 50%                                                                                                                                                                                                                                            | 30%                          | 40%                        | 30,000        |                        |
| Extreme heat                           | 70%                                                                                                                                                                                                                                            | 10%                          | 40%                        | 30,000        |                        |
| Flooding                               | 50%                                                                                                                                                                                                                                            | 30%                          | 40%                        | 30,000        |                        |
| Hail                                   | 70%                                                                                                                                                                                                                                            | 30%                          | 50%                        | 37,500        |                        |
| High winds                             | 60%                                                                                                                                                                                                                                            | 50%                          | 55%                        | 41,250        |                        |
| Lightning                              | 70%                                                                                                                                                                                                                                            | 20%                          | 45%                        | 33,750        |                        |
| Tornado                                | 70%                                                                                                                                                                                                                                            | 90%                          | 80%                        | 60,000        |                        |
| Wildfires                              | 20%                                                                                                                                                                                                                                            | 60%                          | 40%                        | 30,000        |                        |
| Winter storms                          | 60%                                                                                                                                                                                                                                            | 40%                          | 50%                        | 37,500        |                        |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION                                    |                                                                                                                                                                                                                                     | FACILITY NAME:                 |                           |               |                        |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------|---------------|------------------------|
| FACILITY LOCATION: 12021 Slaughterterville Rd,<br>Slaughterterville |                                                                                                                                                                                                                                     | FACILITY NAME: Fire Station #1 |                           |               |                        |
| Latitude: 35 05' 16" N                                              |                                                                                                                                                                                                                                     | COUNTY: Cleveland              |                           |               |                        |
|                                                                     |                                                                                                                                                                                                                                     | Longitude: 97°19'41.1708       |                           |               |                        |
| WHY CRITICAL:                                                       | <input checked="" type="checkbox"/> Emergency Service <input type="checkbox"/> Government <input type="checkbox"/> Health Service <input type="checkbox"/> Utility <input type="checkbox"/> Resource <input type="checkbox"/> Other |                                |                           |               |                        |
| ABOUT THE STRUCTURE:                                                | Vulnerability due to location, age and type of construction                                                                                                                                                                         |                                |                           |               |                        |
| Location:                                                           | Year built:                                                                                                                                                                                                                         | Stories:                       | Type of Construction:     | Square Feet:  | Vulnerability quotient |
|                                                                     | 1978                                                                                                                                                                                                                                | 1                              | Steel frame               | 1,600         | 40%                    |
| SFHA                                                                | Building value: \$94,622                                                                                                                                                                                                            |                                | Contents value: \$253,725 |               |                        |
|                                                                     | Probability of this risk?                                                                                                                                                                                                           | Degree of Impact               | Percent of loss           | Value of loss | NOTES                  |
| Dam Failure                                                         | 0%                                                                                                                                                                                                                                  | 0%                             | 0%                        | 0             |                        |
| Drought                                                             | 50%                                                                                                                                                                                                                                 | 10%                            | 30%                       | 104,504       |                        |
| Earthquake                                                          | 50%                                                                                                                                                                                                                                 | 30%                            | 40%                       | 139,339       |                        |
| Extreme heat                                                        | 70%                                                                                                                                                                                                                                 | 10%                            | 40%                       | 139,339       |                        |
| Flooding                                                            | 50%                                                                                                                                                                                                                                 | 30%                            | 40%                       | 139,339       |                        |
| Hail                                                                | 70%                                                                                                                                                                                                                                 | 30%                            | 50%                       | 174,174       |                        |
| High winds                                                          | 50%                                                                                                                                                                                                                                 | 50%                            | 50%                       | 174,174       |                        |
| Lightning                                                           | 50%                                                                                                                                                                                                                                 | 20%                            | 35%                       | 121,921       |                        |
| Tornado                                                             | 70%                                                                                                                                                                                                                                 | 90%                            | 80%                       | 278,678       |                        |
| Wildfires                                                           | 20%                                                                                                                                                                                                                                 | 60%                            | 40%                       | 139,339       |                        |
| Winter storms                                                       | 60%                                                                                                                                                                                                                                 | 40%                            | 50%                       | 174,174       |                        |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION                         |                                                                                                                                                                                                                                     | FACILITY NAME:                 |                               |               |       |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------------------|---------------|-------|
| FACILITY LOCATION: 9001 Cemetery Road,<br>Slaughterville |                                                                                                                                                                                                                                     | FACILITY NAME: Fire Station #2 |                               |               |       |
| Latitude: 35 07' 02.87" N                                |                                                                                                                                                                                                                                     | COUNTY: Cleveland              | Longitude: - 97° 18' 30.42" W |               |       |
| WHY CRITICAL:                                            | <input checked="" type="checkbox"/> Emergency Service <input type="checkbox"/> Government <input type="checkbox"/> Health Service <input type="checkbox"/> Utility <input type="checkbox"/> Resource <input type="checkbox"/> Other |                                |                               |               |       |
| ABOUT THE STRUCTURE:                                     | Vulnerability due to location, age and type of construction                                                                                                                                                                         |                                |                               |               |       |
| Location:                                                | Year built:                                                                                                                                                                                                                         | Stories:                       | Type of Construction:         |               |       |
|                                                          | 1991                                                                                                                                                                                                                                | 1                              | Steel frame                   |               |       |
|                                                          |                                                                                                                                                                                                                                     |                                | Square Feet: 3,600            |               |       |
|                                                          |                                                                                                                                                                                                                                     |                                | Vulnerability quotient: 40%   |               |       |
| SFHA                                                     | Building value: \$175,480                                                                                                                                                                                                           |                                | Contents value: \$414,184     |               |       |
|                                                          | Probability of this risk?                                                                                                                                                                                                           | Degree of Impact               | Percent of loss               | Value of loss | NOTES |
| Dam Failure                                              | 0%                                                                                                                                                                                                                                  | 0%                             | 0%                            | 0             |       |
| Drought                                                  | 50%                                                                                                                                                                                                                                 | 10%                            | 30%                           | 176,899       |       |
| Earthquake                                               | 50%                                                                                                                                                                                                                                 | 30%                            | 40%                           | 235,866       |       |
| Extreme heat                                             | 70%                                                                                                                                                                                                                                 | 10%                            | 40%                           | 235,866       |       |
| Flooding                                                 | 50%                                                                                                                                                                                                                                 | 30%                            | 40%                           | 235,866       |       |
| Hail                                                     | 70%                                                                                                                                                                                                                                 | 30%                            | 50%                           | 294,832       |       |
| High winds                                               | 50%                                                                                                                                                                                                                                 | 50%                            | 50%                           | 294,832       |       |
| Lightning                                                | 50%                                                                                                                                                                                                                                 | 20%                            | 35%                           | 206,382       |       |
| Tornado                                                  | 70%                                                                                                                                                                                                                                 | 90%                            | 80%                           | 471,731       |       |
| Wildfires                                                | 20%                                                                                                                                                                                                                                 | 60%                            | 40%                           | 235,866       |       |
| Winter storms                                            | 60%                                                                                                                                                                                                                                 | 40%                            | 50%                           | 294,832       |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION                          |                                                                                                                                                                                                                                     |                           |                                                   |               |                        |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------|---------------|------------------------|
| <b>FACILITY LOCATION:</b> 10701 US Hwy 77, Slaughterville |                                                                                                                                                                                                                                     |                           | <b>FACILITY NAME:</b> Town Hall & Fire Station #3 |               |                        |
| Latitude: 35 05' 19" N                                    |                                                                                                                                                                                                                                     | COUNTY: Cleveland         |                                                   |               |                        |
|                                                           |                                                                                                                                                                                                                                     | Longitude: - 97 20' 11" W |                                                   |               |                        |
| <b>WHY CRITICAL:</b>                                      | <input checked="" type="checkbox"/> Emergency Service <input type="checkbox"/> Government <input type="checkbox"/> Health Service <input type="checkbox"/> Utility <input type="checkbox"/> Resource <input type="checkbox"/> Other |                           |                                                   |               |                        |
| <b>ABOUT THE STRUCTURE:</b>                               | Vulnerability due to location, age and type of construction                                                                                                                                                                         |                           |                                                   |               |                        |
| Location:                                                 | Year built:                                                                                                                                                                                                                         | Stories:                  | Type of Construction:                             | Square Feet:  | Vulnerability quotient |
|                                                           | 1997                                                                                                                                                                                                                                | 1                         | Steel frame                                       | 600           | 25%                    |
| SFHA                                                      | Building value: \$303,903                                                                                                                                                                                                           |                           | Contents value: \$544,697                         |               |                        |
|                                                           | Probability of this risk?                                                                                                                                                                                                           | Degree of Impact          | Percent of loss                                   | Value of loss | NOTES                  |
| Dam Failure                                               | 0%                                                                                                                                                                                                                                  | 0%                        | 0%                                                | 0             |                        |
| Drought                                                   | 50%                                                                                                                                                                                                                                 | 10%                       | 30%                                               | 254,580       |                        |
| Earthquake                                                | 50%                                                                                                                                                                                                                                 | 30%                       | 40%                                               | 339,440       |                        |
| Extreme heat                                              | 70%                                                                                                                                                                                                                                 | 10%                       | 40%                                               | 339,440       |                        |
| Flooding                                                  | 50%                                                                                                                                                                                                                                 | 30%                       | 40%                                               | 339,440       |                        |
| Hail                                                      | 70%                                                                                                                                                                                                                                 | 30%                       | 50%                                               | 424,300       |                        |
| High winds                                                | 50%                                                                                                                                                                                                                                 | 50%                       | 50%                                               | 424,300       |                        |
| Lightning                                                 | 50%                                                                                                                                                                                                                                 | 20%                       | 35%                                               | 297,010       |                        |
| Tornado                                                   | 70%                                                                                                                                                                                                                                 | 90%                       | 80%                                               | 678,880       |                        |
| Wildfires                                                 | 20%                                                                                                                                                                                                                                 | 60%                       | 40%                                               | 339,440       |                        |
| Winter storms                                             | 60%                                                                                                                                                                                                                                 | 40%                       | 50%                                               | 424,300       |                        |

Hazard Mitigation Specialists, LLC



**CRITICAL FACILITY IDENTIFICATION**

**FACILITY NAME:** Four Star Quickstop

**FACILITY LOCATION:** 10650 U S Hwy 77, Slaughterville  
 Latitude: 35 5' 15.7" N

**COUNTY:** Cleveland  
 Longitude: - 97 20' 15.4" W

**WHY CRITICAL:**  **Emergency Service**     **Government**     **Health Service**     **Utility**     **Resource**     **Other**

**ABOUT THE STRUCTURE:** Vulnerability due to location, age and type of construction

| Location: | Year built: | Stories: | Type of Construction: | Square Feet: | Vulnerability quotient |
|-----------|-------------|----------|-----------------------|--------------|------------------------|
|           | 2007        | 1        | Steel frame           | 2,400        | 15%                    |

SFHA      Building value: \$298,233      Contents value: \$100,000

|               | Probability of this risk? | Degree of Impact | Percent of loss | Value of loss | NOTES |
|---------------|---------------------------|------------------|-----------------|---------------|-------|
| Dam Failure   | 0%                        | 0%               | 0%              | 0             |       |
| Drought       | 50%                       | 10%              | 30%             | 119,470       |       |
| Earthquake    | 50%                       | 30%              | 40%             | 159,293       |       |
| Extreme heat  | 70%                       | 30%              | 50%             | 199,117       |       |
| Flooding      | 50%                       | 30%              | 40%             | 159,293       |       |
| Hail          | 70%                       | 30%              | 50%             | 199,117       |       |
| High winds    | 60%                       | 50%              | 55%             | 219,028       |       |
| Lightning     | 70%                       | 20%              | 45%             | 179,205       |       |
| Tornado       | 70%                       | 90%              | 80%             | 318,586       |       |
| Wildfires     | 20%                       | 60%              | 40%             | 159,293       |       |
| Winter storms | 60%                       | 40%              | 50%             | 199,117       |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION                     |                                                                                                                                                                                                                                                | FACILITY NAME: Maguire Farm Store |                           |               |                        |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------|---------------|------------------------|
| FACILITY LOCATION: 9551 Maguire Road, Slaughterville |                                                                                                                                                                                                                                                | COUNTY: Cleveland                 |                           |               |                        |
| Latitude: 35 7' 54.2" N                              |                                                                                                                                                                                                                                                | Longitude: - 97 18' 3.5" W        |                           |               |                        |
| WHY CRITICAL:                                        | <input checked="" type="checkbox"/> Emergency Service <input type="checkbox"/> Government <input type="checkbox"/> Health Service <input type="checkbox"/> Utility <input checked="" type="checkbox"/> Resource <input type="checkbox"/> Other |                                   |                           |               |                        |
| ABOUT THE STRUCTURE:                                 | Vulnerability due to location, age and type of construction                                                                                                                                                                                    |                                   |                           |               |                        |
| Location:                                            | Year built:                                                                                                                                                                                                                                    | Stories:                          | Type of Construction:     | Square Feet:  | Vulnerability quotient |
|                                                      | 1970                                                                                                                                                                                                                                           | 1                                 | Steel frame               | 3,600         | 40%                    |
| SFHA                                                 | Building value: \$124,359                                                                                                                                                                                                                      |                                   | Contents value: \$108,976 |               |                        |
|                                                      | Probability of this risk?                                                                                                                                                                                                                      | Degree of Impact                  | Percent of loss           | Value of loss | NOTES                  |
| Dam Failure                                          | 0%                                                                                                                                                                                                                                             | 0%                                | 0%                        | 0             |                        |
| Drought                                              | 50%                                                                                                                                                                                                                                            | 10%                               | 30%                       | 70,001        |                        |
| Earthquake                                           | 50%                                                                                                                                                                                                                                            | 30%                               | 40%                       | 93,334        |                        |
| Extreme heat                                         | 70%                                                                                                                                                                                                                                            | 30%                               | 50%                       | 116,668       |                        |
| Flooding                                             | 50%                                                                                                                                                                                                                                            | 30%                               | 40%                       | 93,334        |                        |
| Hail                                                 | 70%                                                                                                                                                                                                                                            | 30%                               | 50%                       | 116,668       |                        |
| High winds                                           | 60%                                                                                                                                                                                                                                            | 50%                               | 55%                       | 128,334       |                        |
| Lightning                                            | 70%                                                                                                                                                                                                                                            | 20%                               | 45%                       | 105,001       |                        |
| Tornado                                              | 70%                                                                                                                                                                                                                                            | 90%                               | 80%                       | 186,668       |                        |
| Wildfires                                            | 20%                                                                                                                                                                                                                                            | 60%                               | 40%                       | 93,334        |                        |
| Winter storms                                        | 60%                                                                                                                                                                                                                                            | 40%                               | 50%                       | 116,668       |                        |


Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION            |                                                             | FACILITY NAME: Moore Wastewater Treatment |                             |               |                        |       |
|---------------------------------------------|-------------------------------------------------------------|-------------------------------------------|-----------------------------|---------------|------------------------|-------|
| FACILITY LOCATION: 4000 S Service Rd, Moore |                                                             | COUNTY: Cleveland                         |                             |               |                        |       |
| Latitude: 35.3147 N                         |                                                             | Longitude:                                |                             | - 97.4883 W   |                        |       |
| WHY CRITICAL:                               | Emergency Service                                           | Government                                | Health Service              | Utility       | Resource               | Other |
| ABOUT THE STRUCTURE:                        | Vulnerability due to location, age and type of construction |                                           |                             |               |                        |       |
| Location:                                   | Year built:                                                 | Stories:                                  | Type of Construction:       | Square Feet:  | Vulnerability quotient |       |
|                                             | 2013                                                        | Multi levels                              | Concrete                    | 6,000         | 10%                    |       |
| SFHA                                        | Building value: \$50,000,000                                |                                           | Contents value: \$3,000,000 |               |                        |       |
|                                             | Probability of this risk?                                   | Degree of Impact                          | Percent of loss             | Value of loss | NOTES                  |       |
| Dam Failure                                 | 10%                                                         | 30%                                       | 20.00%                      | 10,600,000    |                        |       |
| Drought                                     | 60%                                                         | 10%                                       | 35.00%                      | 18,550,000    |                        |       |
| Earthquake                                  | 60%                                                         | 30%                                       | 45.00%                      | 23,850,000    |                        |       |
| Extreme heat                                | 80%                                                         | 20%                                       | 50.00%                      | 26,500,000    |                        |       |
| Flooding                                    | 30%                                                         | 40%                                       | 35.00%                      | 18,550,000    |                        |       |
| Hail                                        | 80%                                                         | 20%                                       | 50.00%                      | 26,500,000    |                        |       |
| High winds                                  | 50%                                                         | 20%                                       | 35.00%                      | 18,550,000    |                        |       |
| Lightning                                   | 60%                                                         | 10%                                       | 35.00%                      | 18,550,000    |                        |       |
| Tornado                                     | 70%                                                         | 80%                                       | 75.00%                      | 39,750,000    |                        |       |
| Wildfires                                   | 10%                                                         | 20%                                       | 15.00%                      | 7,950,000     |                        |       |
| Winter storms                               | 50%                                                         | 60%                                       | 55.00%                      | 29,150,000    |                        |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION            |                                                             | FACILITY NAME:        |                       |                           |                        |       |
|---------------------------------------------|-------------------------------------------------------------|-----------------------|-----------------------|---------------------------|------------------------|-------|
| FACILITY LOCATION: 4000 S Service Rd, Moore |                                                             | COUNTY: Cleveland     |                       |                           |                        |       |
| Latitude: 35.3147 N                         |                                                             | Longitude: -97.4883 W |                       |                           |                        |       |
| WHY CRITICAL:                               | Emergency Service                                           | Government            | Health Service        | Utility                   | Resource               | Other |
| ABOUT THE STRUCTURE:                        | Vulnerability due to location, age and type of construction |                       |                       |                           |                        |       |
| Location:                                   | Year built:                                                 | Stories:              | Type of Construction: | Square Feet:              | Vulnerability quotient |       |
|                                             | 1999                                                        | 1                     | Metal frame           | 3,000                     | 10%                    |       |
| SFHA                                        | Building value: \$200,000                                   |                       |                       | Contents value: \$175,000 |                        |       |
|                                             | Probability of this risk?                                   | Degree of Impact      | Percent of loss       | Value of loss             | NOTES                  |       |
| Dam Failure                                 | 10%                                                         | 30%                   | 20.00%                | 75,000                    |                        |       |
| Drought                                     | 60%                                                         | 10%                   | 35.00%                | 131,250                   |                        |       |
| Earthquake                                  | 60%                                                         | 30%                   | 45.00%                | 168,750                   |                        |       |
| Extreme heat                                | 80%                                                         | 20%                   | 50.00%                | 187,500                   |                        |       |
| Flooding                                    | 30%                                                         | 40%                   | 35.00%                | 131,250                   |                        |       |
| Hail                                        | 80%                                                         | 20%                   | 50.00%                | 187,500                   |                        |       |
| High winds                                  | 50%                                                         | 20%                   | 35.00%                | 131,250                   |                        |       |
| Lightning                                   | 60%                                                         | 10%                   | 35.00%                | 131,250                   |                        |       |
| Tornado                                     | 70%                                                         | 80%                   | 75.00%                | 281,250                   |                        |       |
| Wildfires                                   | 10%                                                         | 20%                   | 15.00%                | 56,250                    |                        |       |
| Winter storms                               | 50%                                                         | 60%                   | 55.00%                | 206,250                   |                        |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             |                          |                       |                           |                                                                                      | FACILITY NAME: Moore Chamber of Commerce |  |
|----------------------------------|-------------------------------------------------------------|--------------------------|-----------------------|---------------------------|--------------------------------------------------------------------------------------|------------------------------------------|--|
| FACILITY LOCATION:               |                                                             | 313 W Main Street, Moore |                       |                           | COUNTY: Cleveland                                                                    |                                          |  |
|                                  | Latitude:                                                   | 35.3385 N                |                       | Longitude:                |                                                                                      | - 97.4907 W                              |  |
| WHY CRITICAL:                    | Emergency Service                                           | Government               | Health Service        | Utility                   | Resource                                                                             | Other                                    |  |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                          |                       |                           |                                                                                      |                                          |  |
| Location:                        | Year built:                                                 | Stories:                 | Type of Construction: | Square Feet:              | Vulnerability quotient                                                               |                                          |  |
|                                  | 2006                                                        | 1                        | Wood frame            | 2,318.00                  | 20%                                                                                  |                                          |  |
| SFHA                             | Building value: \$198,780                                   |                          |                       | Contents value: \$238,560 |                                                                                      |                                          |  |
|                                  | Probability of this risk?                                   | Degree of Impact         | Percent of loss       | Value of loss             | NOTES                                                                                |                                          |  |
| Dam Failure                      | 10%                                                         | 30%                      | 20.00%                | 87,468                    |                                                                                      |                                          |  |
| Drought                          | 60%                                                         | 10%                      | 35.00%                | 153,069                   |                                                                                      |                                          |  |
| Earthquake                       | 60%                                                         | 30%                      | 45.00%                | 196,803                   |  |                                          |  |
| Extreme heat                     | 80%                                                         | 20%                      | 50.00%                | 218,670                   |                                                                                      |                                          |  |
| Flooding                         | 30%                                                         | 40%                      | 35.00%                | 153,069                   |                                                                                      |                                          |  |
| Hail                             | 80%                                                         | 20%                      | 50.00%                | 218,670                   |                                                                                      |                                          |  |
| High winds                       | 50%                                                         | 20%                      | 35.00%                | 153,069                   |                                                                                      |                                          |  |
| Lightning                        | 60%                                                         | 10%                      | 35.00%                | 153,069                   |                                                                                      |                                          |  |
| Tornado                          | 70%                                                         | 40%                      | 55.00%                | 240,537                   |                                                                                      |                                          |  |
| Wildfires                        | 10%                                                         | 20%                      | 15.00%                | 65,601                    |                                                                                      |                                          |  |
| Winter storms                    | 50%                                                         | 30%                      | 40.00%                | 174,936                   |                                                                                      |                                          |  |

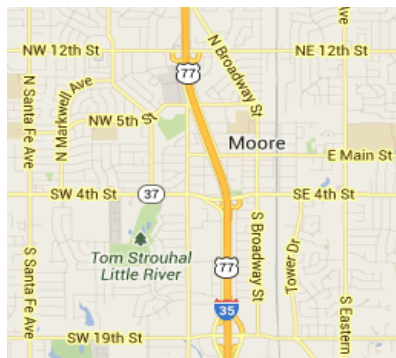
Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION                                                 |                           | FACILITY NAME: (Moore) Chiropractic Arts Center |                           |               |                        |
|----------------------------------------------------------------------------------|---------------------------|-------------------------------------------------|---------------------------|---------------|------------------------|
| FACILITY LOCATION: 804 N E 23rd, Moore                                           |                           | COUNTY: Cleveland                               |                           |               |                        |
| Latitude: 35.3590 N                                                              |                           | Longitude:                                      |                           | - 97.4763 W   |                        |
| WHY CRITICAL:                                                                    | Emergency Service         | Government                                      | Health Service            | Utility       | Resource Other         |
| ABOUT THE STRUCTURE: Vulnerability due to location, age and type of construction |                           |                                                 |                           |               |                        |
| Location:                                                                        | Year built:               | Stories:                                        | Type of Construction:     | Square Feet:  | Vulnerability quotient |
|                                                                                  | 1986                      | 1                                               | Wood frame                | 2,070         | 50%                    |
| SFHA                                                                             | Building value: \$113,908 |                                                 | Contents value: \$212,000 |               |                        |
|                                                                                  | Probability of this risk? | Degree of Impact                                | Percent of loss           | Value of loss | NOTES                  |
| Dam Failure                                                                      | 10%                       | 30%                                             | 20.00%                    | 65,182        |                        |
| Drought                                                                          | 60%                       | 10%                                             | 35.00%                    | 114,068       |                        |
| Earthquake                                                                       | 60%                       | 30%                                             | 45.00%                    | 146,659       |                        |
| Extreme heat                                                                     | 80%                       | 20%                                             | 50.00%                    | 162,954       |                        |
| Flooding                                                                         | 30%                       | 40%                                             | 35.00%                    | 114,068       |                        |
| Hail                                                                             | 80%                       | 20%                                             | 50.00%                    | 162,954       |                        |
| High winds                                                                       | 50%                       | 20%                                             | 35.00%                    | 114,068       |                        |
| Lightning                                                                        | 60%                       | 10%                                             | 35.00%                    | 114,068       |                        |
| Tornado                                                                          | 70%                       | 50%                                             | 60.00%                    | 195,545       |                        |
| Wildfires                                                                        | 10%                       | 20%                                             | 15.00%                    | 48,886        |                        |
| Winter storms                                                                    | 50%                       | 20%                                             | 35.00%                    | 114,068       |                        |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             |                  |                       |                             |                        |       |
|----------------------------------|-------------------------------------------------------------|------------------|-----------------------|-----------------------------|------------------------|-------|
| <b>FACILITY LOCATION:</b>        |                                                             |                  | <b>FACILITY NAME:</b> |                             |                        |       |
| 301 N Broadway, Moore            |                                                             |                  | Moore City Hall       |                             |                        |       |
| Latitude: 35.3408N               |                                                             |                  | COUNTY: Cleveland     |                             |                        |       |
| Longitude: -97.4871 W            |                                                             |                  |                       |                             |                        |       |
| <b>WHY CRITICAL:</b>             | Emergency Service                                           | Government       | Health Service        | Utility                     | Resource               | Other |
| <b>ABOUT THE STRUCTURE:</b>      | Vulnerability due to location, age and type of construction |                  |                       |                             |                        |       |
| Location:                        | Year built:                                                 | Stories:         | Type of Construction: | Square Feet:                | Vulnerability quotient |       |
|                                  | 1986                                                        | 2                | Brick & steel         | 26,758                      | 35%                    |       |
| SFHA                             | Building value: \$4,470,000                                 |                  |                       | Contents value: \$2,380,000 |                        |       |
|                                  | Probability of this risk?                                   | Degree of Impact | Percent of loss       | Value of loss               | NOTES                  |       |
| Dam Failure                      | 10%                                                         | 30%              | 20.00%                | 1,370,000                   |                        |       |
| Drought                          | 60%                                                         | 10%              | 35.00%                | 2,397,500                   |                        |       |
| Earthquake                       | 60%                                                         | 30%              | 45.00%                | 3,082,500                   |                        |       |
| Extreme heat                     | 80%                                                         | 20%              | 50.00%                | 3,425,000                   |                        |       |
| Flooding                         | 30%                                                         | 40%              | 35.00%                | 2,397,500                   |                        |       |
| Hail                             | 80%                                                         | 20%              | 50.00%                | 3,425,000                   |                        |       |
| High winds                       | 50%                                                         | 20%              | 35.00%                | 2,397,500                   |                        |       |
| Lightning                        | 60%                                                         | 10%              | 35.00%                | 2,397,500                   |                        |       |
| Tornado                          | 70%                                                         | 80%              | 75.00%                | 5,137,500                   |                        |       |
| Wildfires                        | 10%                                                         | 20%              | 15.00%                | 1,027,500                   |                        |       |
| Winter storms                    | 50%                                                         | 60%              | 55.00%                | 3,767,500                   |                        |       |

Hazard Mitigation Specialists, LLC



| CRITICAL FACILITY IDENTIFICATION |                                                             | FACILITY NAME:           |                                              |               |       |
|----------------------------------|-------------------------------------------------------------|--------------------------|----------------------------------------------|---------------|-------|
| 301 S Howard, Moore              |                                                             | (Moore) Community Center |                                              |               |       |
| FACILITY LOCATION:               | 301 S Howard, Moore                                         | COUNTY:                  | Cleveland                                    |               |       |
|                                  | Latitude: 35.3382 N                                         | Longitude:               | - 97.4803 W                                  |               |       |
| WHY CRITICAL:                    | Emergency Service                                           | Government               | Health Service                               |               |       |
|                                  |                                                             | Utility                  | Resource                                     |               |       |
|                                  |                                                             |                          | Other Potential Shelter / Emergency Location |               |       |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                          |                                              |               |       |
| Location:                        | Year built:                                                 | Stories:                 | Type of Construction:                        |               |       |
|                                  | 1981                                                        | 1                        | Concrete block                               |               |       |
|                                  |                                                             |                          | Square Feet:                                 |               |       |
|                                  |                                                             |                          | 17,982                                       |               |       |
|                                  |                                                             |                          | Vulnerability quotient                       |               |       |
|                                  |                                                             |                          | 35%                                          |               |       |
| SFHA                             | Building value:                                             | \$2,600,000              | Contents value: \$1,987,600                  |               |       |
|                                  | Probability of this risk?                                   | Degree of Impact         | Percent of loss                              | Value of loss | NOTES |
| Dam Failure                      | 10%                                                         | 30%                      | 20%                                          | 917,520       |       |
| Drought                          | 60%                                                         | 10%                      | 35%                                          | 1,605,660     |       |
| Earthquake                       | 60%                                                         | 30%                      | 45%                                          | 2,064,420     |       |
| Extreme heat                     | 80%                                                         | 10%                      | 45%                                          | 2,064,420     |       |
| Flooding                         | 30%                                                         | 40%                      | 35%                                          | 1,605,660     |       |
| Hail                             | 80%                                                         | 20%                      | 50%                                          | 2,293,800     |       |
| High winds                       | 50%                                                         | 20%                      | 35%                                          | 1,605,660     |       |
| Lightning                        | 60%                                                         | 10%                      | 35%                                          | 1,605,660     |       |
| Tornado                          | 70%                                                         | 40%                      | 55%                                          | 2,523,180     |       |
| Wildfires                        | 10%                                                         | 20%                      | 15%                                          | 688,140       |       |
| Winter storms                    | 50%                                                         | 30%                      | 40%                                          | 1,835,040     |       |

Hazard Mitigation Specialists, LLC



| CRITICAL FACILITY IDENTIFICATION |                                                             | FACILITY NAME:      |                                                  |               |       |
|----------------------------------|-------------------------------------------------------------|---------------------|--------------------------------------------------|---------------|-------|
| 1315 N Eastern, Moore            |                                                             | (Moore) Crest Foods |                                                  |               |       |
| FACILITY LOCATION:               | 1315 N Eastern, Moore                                       | COUNTY:             | Cleveland                                        |               |       |
|                                  | Latitude: 35.3498 N                                         | Longitude:          | - 97.4786 W                                      |               |       |
| WHY CRITICAL:                    | Emergency Service                                           | Government          | Health Service                                   |               |       |
|                                  |                                                             | Utility             | Resource (Grocery, pharmacy, emergency supplies) |               |       |
|                                  |                                                             |                     | Other                                            |               |       |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                     |                                                  |               |       |
| Location:                        | Year built:                                                 | Stories:            | Type of Construction:                            |               |       |
|                                  | 1990                                                        | 1                   | Masonry                                          |               |       |
|                                  |                                                             |                     | Square Feet:                                     |               |       |
|                                  |                                                             |                     | 55,518                                           |               |       |
|                                  |                                                             |                     | Vulnerability quotient                           |               |       |
|                                  |                                                             |                     | 20%                                              |               |       |
| SFHA                             | Building value:                                             | \$3,144,718         | Contents value:                                  |               |       |
|                                  |                                                             |                     | \$2,190,543                                      |               |       |
|                                  | Probability of this risk?                                   | Degree of Impact    | Percent of loss                                  | Value of loss | NOTES |
| Dam Failure                      | 10%                                                         | 30%                 | 20.00%                                           | 1,067,052     |       |
| Drought                          | 60%                                                         | 10%                 | 35.00%                                           | 1,867,341     |       |
| Earthquake                       | 60%                                                         | 30%                 | 45.00%                                           | 2,400,867     |       |
| Extreme heat                     | 80%                                                         | 10%                 | 45.00%                                           | 2,400,867     |       |
| Flooding                         | 30%                                                         | 40%                 | 35.00%                                           | 1,867,341     |       |
| Hail                             | 80%                                                         | 20%                 | 50.00%                                           | 2,667,631     |       |
| High winds                       | 50%                                                         | 20%                 | 35.00%                                           | 1,867,341     |       |
| Lightning                        | 60%                                                         | 10%                 | 35.00%                                           | 1,867,341     |       |
| Tornado                          | 70%                                                         | 40%                 | 55.00%                                           | 2,934,394     |       |
| Wildfires                        | 10%                                                         | 20%                 | 15.00%                                           | 800,289       |       |
| Winter storms                    | 50%                                                         | 30%                 | 40.00%                                           | 2,134,104     |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             | FACILITY NAME:   |                                                  |               |       |
|----------------------------------|-------------------------------------------------------------|------------------|--------------------------------------------------|---------------|-------|
| 1040 S W 19th, Moore             |                                                             | (Moore) CVS #1   |                                                  |               |       |
| FACILITY LOCATION:               | 1040 S W 19th, Moore                                        | COUNTY:          | Cleveland                                        |               |       |
|                                  | Latitude: 35.3192 N                                         | Longitude:       | - 97.5113 W                                      |               |       |
| WHY CRITICAL:                    | Emergency Service                                           | Government       | Health Service                                   |               |       |
|                                  |                                                             | Utility          | Resource (Grocery, pharmacy, emergency supplies) |               |       |
|                                  |                                                             |                  | Other                                            |               |       |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                  |                                                  |               |       |
| Location:                        | Year built:                                                 | Stories:         | Type of Construction:                            |               |       |
|                                  | 2004                                                        | 1                | Masonry                                          |               |       |
|                                  |                                                             |                  | Square Feet:                                     |               |       |
|                                  |                                                             |                  | 14,490                                           |               |       |
|                                  |                                                             |                  | Vulnerability quotient                           |               |       |
|                                  |                                                             |                  | 10%                                              |               |       |
| SFHA                             | Building value:                                             | \$2,064,832      | Contents value:                                  |               |       |
|                                  |                                                             |                  | \$1,049,587                                      |               |       |
|                                  | Probability of this risk?                                   | Degree of Impact | Percent of loss                                  | Value of loss | NOTES |
| Dam Failure                      | 10%                                                         | 30%              | 20.00%                                           | 622,884       |       |
| Drought                          | 60%                                                         | 10%              | 35.00%                                           | 1,090,047     |       |
| Earthquake                       | 60%                                                         | 30%              | 45.00%                                           | 1,401,489     |       |
| Extreme heat                     | 80%                                                         | 10%              | 45.00%                                           | 1,401,489     |       |
| Flooding                         | 30%                                                         | 40%              | 35.00%                                           | 1,090,047     |       |
| Hail                             | 80%                                                         | 20%              | 50.00%                                           | 1,557,210     |       |
| High winds                       | 50%                                                         | 20%              | 35.00%                                           | 1,090,047     |       |
| Lightning                        | 60%                                                         | 10%              | 35.00%                                           | 1,090,047     |       |
| Tornado                          | 70%                                                         | 40%              | 55.00%                                           | 1,712,930     |       |
| Wildfires                        | 10%                                                         | 20%              | 15.00%                                           | 467,163       |       |
| Winter storms                    | 50%                                                         | 30%              | 40.00%                                           | 1,245,768     |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             | FACILITY NAME:   |                                                  |               |       |
|----------------------------------|-------------------------------------------------------------|------------------|--------------------------------------------------|---------------|-------|
| 800 S E 4, Moore                 |                                                             | (Moore) CVS #2   |                                                  |               |       |
| <b>FACILITY LOCATION:</b>        | 800 S E 4, Moore                                            | <b>COUNTY:</b>   | Cleveland                                        |               |       |
|                                  | Latitude: 35.3337 N                                         | Longitude:       | - 97.4763 W                                      |               |       |
| <b>WHY CRITICAL:</b>             | Emergency Service                                           | Government       | Health Service                                   |               |       |
|                                  |                                                             | Utility          | Resource (Grocery, pharmacy, emergency supplies) |               |       |
|                                  |                                                             |                  | Other                                            |               |       |
| <b>ABOUT THE STRUCTURE:</b>      | Vulnerability due to location, age and type of construction |                  |                                                  |               |       |
| Location:                        | Year built:                                                 | Stories:         | Type of Construction:                            |               |       |
|                                  | 1996                                                        | 1                | Masonry                                          |               |       |
|                                  |                                                             |                  | Square Feet: 9,842                               |               |       |
|                                  |                                                             |                  | Vulnerability quotient: 20%                      |               |       |
| SFHA                             | Building value:                                             | \$2,064,832      | Contents value: \$1,049,587                      |               |       |
|                                  | Probability of this risk?                                   | Degree of Impact | Percent of loss                                  | Value of loss | NOTES |
| Dam Failure                      | 10%                                                         | 30%              | 20.00%                                           | 622,884       |       |
| Drought                          | 60%                                                         | 10%              | 35.00%                                           | 1,090,047     |       |
| Earthquake                       | 60%                                                         | 30%              | 45.00%                                           | 1,401,489     |       |
| Extreme heat                     | 80%                                                         | 10%              | 45.00%                                           | 1,401,489     |       |
| Flooding                         | 30%                                                         | 40%              | 35.00%                                           | 1,090,047     |       |
| Hail                             | 80%                                                         | 20%              | 50.00%                                           | 1,557,210     |       |
| High winds                       | 50%                                                         | 20%              | 35.00%                                           | 1,090,047     |       |
| Lightning                        | 60%                                                         | 10%              | 35.00%                                           | 1,090,047     |       |
| Tornado                          | 70%                                                         | 40%              | 55.00%                                           | 1,712,930     |       |
| Wildfires                        | 10%                                                         | 20%              | 15.00%                                           | 467,163       |       |
| Winter storms                    | 50%                                                         | 30%              | 40.00%                                           | 1,245,768     |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION           |                                                             | FACILITY NAME: (Moore) Dycus-Camp Medical Clinic |                           |               |                        |       |
|--------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|---------------------------|---------------|------------------------|-------|
| FACILITY LOCATION: 320 N Service Rd, Moore |                                                             | COUNTY: Cleveland                                |                           |               |                        |       |
| Latitude: 35.3412 N                        |                                                             | Longitude:                                       |                           | - 97.4919 W   |                        |       |
| WHY CRITICAL:                              | Emergency Service                                           | Government                                       | Health Service            | Utility       | Resource               | Other |
| ABOUT THE STRUCTURE:                       | Vulnerability due to location, age and type of construction |                                                  |                           |               |                        |       |
| Location:                                  | Year built:                                                 | Stories:                                         | Type of Construction:     | Square Feet:  | Vulnerability quotient |       |
|                                            | 1963                                                        | 1                                                | Masonry                   | 7,720         | 65%                    |       |
| SFHA                                       | Building value: \$200,000                                   |                                                  | Contents value: \$225,000 |               |                        |       |
|                                            | Probability of this risk?                                   | Degree of Impact                                 | Percent of loss           | Value of loss | NOTES                  |       |
| Dam Failure                                | 10%                                                         | 30%                                              | 20.00%                    | 85,000        |                        |       |
| Drought                                    | 60%                                                         | 10%                                              | 35.00%                    | 148,750       |                        |       |
| Earthquake                                 | 60%                                                         | 30%                                              | 45.00%                    | 191,250       |                        |       |
| Extreme heat                               | 80%                                                         | 20%                                              | 50.00%                    | 212,500       |                        |       |
| Flooding                                   | 30%                                                         | 40%                                              | 35.00%                    | 148,750       |                        |       |
| Hail                                       | 80%                                                         | 20%                                              | 50.00%                    | 212,500       |                        |       |
| High winds                                 | 50%                                                         | 20%                                              | 35.00%                    | 148,750       |                        |       |
| Lightning                                  | 60%                                                         | 10%                                              | 35.00%                    | 148,750       |                        |       |
| Tornado                                    | 70%                                                         | 50%                                              | 60.00%                    | 255,000       |                        |       |
| Wildfires                                  | 10%                                                         | 20%                                              | 15.00%                    | 63,750        |                        |       |
| Winter storms                              | 50%                                                         | 20%                                              | 35.00%                    | 148,750       |                        |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             |                            |                       |                           |                        | FACILITY NAME: Midwest City EMS |  |
|----------------------------------|-------------------------------------------------------------|----------------------------|-----------------------|---------------------------|------------------------|---------------------------------|--|
| FACILITY LOCATION:               |                                                             | 1805 S. Eastern Ave, Moore |                       |                           | COUNTY: Cleveland      |                                 |  |
|                                  | Latitude:                                                   | 35.3217 N                  |                       | Longitude:                |                        | - 97.4767 15:J5                 |  |
| WHY CRITICAL:                    | Emergency Service                                           | Government                 | Health Service        | Utility                   | Resource               | Other                           |  |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                            |                       |                           |                        |                                 |  |
| Location:                        | Year built:                                                 | Stories:                   | Type of Construction: | Square Feet:              | Vulnerability quotient |                                 |  |
|                                  | 1974                                                        | 1                          | Concrete block        | 4,320                     | 35%                    |                                 |  |
| SFHA                             | Building value: \$630,000                                   |                            |                       | Contents value: \$487,000 |                        |                                 |  |
|                                  | Probability of this risk?                                   | Degree of Impact           | Percent of loss       | Value of loss             | NOTES                  |                                 |  |
| Dam Failure                      | 10%                                                         | 30%                        | 20.00%                | 223,400                   |                        |                                 |  |
| Drought                          | 60%                                                         | 10%                        | 35.00%                | 390,950                   |                        |                                 |  |
| Earthquake                       | 60%                                                         | 30%                        | 45.00%                | 502,650                   |                        |                                 |  |
| Extreme heat                     | 80%                                                         | 20%                        | 50.00%                | 558,500                   |                        |                                 |  |
| Flooding                         | 30%                                                         | 40%                        | 35.00%                | 390,950                   |                        |                                 |  |
| Hail                             | 80%                                                         | 20%                        | 50.00%                | 558,500                   |                        |                                 |  |
| High winds                       | 50%                                                         | 20%                        | 35.00%                | 390,950                   |                        |                                 |  |
| Lightning                        | 60%                                                         | 10%                        | 35.00%                | 390,950                   |                        |                                 |  |
| Tornado                          | 70%                                                         | 80%                        | 75.00%                | 837,750                   |                        |                                 |  |
| Wildfires                        | 10%                                                         | 20%                        | 15.00%                | 167,550                   |                        |                                 |  |
| Winter storms                    | 50%                                                         | 60%                        | 55.00%                | 614,350                   |                        |                                 |  |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION                                                 |                             | FACILITY NAME: Moore Fire Station #1 + Administration |                       |                             |                        |       |
|----------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------|-----------------------|-----------------------------|------------------------|-------|
| FACILITY LOCATION: 2400 S. Fritts Blvd, Moore                                    |                             | COUNTY: Cleveland                                     |                       |                             |                        |       |
| Latitude: 35°19' N                                                               |                             | Longitude: 97°29' W                                   |                       |                             |                        |       |
| WHY CRITICAL:                                                                    | Emergency Service           | Government                                            | Health Service        | Utility                     | Resource               | Other |
| ABOUT THE STRUCTURE: Vulnerability due to location, age and type of construction |                             |                                                       |                       |                             |                        |       |
| Location:                                                                        | Year built:                 | Stories:                                              | Type of Construction: | Square Feet:                | Vulnerability quotient |       |
|                                                                                  | 2011                        | 1                                                     | Concrete, Type II     | 18,798                      | 10%                    |       |
| SFHA                                                                             | Building value: \$2,500,000 |                                                       |                       | Contents value: \$3,000,000 |                        |       |
|                                                                                  | Probability of this risk?   | Degree of Impact                                      | Percent of loss       | Value of loss               | NOTES                  |       |
| Dam Failure                                                                      | 10%                         | 30%                                                   | 20.00%                | 1,100,000                   |                        |       |
| Drought                                                                          | 60%                         | 10%                                                   | 35.00%                | 1,925,000                   |                        |       |
| Earthquake                                                                       | 60%                         | 30%                                                   | 45.00%                | 2,475,000                   |                        |       |
| Extreme heat                                                                     | 80%                         | 20%                                                   | 50.00%                | 2,750,000                   |                        |       |
| Flooding                                                                         | 30%                         | 40%                                                   | 35.00%                | 1,925,000                   |                        |       |
| Hail                                                                             | 80%                         | 20%                                                   | 50.00%                | 2,750,000                   |                        |       |
| High winds                                                                       | 50%                         | 20%                                                   | 35.00%                | 1,925,000                   |                        |       |
| Lightning                                                                        | 60%                         | 10%                                                   | 35.00%                | 1,925,000                   |                        |       |
| Tornado                                                                          | 70%                         | 80%                                                   | 75.00%                | 4,125,000                   |                        |       |
| Wildfires                                                                        | 10%                         | 20%                                                   | 15.00%                | 825,000                     |                        |       |
| Winter storms                                                                    | 50%                         | 60%                                                   | 55.00%                | 3,025,000                   |                        |       |

Hazard Mitigation Specialists, LLC



| CRITICAL FACILITY IDENTIFICATION                                                 |                           | FACILITY NAME: Moore Fire Station #2 |                             |               |                        |       |
|----------------------------------------------------------------------------------|---------------------------|--------------------------------------|-----------------------------|---------------|------------------------|-------|
| FACILITY LOCATION: 725 N W 12, Moore                                             |                           | COUNTY: Cleveland                    |                             |               |                        |       |
| Latitude: 35*20' N                                                               |                           | Longitude: 97*30' W                  |                             |               |                        |       |
| WHY CRITICAL:                                                                    | Emergency Service         | Government                           | Health Service              | Utility       | Resource               | Other |
| ABOUT THE STRUCTURE: Vulnerability due to location, age and type of construction |                           |                                      |                             |               |                        |       |
| Location:                                                                        | Year built:               | Stories:                             | Type of Construction:       | Square Feet:  | Vulnerability quotient |       |
|                                                                                  | 1970                      | 1                                    | Concrete, Type II           | 3,900         | 35%                    |       |
| SFHA                                                                             | Building value: \$700,000 |                                      | Contents value: \$1,250,000 |               |                        |       |
|                                                                                  | Probability of this risk? | Degree of Impact                     | Percent of loss             | Value of loss | NOTES                  |       |
| Dam Failure                                                                      | 10%                       | 30%                                  | 20.00%                      | 390,000       |                        |       |
| Drought                                                                          | 60%                       | 10%                                  | 35.00%                      | 682,500       |                        |       |
| Earthquake                                                                       | 60%                       | 30%                                  | 45.00%                      | 877,500       |                        |       |
| Extreme heat                                                                     | 80%                       | 20%                                  | 50.00%                      | 975,000       |                        |       |
| Flooding                                                                         | 30%                       | 40%                                  | 35.00%                      | 682,500       |                        |       |
| Hail                                                                             | 80%                       | 20%                                  | 50.00%                      | 975,000       |                        |       |
| High winds                                                                       | 50%                       | 20%                                  | 35.00%                      | 682,500       |                        |       |
| Lightning                                                                        | 60%                       | 10%                                  | 35.00%                      | 682,500       |                        |       |
| Tornado                                                                          | 70%                       | 80%                                  | 75.00%                      | 1,462,500     |                        |       |
| Wildfires                                                                        | 10%                       | 20%                                  | 15.00%                      | 292,500       |                        |       |
| Winter storms                                                                    | 50%                       | 60%                                  | 55.00%                      | 1,072,500     |                        |       |

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| CRITICAL FACILITY IDENTIFICATION              |                                                             | FACILITY NAME:        |                             |               |       |
|-----------------------------------------------|-------------------------------------------------------------|-----------------------|-----------------------------|---------------|-------|
| FACILITY LOCATION: 2901 S Sunnyland Rd, Moore |                                                             | Moore Fire Station #3 |                             |               |       |
| Latitude: 35.3182 N                           |                                                             | COUNTY: Cleveland     |                             |               |       |
|                                               |                                                             | Longitude:            | -97.4413341                 |               |       |
| WHY CRITICAL:                                 | Emergency Service                                           | Government            | Health Service              |               |       |
|                                               |                                                             | Utility               | Resource                    |               |       |
|                                               |                                                             |                       | Other                       |               |       |
| ABOUT THE STRUCTURE:                          | Vulnerability due to location, age and type of construction |                       |                             |               |       |
| Location:                                     | Year built:                                                 | Stories:              | Type of Construction:       |               |       |
|                                               | 2011                                                        | 1                     | Concrete, Type II           |               |       |
|                                               |                                                             |                       | Square Feet: 8,662          |               |       |
|                                               |                                                             |                       | Vulnerability quotient: 10% |               |       |
| SFHA                                          | Building value: \$2,500,000                                 |                       | Contents value: \$2,750,000 |               |       |
|                                               | Probability of this risk?                                   | Degree of Impact      | Percent of loss             | Value of loss | NOTES |
| Dam Failure                                   | 10%                                                         | 30%                   | 20.00%                      | 1,050,000     |       |
| Drought                                       | 60%                                                         | 10%                   | 35.00%                      | 1,837,500     |       |
| Earthquake                                    | 60%                                                         | 30%                   | 45.00%                      | 2,362,500     |       |
| Extreme heat                                  | 80%                                                         | 20%                   | 50.00%                      | 2,625,000     |       |
| Flooding                                      | 30%                                                         | 40%                   | 35.00%                      | 1,837,500     |       |
| Hail                                          | 80%                                                         | 20%                   | 50.00%                      | 2,625,000     |       |
| High winds                                    | 50%                                                         | 20%                   | 35.00%                      | 1,837,500     |       |
| Lightning                                     | 60%                                                         | 10%                   | 35.00%                      | 1,837,500     |       |
| Tornado                                       | 70%                                                         | 80%                   | 75.00%                      | 3,937,500     |       |
| Wildfires                                     | 10%                                                         | 20%                   | 15.00%                      | 787,500       |       |
| Winter storms                                 | 50%                                                         | 60%                   | 55.00%                      | 2,887,500     |       |

Hazard Mitigation Specialists, LLC



| CRITICAL FACILITY IDENTIFICATION        |                                                             | FACILITY NAME:        |                             |               |                        |       |
|-----------------------------------------|-------------------------------------------------------------|-----------------------|-----------------------------|---------------|------------------------|-------|
| FACILITY LOCATION: 1350 N Bryant, Moore |                                                             | COUNTY: Cleveland     |                             |               |                        |       |
| Latitude: 35.349 N                      |                                                             | Longitude: -97.4791 W |                             |               |                        |       |
| WHY CRITICAL:                           | Emergency Service                                           | Government            | Health Service              | Utility       | Resource               | Other |
| ABOUT THE STRUCTURE:                    | Vulnerability due to location, age and type of construction |                       |                             |               |                        |       |
| Location:                               | Year built:                                                 | Stories:              | Type of Construction:       | Square Feet:  | Vulnerability quotient |       |
|                                         | 2011                                                        | 1                     | Concrete, Type II           | 8,662         | 10%                    |       |
| SFHA                                    | Building value: \$2,500,000                                 |                       | Contents value: \$2,557,000 |               |                        |       |
|                                         | Probability of this risk?                                   | Degree of Impact      | Percent of loss             | Value of loss | NOTES                  |       |
| Dam Failure                             | 10%                                                         | 30%                   | 20.00%                      | 1,011,400     |                        |       |
| Drought                                 | 60%                                                         | 10%                   | 35.00%                      | 1,769,950     |                        |       |
| Earthquake                              | 60%                                                         | 30%                   | 45.00%                      | 2,275,650     |                        |       |
| Extreme heat                            | 80%                                                         | 20%                   | 50.00%                      | 2,528,500     |                        |       |
| Flooding                                | 30%                                                         | 40%                   | 35.00%                      | 1,769,950     |                        |       |
| Hail                                    | 80%                                                         | 20%                   | 50.00%                      | 2,528,500     |                        |       |
| High winds                              | 50%                                                         | 20%                   | 35.00%                      | 1,769,950     |                        |       |
| Lightning                               | 60%                                                         | 10%                   | 35.00%                      | 1,769,950     |                        |       |
| Tornado                                 | 70%                                                         | 80%                   | 75.00%                      | 3,792,750     |                        |       |
| Wildfires                               | 10%                                                         | 20%                   | 15.00%                      | 758,550       |                        |       |
| Winter storms                           | 50%                                                         | 60%                   | 55.00%                      | 2,781,350     |                        |       |

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| CRITICAL FACILITY IDENTIFICATION |                                                             | FACILITY NAME:    |                                                  |               |       |
|----------------------------------|-------------------------------------------------------------|-------------------|--------------------------------------------------|---------------|-------|
| 1219 N Santa Fe, Moore           |                                                             | (Moore) GFF Foods |                                                  |               |       |
| FACILITY LOCATION:               | 1219 N Santa Fe, Moore                                      | COUNTY:           | Cleveland                                        |               |       |
|                                  | Latitude: 35.3479 N                                         | Longitude:        | - 97.5121 W                                      |               |       |
| WHY CRITICAL:                    | Emergency Service                                           | Government        | Health Service                                   |               |       |
|                                  |                                                             | Utility           | Resource (Grocery, pharmacy, emergency supplies) |               |       |
|                                  |                                                             |                   | Other                                            |               |       |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                   |                                                  |               |       |
| Location:                        | Year built:                                                 | Stories:          | Type of Construction:                            |               |       |
|                                  | 1979                                                        | 1                 | Masonry                                          |               |       |
|                                  |                                                             |                   | Square Feet:                                     |               |       |
|                                  |                                                             |                   | 32,420                                           |               |       |
|                                  |                                                             |                   | Vulnerability quotient                           |               |       |
|                                  |                                                             |                   | 20%                                              |               |       |
| SFHA                             | Building value:                                             | \$949,696         | Contents value:                                  |               |       |
|                                  |                                                             |                   | \$721,378                                        |               |       |
|                                  | Probability of this risk?                                   | Degree of Impact  | Percent of loss                                  | Value of loss | NOTES |
| Dam Failure                      | 10%                                                         | 30%               | 20.00%                                           | 334,215       |       |
| Drought                          | 60%                                                         | 10%               | 35.00%                                           | 584,876       |       |
| Earthquake                       | 60%                                                         | 30%               | 45.00%                                           | 751,983       |       |
| Extreme heat                     | 80%                                                         | 10%               | 45.00%                                           | 751,983       |       |
| Flooding                         | 30%                                                         | 40%               | 35.00%                                           | 584,876       |       |
| Hail                             | 80%                                                         | 20%               | 50.00%                                           | 835,537       |       |
| High winds                       | 50%                                                         | 20%               | 35.00%                                           | 584,876       |       |
| Lightning                        | 60%                                                         | 10%               | 35.00%                                           | 584,876       |       |
| Tornado                          | 70%                                                         | 40%               | 55.00%                                           | 919,091       |       |
| Wildfires                        | 10%                                                         | 20%               | 15.00%                                           | 250,661       |       |
| Winter storms                    | 50%                                                         | 30%               | 40.00%                                           | 668,430       |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             |                   |                       |               |                        | FACILITY NAME: Home Depot Building Center |             |
|----------------------------------|-------------------------------------------------------------|-------------------|-----------------------|---------------|------------------------|-------------------------------------------|-------------|
| FACILITY LOCATION:               |                                                             | 650 S W 29, Moore |                       |               | COUNTY: Cleveland      |                                           |             |
|                                  | Latitude:                                                   | 35.3202 N         |                       | Longitude:    |                        | - 97.4967 W                               |             |
| WHY CRITICAL:                    | Emergency Service                                           | Government        | Health Service        | Utility       | Resource               | Other                                     |             |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                   |                       |               |                        |                                           |             |
| Location:                        | Year built:                                                 | Stories:          | Type of Construction: | Square Feet:  | Vulnerability quotient |                                           |             |
|                                  | 2005                                                        | 1                 | Masonry               | 131,450       | 10%                    |                                           |             |
| SFHA                             | Building value:                                             |                   | \$4,368,536           |               | Contents value:        |                                           | \$4,780,900 |
|                                  | Probability of this risk?                                   | Degree of Impact  | Percent of loss       | Value of loss | NOTES                  |                                           |             |
| Dam Failure                      | 10%                                                         | 30%               | 20.00%                | 1,829,887     |                        |                                           |             |
| Drought                          | 60%                                                         | 10%               | 35.00%                | 3,202,303     |                        |                                           |             |
| Earthquake                       | 60%                                                         | 30%               | 45.00%                | 4,117,246     |                        |                                           |             |
| Extreme heat                     | 80%                                                         | 10%               | 45.00%                | 4,117,246     |                        |                                           |             |
| Flooding                         | 30%                                                         | 40%               | 35.00%                | 3,202,303     |                        |                                           |             |
| Hail                             | 80%                                                         | 20%               | 50.00%                | 4,574,718     |                        |                                           |             |
| High winds                       | 50%                                                         | 20%               | 35.00%                | 3,202,303     |                        |                                           |             |
| Lightning                        | 60%                                                         | 10%               | 35.00%                | 3,202,303     |                        |                                           |             |
| Tornado                          | 70%                                                         | 40%               | 55.00%                | 5,032,190     |                        |                                           |             |
| Wildfires                        | 10%                                                         | 20%               | 15.00%                | 1,372,415     |                        |                                           |             |
| Winter storms                    | 50%                                                         | 30%               | 40.00%                | 3,659,774     |                        |                                           |             |

Hazard Mitigation Specialists, LLC



| CRITICAL FACILITY IDENTIFICATION                                                 |                             | FACILITY NAME: Lowe's Building Center |                             |               |       |
|----------------------------------------------------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------|-------|
| FACILITY LOCATION: 1501 S Service Rd, Moore                                      |                             | COUNTY: Cleveland                     |                             |               |       |
| Latitude: 35.3385 N                                                              |                             | Longitude: -97.4907 W                 |                             |               |       |
| WHY CRITICAL:                                                                    | Emergency Service           | Government                            | Health Service              |               |       |
|                                                                                  |                             |                                       | Utility                     |               |       |
|                                                                                  |                             |                                       | Resource                    |               |       |
|                                                                                  |                             |                                       | Other                       |               |       |
| ABOUT THE STRUCTURE: Vulnerability due to location, age and type of construction |                             |                                       |                             |               |       |
| Location:                                                                        | Year built:                 | Stories:                              | Type of Construction:       |               |       |
|                                                                                  | 2006                        | 1                                     | Masonry                     |               |       |
|                                                                                  |                             |                                       | Square Feet: 139,645        |               |       |
|                                                                                  |                             |                                       | Vulnerability quotient: 10% |               |       |
| SFHA                                                                             | Building value: \$5,319,010 |                                       | Contents value: \$4,659,100 |               |       |
|                                                                                  | Probability of this risk?   | Degree of Impact                      | Percent of loss             | Value of loss | NOTES |
| Dam Failure                                                                      | 10%                         | 30%                                   | 20.00%                      | 1,995,622     |       |
| Drought                                                                          | 60%                         | 10%                                   | 35.00%                      | 3,492,339     |       |
| Earthquake                                                                       | 60%                         | 30%                                   | 45.00%                      | 4,490,150     |       |
| Extreme heat                                                                     | 80%                         | 10%                                   | 45.00%                      | 4,490,150     |       |
| Flooding                                                                         | 30%                         | 40%                                   | 35.00%                      | 3,492,339     |       |
| Hail                                                                             | 80%                         | 20%                                   | 50.00%                      | 4,989,055     |       |
| High winds                                                                       | 50%                         | 20%                                   | 35.00%                      | 3,492,339     |       |
| Lightning                                                                        | 60%                         | 10%                                   | 35.00%                      | 3,492,339     |       |
| Tornado                                                                          | 70%                         | 40%                                   | 55.00%                      | 5,487,961     |       |
| Wildfires                                                                        | 10%                         | 20%                                   | 15.00%                      | 1,496,717     |       |
| Winter storms                                                                    | 50%                         | 30%                                   | 40.00%                      | 3,991,244     |       |

Hazard Mitigation Specialists, LLC


| CRITICAL FACILITY IDENTIFICATION                                                 |                           | FACILITY NAME: Moore Medical Center |                       |                       |                        |
|----------------------------------------------------------------------------------|---------------------------|-------------------------------------|-----------------------|-----------------------|------------------------|
| FACILITY LOCATION: 700 S Telephone Rd, Moore                                     |                           | COUNTY: Cleveland                   |                       |                       |                        |
| Latitude: 35.3322N                                                               |                           | Longitude:                          |                       | - 97.4933 W           |                        |
| WHY CRITICAL:                                                                    | Emergency Service         | Government                          | Health Service        | Utility               | Resource Other         |
| ABOUT THE STRUCTURE: Vulnerability due to location, age and type of construction |                           |                                     |                       |                       |                        |
| Location:                                                                        | Year built:               | Stories:                            | Type of Construction: | Square Feet:          | Vulnerability quotient |
|                                                                                  | 2013                      | 1                                   | Brick & steel         |                       |                        |
| SFHA                                                                             | Building value: _____     |                                     |                       | Contents value: _____ |                        |
|                                                                                  | Probability of this risk? | Degree of Impact                    | Percent of loss       | Value of loss         | NOTES                  |
| Dam Failure                                                                      | 10%                       | 30%                                 | 20%                   | 0                     |                        |
| Drought                                                                          | 60%                       | 10%                                 | 35%                   | 0                     |                        |
| Earthquake                                                                       | 60%                       | 30%                                 | 45%                   | 0                     |                        |
| Extreme heat                                                                     | 80%                       | 10%                                 | 45%                   | 0                     |                        |
| Flooding                                                                         | 30%                       | 40%                                 | 35%                   | 0                     |                        |
| Hail                                                                             | 80%                       | 20%                                 | 50%                   | 0                     |                        |
| High winds                                                                       | 50%                       | 20%                                 | 35%                   | 0                     |                        |
| Lightning                                                                        | 60%                       | 10%                                 | 35%                   | 0                     |                        |
| Tornado                                                                          | 70%                       | 40%                                 | 55%                   | 0                     |                        |
| Wildfires                                                                        | 10%                       | 20%                                 | 15%                   | 0                     |                        |
| Winter storms                                                                    | 50%                       | 30%                                 | 40%                   | 0                     |                        |

Hazard Mitigation Specialists, LLC

The Moore Medical Center was destroyed in the tornado event that struck the City of Moore in May, 2013. The medical center is currently providing medical care from temporary facilities. New construction is underway at the same location with completion expected in 2016.

This information will be updated as construction continues.



| CRITICAL FACILITY IDENTIFICATION                                                           |                                                             |                        |                       |                           |                                                                                      | FACILITY NAME: Moore Police Department |           |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------|-----------------------|---------------------------|--------------------------------------------------------------------------------------|----------------------------------------|-----------|
| FACILITY LOCATION:                                                                         |                                                             | 224 S. Chestnut, Moore |                       |                           | COUNTY:                                                                              |                                        | Cleveland |
|                                                                                            |                                                             | Latitude:              | 35.3361 N             | Longitude:                |                                                                                      | - 97.4899 W                            |           |
| NOTE: A new building for the Police Department is under construction as of December, 2013. |                                                             |                        |                       |                           |                                                                                      |                                        |           |
| WHY CRITICAL:                                                                              | Emergency Service                                           | Government             | Health Service        | Utility                   | Resource                                                                             | Other                                  |           |
| ABOUT THE STRUCTURE:                                                                       | Vulnerability due to location, age and type of construction |                        |                       |                           |                                                                                      |                                        |           |
| Location:                                                                                  | Year built:                                                 | Stories:               | Type of Construction: | Square Feet:              | Vulnerability quotient                                                               |                                        |           |
|                                                                                            | 1960                                                        | 1                      | Brick                 | 10,947                    | 35%                                                                                  |                                        |           |
| SFHA                                                                                       | Building value: \$487,917                                   |                        |                       | Contents value: \$625,000 |                                                                                      |                                        |           |
|                                                                                            | Probability of this risk?                                   | Degree of Impact       | Percent of loss       | Value of loss             | NOTES                                                                                |                                        |           |
| Dam Failure                                                                                | 10%                                                         | 30%                    | 20.00%                | 222,583                   |                                                                                      |                                        |           |
| Drought                                                                                    | 60%                                                         | 10%                    | 35.00%                | 389,521                   |                                                                                      |                                        |           |
| Earthquake                                                                                 | 60%                                                         | 30%                    | 45.00%                | 500,813                   |  |                                        |           |
| Extreme heat                                                                               | 80%                                                         | 20%                    | 50.00%                | 556,459                   |                                                                                      |                                        |           |
| Flooding                                                                                   | 30%                                                         | 40%                    | 35.00%                | 389,521                   |                                                                                      |                                        |           |
| Hail                                                                                       | 80%                                                         | 20%                    | 50.00%                | 556,459                   |                                                                                      |                                        |           |
| High winds                                                                                 | 50%                                                         | 20%                    | 35.00%                | 389,521                   |                                                                                      |                                        |           |
| Lightning                                                                                  | 60%                                                         | 10%                    | 35.00%                | 389,521                   |                                                                                      |                                        |           |
| Tornado                                                                                    | 70%                                                         | 80%                    | 75.00%                | 834,688                   |                                                                                      |                                        |           |
| Wildfires                                                                                  | 10%                                                         | 20%                    | 15.00%                | 166,938                   |                                                                                      |                                        |           |
| Winter storms                                                                              | 50%                                                         | 60%                    | 55.00%                | 612,104                   |                                                                                      |                                        |           |

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|                                                                                          |                                  |                                              |                        |                      |              |                                              |
|------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------|------------------------|----------------------|--------------|----------------------------------------------|
| <b>CRITICAL FACILITY IDENTIFICATION</b>                                                  |                                  | <b>FACILITY NAME:</b> (Moore) Public Library |                        |                      |              |                                              |
| <b>FACILITY LOCATION:</b> 225 S Howard, Moore                                            |                                  | <b>COUNTY:</b> Cleveland                     |                        |                      |              |                                              |
| Latitude: 35.3357 N                                                                      |                                  | Longitude: - 97.4884 W                       |                        |                      |              |                                              |
| <b>WHY CRITICAL:</b>                                                                     | Emergency Service                | Government                                   | Health Service         | Utility              | Resource     | Other Potential Shelter / Emergency Location |
| <b>ABOUT THE STRUCTURE:</b> Vulnerability due to location, age and type of construction  |                                  |                                              |                        |                      |              |                                              |
| Location: Year built: Stories: Type of Construction: Square Feet: Vulnerability quotient |                                  |                                              |                        |                      |              |                                              |
| 1967 1 Brick & steel 33,088 35%                                                          |                                  |                                              |                        |                      |              |                                              |
| SFHA Building value: \$4,270,000 Contents value: \$3,876,000                             |                                  |                                              |                        |                      |              |                                              |
|                                                                                          | <b>Probability of this risk?</b> | <b>Degree of Impact</b>                      | <b>Percent of loss</b> | <b>Value of loss</b> | <b>NOTES</b> |                                              |
| <b>Dam Failure</b>                                                                       | 10%                              | 30%                                          | 20%                    | 1,629,200            |              |                                              |
| <b>Drought</b>                                                                           | 60%                              | 10%                                          | 35%                    | 2,851,100            |              |                                              |
| <b>Earthquake</b>                                                                        | 60%                              | 30%                                          | 45%                    | 3,665,700            |              |                                              |
| <b>Extreme heat</b>                                                                      | 80%                              | 10%                                          | 45%                    | 3,665,700            |              |                                              |
| <b>Flooding</b>                                                                          | 30%                              | 40%                                          | 35%                    | 2,851,100            |              |                                              |
| <b>Hail</b>                                                                              | 80%                              | 20%                                          | 50%                    | 4,073,000            |              |                                              |
| <b>High winds</b>                                                                        | 50%                              | 20%                                          | 35%                    | 2,851,100            |              |                                              |
| <b>Lightning</b>                                                                         | 60%                              | 10%                                          | 35%                    | 2,851,100            |              |                                              |
| <b>Tornado</b>                                                                           | 70%                              | 40%                                          | 55%                    | 4,480,300            |              |                                              |
| <b>Wildfires</b>                                                                         | 10%                              | 20%                                          | 15%                    | 1,221,900            |              |                                              |
| <b>Winter storms</b>                                                                     | 50%                              | 30%                                          | 40%                    | 3,258,400            |              |                                              |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             |                      |                       |                             |                        | FACILITY NAME: Moore Public Safety Center |             |
|----------------------------------|-------------------------------------------------------------|----------------------|-----------------------|-----------------------------|------------------------|-------------------------------------------|-------------|
| FACILITY LOCATION:               |                                                             | 117 E Main St, Moore |                       |                             | COUNTY:                |                                           | Cleveland   |
|                                  |                                                             | Latitude: 35.3382 N  |                       | Longitude:                  |                        |                                           | - 97.4863 W |
| WHY CRITICAL:                    | Emergency Service                                           | Government           | Health Service        | Utility                     | Resource               | Other                                     |             |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                      |                       |                             |                        |                                           |             |
| Location:                        | Year built:                                                 | Stories:             | Type of Construction: | Square Feet:                | Vulnerability quotient |                                           |             |
|                                  | 2013                                                        | 2                    | Mortar                | 54,000                      | 10%                    |                                           |             |
| SFHA                             | Building value: \$12,000,000                                |                      |                       | Contents value: \$7,000,000 |                        |                                           |             |
|                                  | Probability of this risk?                                   | Degree of Impact     | Percent of loss       | Value of loss               | NOTES                  |                                           |             |
| Dam Failure                      | 10%                                                         | 30%                  | 20.00%                | 3,800,000                   |                        |                                           |             |
| Drought                          | 60%                                                         | 10%                  | 35.00%                | 6,650,000                   |                        |                                           |             |
| Earthquake                       | 60%                                                         | 30%                  | 45.00%                | 8,550,000                   |                        |                                           |             |
| Extreme heat                     | 80%                                                         | 20%                  | 50.00%                | 9,500,000                   |                        |                                           |             |
| Flooding                         | 30%                                                         | 40%                  | 35.00%                | 6,650,000                   |                        |                                           |             |
| Hail                             | 80%                                                         | 20%                  | 50.00%                | 9,500,000                   |                        |                                           |             |
| High winds                       | 50%                                                         | 20%                  | 35.00%                | 6,650,000                   |                        |                                           |             |
| Lightning                        | 60%                                                         | 10%                  | 35.00%                | 6,650,000                   |                        |                                           |             |
| Tornado                          | 70%                                                         | 80%                  | 75.00%                | 14,250,000                  |                        |                                           |             |
| Wildfires                        | 10%                                                         | 20%                  | 15.00%                | 2,850,000                   |                        |                                           |             |
| Winter storms                    | 50%                                                         | 60%                  | 55.00%                | 10,450,000                  |                        |                                           |             |

Hazard Mitigation Specialists, LLC



| CRITICAL FACILITY IDENTIFICATION            |                                                             |                  |                                          |               |                        |       |
|---------------------------------------------|-------------------------------------------------------------|------------------|------------------------------------------|---------------|------------------------|-------|
| <b>FACILITY LOCATION:</b> 512 N W 27, Moore |                                                             |                  | <b>FACILITY NAME:</b> Moore Public Works |               |                        |       |
| Latitude: 35.3626 N                         |                                                             |                  | <b>COUNTY:</b> Cleveland                 |               |                        |       |
|                                             |                                                             |                  | Longitude: - 97.4986 W                   |               |                        |       |
| <b>WHY CRITICAL:</b>                        | Emergency Service                                           | Government       | Health Service                           | Utility       | Resource               | Other |
| <b>ABOUT THE STRUCTURE:</b>                 | Vulnerability due to location, age and type of construction |                  |                                          |               |                        |       |
| Location:                                   | Year built:                                                 | Stories:         | Type of Construction:                    | Square Feet:  | Vulnerability quotient |       |
|                                             | 1974                                                        | 1                | Metal frame                              | 2,000         | 40%                    |       |
| SFHA                                        | Building value: \$293,000                                   |                  | Contents value: \$1,300,000              |               |                        |       |
|                                             | Probability of this risk?                                   | Degree of Impact | Percent of loss                          | Value of loss | NOTES                  |       |
| Dam Failure                                 | 10%                                                         | 30%              | 20.00%                                   | 318,600       |                        |       |
| Drought                                     | 60%                                                         | 10%              | 35.00%                                   | 557,550       |                        |       |
| Earthquake                                  | 60%                                                         | 30%              | 45.00%                                   | 716,850       |                        |       |
| Extreme heat                                | 80%                                                         | 20%              | 50.00%                                   | 796,500       |                        |       |
| Flooding                                    | 30%                                                         | 40%              | 35.00%                                   | 557,550       |                        |       |
| Hail                                        | 80%                                                         | 20%              | 50.00%                                   | 796,500       |                        |       |
| High winds                                  | 50%                                                         | 20%              | 35.00%                                   | 557,550       |                        |       |
| Lightning                                   | 60%                                                         | 10%              | 35.00%                                   | 557,550       |                        |       |
| Tornado                                     | 70%                                                         | 80%              | 75.00%                                   | 1,194,750     |                        |       |
| Wildfires                                   | 10%                                                         | 20%              | 15.00%                                   | 238,950       |                        |       |
| Winter storms                               | 50%                                                         | 60%              | 55.00%                                   | 876,150       |                        |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             |                         |                       |                             |                           | FACILITY NAME: Silver Star Construction |  |
|----------------------------------|-------------------------------------------------------------|-------------------------|-----------------------|-----------------------------|---------------------------|-----------------------------------------|--|
| FACILITY LOCATION:               |                                                             | 2401 S. Broadway, Moore |                       |                             | COUNTY: Cleveland         |                                         |  |
|                                  | Latitude:                                                   | 35.3573 N               |                       | Longitude:                  |                           | - 97.4981 W                             |  |
| WHY CRITICAL:                    | Emergency Service                                           | Government              | Health Service        | Utility                     | Resource Equipment Rental | Other                                   |  |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                         |                       |                             |                           |                                         |  |
| Location:                        | Year built:                                                 | Stories:                | Type of Construction: | Square Feet:                | Vulnerability quotient    |                                         |  |
|                                  | 1996                                                        | 1                       | Brick                 | 6,464                       | 20%                       |                                         |  |
| SFHA                             | Building value: \$462,890                                   |                         |                       | Contents value: \$1,124,500 |                           |                                         |  |
|                                  | Probability of this risk?                                   | Degree of Impact        | Percent of loss       | Value of loss               | NOTES                     |                                         |  |
| Dam Failure                      | 10%                                                         | 30%                     | 20.00%                | 317,478                     |                           |                                         |  |
| Drought                          | 60%                                                         | 10%                     | 35.00%                | 555,587                     |                           |                                         |  |
| Earthquake                       | 60%                                                         | 30%                     | 45.00%                | 714,326                     |                           |                                         |  |
| Extreme heat                     | 80%                                                         | 10%                     | 45.00%                | 714,326                     |                           |                                         |  |
| Flooding                         | 30%                                                         | 40%                     | 35.00%                | 555,587                     |                           |                                         |  |
| Hail                             | 80%                                                         | 20%                     | 50.00%                | 793,695                     |                           |                                         |  |
| High winds                       | 50%                                                         | 20%                     | 35.00%                | 555,587                     |                           |                                         |  |
| Lightning                        | 60%                                                         | 10%                     | 35.00%                | 555,587                     |                           |                                         |  |
| Tornado                          | 70%                                                         | 40%                     | 55.00%                | 873,065                     |                           |                                         |  |
| Wildfires                        | 10%                                                         | 20%                     | 15.00%                | 238,109                     |                           |                                         |  |
| Winter storms                    | 50%                                                         | 30%                     | 40.00%                | 634,956                     |                           |                                         |  |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION                                                 |                           | FACILITY NAME: Sunstate Equipment Rental |                       |               |       |
|----------------------------------------------------------------------------------|---------------------------|------------------------------------------|-----------------------|---------------|-------|
| FACILITY LOCATION: 2001 N Moore Ave, Moore                                       |                           | COUNTY: Cleveland                        |                       |               |       |
| Latitude: 35.3573 N                                                              |                           | Longitude: - 97.4981 W                   |                       |               |       |
| WHY CRITICAL:                                                                    | Emergency Service         | Government                               | Health Service        |               |       |
|                                                                                  |                           |                                          | Utility               |               |       |
|                                                                                  |                           |                                          | Resource              |               |       |
|                                                                                  |                           |                                          | Other                 |               |       |
| ABOUT THE STRUCTURE: Vulnerability due to location, age and type of construction |                           |                                          |                       |               |       |
| Location:                                                                        | Year built:               | Stories:                                 | Type of Construction: |               |       |
|                                                                                  | Square Feet:              | Vulnerability quotient                   |                       |               |       |
|                                                                                  | 1999                      | 1                                        | Metal / steel span    |               |       |
|                                                                                  |                           |                                          | 6,720                 |               |       |
|                                                                                  |                           |                                          | 25%                   |               |       |
| SFHA                                                                             | Building value: \$555,821 | Contents value: \$7,740,293              |                       |               |       |
|                                                                                  | Probability of this risk? | Degree of Impact                         | Percent of loss       | Value of loss | NOTES |
| Dam Failure                                                                      | 10%                       | 30%                                      | 20.00%                | 1,659,223     |       |
| Drought                                                                          | 60%                       | 10%                                      | 35.00%                | 2,903,640     |       |
| Earthquake                                                                       | 60%                       | 30%                                      | 45.00%                | 3,733,251     |       |
| Extreme heat                                                                     | 80%                       | 10%                                      | 45.00%                | 3,733,251     |       |
| Flooding                                                                         | 30%                       | 40%                                      | 35.00%                | 2,903,640     |       |
| Hail                                                                             | 80%                       | 20%                                      | 50.00%                | 4,148,057     |       |
| High winds                                                                       | 50%                       | 20%                                      | 35.00%                | 2,903,640     |       |
| Lightning                                                                        | 60%                       | 10%                                      | 35.00%                | 2,903,640     |       |
| Tornado                                                                          | 70%                       | 40%                                      | 55.00%                | 4,562,863     |       |
| Wildfires                                                                        | 10%                       | 20%                                      | 15.00%                | 1,244,417     |       |
| Winter storms                                                                    | 50%                       | 30%                                      | 40.00%                | 3,318,446     |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION                                                 |                             | FACILITY NAME: (Moore) Target Supercenter |                       |                             |                                                  |       |
|----------------------------------------------------------------------------------|-----------------------------|-------------------------------------------|-----------------------|-----------------------------|--------------------------------------------------|-------|
| FACILITY LOCATION: 720 S W 19th, Moore                                           |                             | COUNTY: Cleveland                         |                       |                             |                                                  |       |
| Latitude: 35.3197 N                                                              |                             | Longitude:                                |                       | - 97.5026 W                 |                                                  |       |
| WHY CRITICAL:                                                                    | Emergency Service           | Government                                | Health Service        | Utility                     | Resource (Grocery, pharmacy, emergency supplies) | Other |
| ABOUT THE STRUCTURE: Vulnerability due to location, age and type of construction |                             |                                           |                       |                             |                                                  |       |
| Location:                                                                        | Year built:                 | Stories:                                  | Type of Construction: | Square Feet:                | Vulnerability quotient                           |       |
|                                                                                  | 2011                        | 1                                         | Masonry               | 482,645                     | 10%                                              |       |
| SFHA                                                                             | Building value: \$6,137,445 |                                           |                       | Contents value: \$8,650,400 |                                                  |       |
|                                                                                  | Probability of this risk?   | Degree of Impact                          | Percent of loss       | Value of loss               | NOTES                                            |       |
| Dam Failure                                                                      | 10%                         | 30%                                       | 20.00%                | 2,957,569                   |                                                  |       |
| Drought                                                                          | 60%                         | 10%                                       | 35.00%                | 5,175,746                   |                                                  |       |
| Earthquake                                                                       | 60%                         | 30%                                       | 45.00%                | 6,654,530                   |                                                  |       |
| Extreme heat                                                                     | 80%                         | 10%                                       | 45.00%                | 6,654,530                   |                                                  |       |
| Flooding                                                                         | 30%                         | 40%                                       | 35.00%                | 5,175,746                   |                                                  |       |
| Hail                                                                             | 80%                         | 20%                                       | 50.00%                | 7,393,923                   |                                                  |       |
| High winds                                                                       | 50%                         | 20%                                       | 35.00%                | 5,175,746                   |                                                  |       |
| Lightning                                                                        | 60%                         | 10%                                       | 35.00%                | 5,175,746                   |                                                  |       |
| Tornado                                                                          | 70%                         | 40%                                       | 55.00%                | 8,133,315                   |                                                  |       |
| Wildfires                                                                        | 10%                         | 20%                                       | 15.00%                | 2,218,177                   |                                                  |       |
| Winter storms                                                                    | 50%                         | 30%                                       | 40.00%                | 5,915,138                   |                                                  |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             |                       |                       |                             |                                                  | FACILITY NAME: (Moore) Walgreen's #1 |  |
|----------------------------------|-------------------------------------------------------------|-----------------------|-----------------------|-----------------------------|--------------------------------------------------|--------------------------------------|--|
| FACILITY LOCATION:               |                                                             | 1229 N Eastern, Moore |                       |                             | COUNTY: Cleveland                                |                                      |  |
|                                  | Latitude:                                                   | 35.3483 N             |                       | Longitude:                  |                                                  | - 97.4776 W                          |  |
| WHY CRITICAL:                    | Emergency Service                                           | Government            | Health Service        | Utility                     | Resource (Grocery, pharmacy, emergency supplies) | Other                                |  |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                       |                       |                             |                                                  |                                      |  |
| Location:                        | Year built:                                                 | Stories:              | Type of Construction: | Square Feet:                | Vulnerability quotient                           |                                      |  |
|                                  | 2000                                                        | 1                     | Masonry               | 14,974                      | 20%                                              |                                      |  |
| SFHA                             | Building value: \$2,133,152                                 |                       |                       | Contents value: \$1,227,786 |                                                  |                                      |  |
|                                  | Probability of this risk?                                   | Degree of Impact      | Percent of loss       | Value of loss               | NOTES                                            |                                      |  |
| Dam Failure                      | 10%                                                         | 30%                   | 20%                   | 672,188                     |                                                  |                                      |  |
| Drought                          | 60%                                                         | 10%                   | 35%                   | 1,176,328                   |                                                  |                                      |  |
| Earthquake                       | 60%                                                         | 30%                   | 45%                   | 1,512,422                   |                                                  |                                      |  |
| Extreme heat                     | 80%                                                         | 10%                   | 45%                   | 1,512,422                   |                                                  |                                      |  |
| Flooding                         | 30%                                                         | 40%                   | 35%                   | 1,176,328                   |                                                  |                                      |  |
| Hail                             | 80%                                                         | 20%                   | 50%                   | 1,680,469                   |                                                  |                                      |  |
| High winds                       | 50%                                                         | 20%                   | 35%                   | 1,176,328                   |                                                  |                                      |  |
| Lightning                        | 60%                                                         | 10%                   | 35%                   | 1,176,328                   |                                                  |                                      |  |
| Tornado                          | 70%                                                         | 40%                   | 55%                   | 1,848,516                   |                                                  |                                      |  |
| Wildfires                        | 10%                                                         | 20%                   | 15%                   | 504,141                     |                                                  |                                      |  |
| Winter storms                    | 50%                                                         | 30%                   | 40%                   | 1,344,375                   |                                                  |                                      |  |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             | FACILITY NAME:        |                                                  |               |       |
|----------------------------------|-------------------------------------------------------------|-----------------------|--------------------------------------------------|---------------|-------|
| 1201 N W 12, Moore               |                                                             | (Moore) Walgreen's #2 |                                                  |               |       |
| FACILITY LOCATION:               | 1201 N W 12, Moore                                          | COUNTY:               | Cleveland                                        |               |       |
|                                  | Latitude: 35.3493 N                                         | Longitude:            | - 97.5127W                                       |               |       |
| WHY CRITICAL:                    | Emergency Service                                           | Government            | Health Service                                   |               |       |
|                                  |                                                             | Utility               | Resource (Grocery, pharmacy, emergency supplies) |               |       |
|                                  |                                                             |                       | Other                                            |               |       |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                       |                                                  |               |       |
| Location:                        | Year built:                                                 | Stories:              | Type of Construction:                            |               |       |
|                                  | 1995                                                        | 1                     | Masonry                                          |               |       |
|                                  |                                                             |                       | Square Feet:                                     |               |       |
|                                  |                                                             |                       | 13,756                                           |               |       |
|                                  |                                                             |                       | Vulnerability quotient                           |               |       |
|                                  |                                                             |                       | 20%                                              |               |       |
| SFHA                             | Building value:                                             | \$1,960,232           | Contents value: \$1,082,190                      |               |       |
|                                  | Probability of this risk?                                   | Degree of Impact      | Percent of loss                                  | Value of loss | NOTES |
| Dam Failure                      | 10%                                                         | 30%                   | 20%                                              | 608,484       |       |
| Drought                          | 60%                                                         | 10%                   | 35%                                              | 1,064,848     |       |
| Earthquake                       | 60%                                                         | 30%                   | 45%                                              | 1,369,090     |       |
| Extreme heat                     | 80%                                                         | 10%                   | 45%                                              | 1,369,090     |       |
| Flooding                         | 30%                                                         | 40%                   | 35%                                              | 1,064,848     |       |
| Hail                             | 80%                                                         | 20%                   | 50%                                              | 1,521,211     |       |
| High winds                       | 50%                                                         | 20%                   | 35%                                              | 1,064,848     |       |
| Lightning                        | 60%                                                         | 10%                   | 35%                                              | 1,064,848     |       |
| Tornado                          | 70%                                                         | 40%                   | 55%                                              | 1,673,332     |       |
| Wildfires                        | 10%                                                         | 20%                   | 15%                                              | 456,363       |       |
| Winter storms                    | 50%                                                         | 30%                   | 40%                                              | 1,216,969     |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                           |                                                             |                       |               |                                                  | FACILITY NAME: (Moore) Walgreen's #3 |             |
|----------------------------------|---------------------------|-------------------------------------------------------------|-----------------------|---------------|--------------------------------------------------|--------------------------------------|-------------|
| FACILITY LOCATION:               |                           | 1041 S W 19, Moore                                          |                       |               | COUNTY:                                          |                                      | Cleveland   |
|                                  |                           | Latitude:                                                   | 35.3202 N             |               | Longitude:                                       |                                      | - 97.5127W  |
| WHY CRITICAL:                    | Emergency Service         | Government                                                  | Health Service        | Utility       | Resource (Grocery, pharmacy, emergency supplies) | Other                                |             |
| ABOUT THE STRUCTURE:             |                           | Vulnerability due to location, age and type of construction |                       |               |                                                  |                                      |             |
| Location:                        | Year built:               | Stories:                                                    | Type of Construction: | Square Feet:  | Vulnerability quotient                           |                                      |             |
|                                  | 2004                      | 1                                                           | Masonry               | 14,709        | 10%                                              |                                      |             |
| SFHA                             | Building value:           |                                                             | \$1,420,852           |               | Contents value:                                  |                                      | \$1,095,387 |
|                                  | Probability of this risk? | Degree of Impact                                            | Percent of loss       | Value of loss | NOTES                                            |                                      |             |
| Dam Failure                      | 10%                       | 30%                                                         | 20%                   | 503,248       |                                                  |                                      |             |
| Drought                          | 60%                       | 10%                                                         | 35%                   | 880,684       |                                                  |                                      |             |
| Earthquake                       | 60%                       | 30%                                                         | 45%                   | 1,132,308     |                                                  |                                      |             |
| Extreme heat                     | 80%                       | 10%                                                         | 45%                   | 1,132,308     |                                                  |                                      |             |
| Flooding                         | 30%                       | 40%                                                         | 35%                   | 880,684       |                                                  |                                      |             |
| Hail                             | 80%                       | 20%                                                         | 50%                   | 1,258,120     |                                                  |                                      |             |
| High winds                       | 50%                       | 20%                                                         | 35%                   | 880,684       |                                                  |                                      |             |
| Lightning                        | 60%                       | 10%                                                         | 35%                   | 880,684       |                                                  |                                      |             |
| Tornado                          | 70%                       | 40%                                                         | 55%                   | 1,383,931     |                                                  |                                      |             |
| Wildfires                        | 10%                       | 20%                                                         | 15%                   | 377,436       |                                                  |                                      |             |
| Winter storms                    | 50%                       | 30%                                                         | 40%                   | 1,006,496     |                                                  |                                      |             |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             |                         |                        | FACILITY NAME: (Moore) Wal-Mart Neighborhood Market |                                                        |
|----------------------------------|-------------------------------------------------------------|-------------------------|------------------------|-----------------------------------------------------|--------------------------------------------------------|
| FACILITY LOCATION:               |                                                             | 640 S E 4th, Moore      |                        | COUNTY: Cleveland                                   |                                                        |
|                                  | Latitude:                                                   | 35.3342 N               |                        | Longitude:                                          | - 97.4959 W                                            |
| WHY CRITICAL:                    | Emergency Service                                           | Government              | Health Service         | Utility                                             | Resource (Grocery, pharmacy, emergency supplies) Other |
| ABOUT THE STRUCTURE:             | Vulnerability due to location, age and type of construction |                         |                        |                                                     |                                                        |
| Location:                        | Year built:                                                 | Stories:                | Type of Construction:  | Square Feet:                                        | Vulnerability quotient                                 |
|                                  | 2000                                                        | 1                       | Masonry                | 40,873                                              | 20%                                                    |
| SFHA                             | Building value:                                             | \$2,183,585             |                        | Contents value:                                     | \$4,238,690                                            |
|                                  | <b>Probability of this risk?</b>                            | <b>Degree of Impact</b> | <b>Percent of loss</b> | <b>Value of loss</b>                                | <b>NOTES</b>                                           |
| Dam Failure                      | 10%                                                         | 30%                     | 20.00%                 | 1,284,455                                           |                                                        |
| Drought                          | 60%                                                         | 10%                     | 35.00%                 | 2,247,796                                           |                                                        |
| Earthquake                       | 60%                                                         | 30%                     | 45.00%                 | 2,890,024                                           |                                                        |
| Extreme heat                     | 80%                                                         | 10%                     | 45.00%                 | 2,890,024                                           |                                                        |
| Flooding                         | 30%                                                         | 40%                     | 35.00%                 | 2,247,796                                           |                                                        |
| Hail                             | 80%                                                         | 20%                     | 50.00%                 | 3,211,138                                           |                                                        |
| High winds                       | 50%                                                         | 20%                     | 35.00%                 | 2,247,796                                           |                                                        |
| Lightning                        | 60%                                                         | 10%                     | 35.00%                 | 2,247,796                                           |                                                        |
| Tornado                          | 70%                                                         | 40%                     | 55.00%                 | 3,532,251                                           |                                                        |
| Wildfires                        | 10%                                                         | 20%                     | 15.00%                 | 963,341                                             |                                                        |
| Winter storms                    | 50%                                                         | 30%                     | 40.00%                 | 2,568,910                                           |                                                        |

Hazard Mitigation Specialists, LLC



| CRITICAL FACILITY IDENTIFICATION      |                             | FACILITY NAME: (Moore) Wal-Mart Neighborhood Market         |                       |                             |                                                  |       |
|---------------------------------------|-----------------------------|-------------------------------------------------------------|-----------------------|-----------------------------|--------------------------------------------------|-------|
| FACILITY LOCATION: 640 S E 4th, Moore |                             | COUNTY: Cleveland                                           |                       |                             |                                                  |       |
| Latitude: 35.3342 N                   |                             | Longitude:                                                  |                       | - 97.4959 W                 |                                                  |       |
| WHY CRITICAL:                         | Emergency Service           | Government                                                  | Health Service        | Utility                     | Resource (Grocery, pharmacy, emergency supplies) | Other |
| ABOUT THE STRUCTURE:                  |                             | Vulnerability due to location, age and type of construction |                       |                             |                                                  |       |
| Location:                             | Year built:                 | Stories:                                                    | Type of Construction: | Square Feet:                | Vulnerability quotient                           |       |
|                                       | 2000                        | 1                                                           | Masonry               | 40,873                      | 20%                                              |       |
| SFHA                                  | Building value: \$2,183,585 |                                                             |                       | Contents value: \$4,238,690 |                                                  |       |
|                                       | Probability of this risk?   | Degree of Impact                                            | Percent of loss       | Value of loss               | NOTES                                            |       |
| Dam Failure                           | 10%                         | 30%                                                         | 20.00%                | 1,284,455                   |                                                  |       |
| Drought                               | 60%                         | 10%                                                         | 35.00%                | 2,247,796                   |                                                  |       |
| Earthquake                            | 60%                         | 30%                                                         | 45.00%                | 2,890,024                   |                                                  |       |
| Extreme heat                          | 80%                         | 10%                                                         | 45.00%                | 2,890,024                   |                                                  |       |
| Flooding                              | 30%                         | 40%                                                         | 35.00%                | 2,247,796                   |                                                  |       |
| Hail                                  | 80%                         | 20%                                                         | 50.00%                | 3,211,138                   |                                                  |       |
| High winds                            | 50%                         | 20%                                                         | 35.00%                | 2,247,796                   |                                                  |       |
| Lightning                             | 60%                         | 10%                                                         | 35.00%                | 2,247,796                   |                                                  |       |
| Tornado                               | 70%                         | 40%                                                         | 55.00%                | 3,532,251                   |                                                  |       |
| Wildfires                             | 10%                         | 20%                                                         | 15.00%                | 963,341                     |                                                  |       |
| Winter storms                         | 50%                         | 30%                                                         | 40.00%                | 2,568,910                   |                                                  |       |

Hazard Mitigation Specialists, LLC

| CRITICAL FACILITY IDENTIFICATION |                                                             | FACILITY NAME:          |                                                  |               |       |
|----------------------------------|-------------------------------------------------------------|-------------------------|--------------------------------------------------|---------------|-------|
| 501 SW 19, Moore                 |                                                             | (Moore) Wal-Mart Stores |                                                  |               |       |
| <b>FACILITY LOCATION:</b>        | 501 SW 19, Moore                                            | <b>COUNTY:</b>          | Cleveland                                        |               |       |
|                                  | Latitude: 35.3224 N                                         | Longitude:              | - 97.4929 W                                      |               |       |
| <b>WHY CRITICAL:</b>             | Emergency Service                                           | Government              | Health Service                                   |               |       |
|                                  |                                                             | Utility                 | Resource (Grocery, pharmacy, emergency supplies) |               |       |
|                                  |                                                             |                         | Other                                            |               |       |
| <b>ABOUT THE STRUCTURE:</b>      | Vulnerability due to location, age and type of construction |                         |                                                  |               |       |
| Location:                        | Year built:                                                 | Stories:                | Type of Construction:                            |               |       |
|                                  | 1995                                                        | 1                       | Masonry                                          |               |       |
|                                  |                                                             |                         | Square Feet:                                     |               |       |
|                                  |                                                             |                         | 924,343                                          |               |       |
|                                  |                                                             |                         | Vulnerability quotient                           |               |       |
|                                  |                                                             |                         | 20%                                              |               |       |
| SFHA                             | Building value:                                             | \$10,714,850            | Contents value:                                  |               |       |
|                                  |                                                             |                         | \$9,203,909                                      |               |       |
|                                  | Probability of this risk?                                   | Degree of Impact        | Percent of loss                                  | Value of loss | NOTES |
| Dam Failure                      | 10%                                                         | 30%                     | 20.00%                                           | 3,983,752     |       |
| Drought                          | 60%                                                         | 10%                     | 35.00%                                           | 6,971,566     |       |
| Earthquake                       | 60%                                                         | 30%                     | 45.00%                                           | 8,963,442     |       |
| Extreme heat                     | 80%                                                         | 10%                     | 45.00%                                           | 8,963,442     |       |
| Flooding                         | 30%                                                         | 40%                     | 35.00%                                           | 6,971,566     |       |
| Hail                             | 80%                                                         | 20%                     | 50.00%                                           | 9,959,380     |       |
| High winds                       | 50%                                                         | 20%                     | 35.00%                                           | 6,971,566     |       |
| Lightning                        | 60%                                                         | 10%                     | 35.00%                                           | 6,971,566     |       |
| Tornado                          | 70%                                                         | 40%                     | 55.00%                                           | 10,955,317    |       |
| Wildfires                        | 10%                                                         | 20%                     | 15.00%                                           | 2,987,814     |       |
| Winter storms                    | 50%                                                         | 30%                     | 40.00%                                           | 7,967,504     |       |

Hazard Mitigation Specialists, LLC