4.13 Fixed Site Hazardous Material Events

Hazardous materials are chemical substances that, if released or misused, can pose a threat to the environment or human health. These chemicals are used in industry, agriculture, medicine, research, and consumer goods. Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These substances are often released because of chemical accidents at plant sites or transportation accidents.

In this Plan, pipelines that may covey hazardous materials are considered as part of the Nation's *transportation network* and are discussed under the topic of Transportation hazards – including above-ground metering and booster facilities, which can sometimes be quite large.

In recent years, the increased usage of chemically dependent products and the introduction of new chemicals, materials and substances into commerce have resulted in a corresponding increase in the number of accidents and spills involving toxic and hazardous materials.

4.13.1 Hazard Profile

Hazardous materials, for regulatory purposes, are divided into two general categories: fixed sites, and transportation facilities.

Fixed sites include buildings or property where hazardous materials are manufactured or stored, and are regulated nationally under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the U.S. Environmental Protection Agency (EPA), and in Oklahoma by the Department of Environmental Quality.

With 43 Tier II sites located within its jurisdiction, Canadian County is vulnerable to hazardous materials events

The federal government has established detailed systems for keeping track of Tier II hazardous materials sites. The *Emergency Planning and Community Right to Know Act* of 1986 defines a Tier II site as any location that has, for any 24-hour period, either 1) specified threshold amounts of defined Extremely Hazardous Substances, or 2) any other substance requiring a Material Safety Data Sheet (MSDS) for amounts greater than 10,000 pounds. In Oklahoma in 2001, there were 28,000 Tier II sites reported to the Oklahoma Department of Environmental Quality. Canadian County accounted for 43 of these sites.

Transportation of hazardous materials is regulated by the U.S. Department of Transportation (DOT), under the *Hazardous Materials Transportation Act*, 49 CFR 119 for natural and other gases transported by pipeline, and 49 CFR 195 for liquids transported by pipeline. For intrastate commerce, the transportation of hazardous materials is regulated by the Oklahoma Corporation Commission.

The responsibility for receiving reports on hazardous materials and toxic waste events was given to the National Response Center (NRC), www.nrc.uscg.mil/nrcback.html, staffed by the U.S. Coast Guard. The NRC serves as the sole national point of contact for reporting all oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United

States or its territories. The NRC also acts as a 24-hour contact point to receive earthquake, flood, hurricane, and evacuation reports.

Many products containing hazardous chemicals are used and stored routinely in residential, commercial, and industrial applications. These products are also shipped daily on the nation's highways, railroads, waterways, and pipelines. In most cases, disasters involving hazardous materials are confined to a localized area, whether an accidental release occurs at a fixed facility or in association with a transportation incident. Transportation related events are addressed in Section 4.15: *Transportation Hazards.*

Gas and oil pipeline spills can be considered as either fixed-site events occurring in an extended industrial plant, or as transportation hazards (see 4.15.1 Hazard Profile, Transportation Hazards). In this Plan pipeline releases are considered under Transportation, but events involving large-scale collection and booster stations are dealt with as fixed-site releases. Between 2000 and 2009, there were 651 natural oil and gas pipeline spills in Oklahoma. Most of the accidents were at the local distribution company level. A major cause of pipeline failure, especially in Oklahoma's aging petroleum industry infrastructure, is corrosion. During the same timeframe, Oklahoma reported 374 spills from oil storage tanks, primarily due to lightning strikes and aging or faulty facilities.

As many as 500,000 products pose physical or health hazards and can be defined as hazardous chemicals. Each year, over 1,000 new synthetic chemicals are introduced. In an average city of 100,000 residents, 23.5 tons of toilet bowl cleaner, 13.5 tons of liquid household cleaners, and 3.5 tons of motor oil are discharged into city drains each month.

The US Environmental Protection Agency sorts hazardous materials into six categories:

1. Toxic Agents (irritants, asphyxiates, narcotics)
2. Other Toxic Agents (hepatoxic, nephratoxic)
3. Hazardous Wastes
4. Hazardous Substances
5. Toxic Pollutants
6. Extremely Hazardous Substance

Hazardous materials affect people through inhalation, ingestion, or direct contact with skin. They can cause death, serious injury, long-lasting health problems, and damage to buildings, homes and other property.

Location

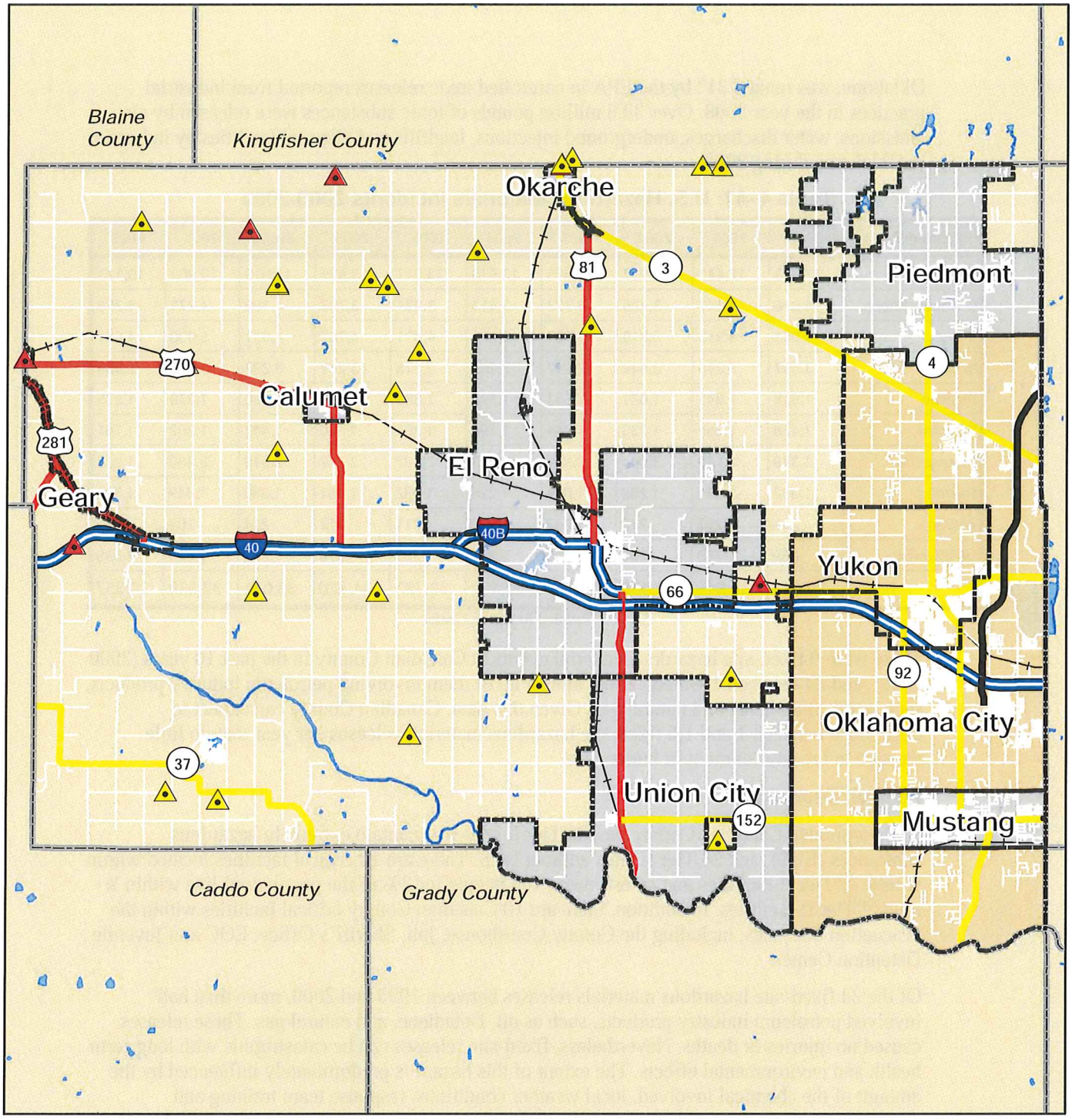
Canadian County, its communities and public school systems have inventoried local businesses and industry to identify dangerous chemicals that are being manufactured and/or stored in their communities. Known hazardous materials sites for Canadian County are shown on the maps in Figure 4–32.

Measurement

Reports on hazardous materials events are submitted by the responsible party to the County LEPC, the Oklahoma Department of Environmental Quality, and the National Response Center. This information is summarized to show community, county and state summaries. This allows the number of hazardous materials events that a community has to be measured against state and national averages.

Frequency

The National Response Center reports that an average of approximately 32,185 hazardous materials events occur each year in the United States. Annually, on average, about 12,000 events are from fixed-site locations, the largest number of any of the defined incident types.



LEGEND

- Interstate
- US Highway
- State Highway
- Turnpike
- Railroads
- City Limits

TierII

- 2009 EHS Tier 2
- 2009 non EHS Tier 2
- Not in Plan

0 2.5 5 Miles

N W E S

CANADIAN COUNTY 1890 OK

Flanagan & Associates, LLC
Planning Consultants

Figure 4-32

Canadian County

Tier II Reporting Sites

Oklahoma was ranked 31st by the EPA in controlled toxic releases reported from industrial practices in the year 2008. Over 33.6 million pounds of toxic substances were released by air emissions, water discharges, underground injections, landfills and disposal facilities by industries in Oklahoma during 2008.

Table 4–41: U.S. Hazardous Materials Incidents 2000-2009

Incident Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fixed	11,813	12,441	11,917	11,975	12,975	13,017	13,621	11,913	10,909	10,123
Unknown Sheen	4,016	4,147	3,426	3,733	3,411	3,934	3,797	4,199	4,278	4,254
Vessel	3,945	4,378	3,919	3,962	4,385	4,611	4,767	4,931	5,030	4,597
Mobile	3,597	3,216	2,942	2,947	3,192	3,215	3,267	3,297	3,238	2,854
Pipeline	1,618	1,841	1,621	1,643	1,574	1,896	1,839	1,580	1,379	1,275
Platform	1,428	1,355	1,233	1,344	1,198	1,395	1,606	1,407	1,362	1,761
Storage Tank	1,379	3,140	3,044	2,808	2,838	2,687	2,577	2,519	2,460	1,973
Railroad	1,332	1,241	1,200	1,074	1,276	1,532	1,451	1,390	1,649	1,306
Aircraft	248	297	278	262	277	211	217	214	204	175
Drill/Exercise	669	789	908	743	1,073	1,223	1,578	1,584	1,829	2,039
TOTAL	30,045	32,845	30,488	30,491	32,199	33,721	34,720	33,034	32,338	30,357

Source: National Response Center

There were 9 fixed-site hazardous material events in Canadian County in the past 10 years (2000-2009), and 24 between 1995 and 2009, almost all of them involving petroleum industry products, such as oil, Butadiene, and natural gas. Given this data, Canadian County can expect to experience between 1 and 1.5 fixed-site hazardous materials releases per year that do little damage to the environment or human life.

Extent/Severity

Unincorporated Canadian County has six Tier II sites that contain extremely hazardous substances (EHS), and 24 Tier II sites without EHS. There are 10 critical facilities located within ¼ mile of Tier II facilities and an estimated 108 people (or 2% of the population) live within ¼ mile of Tier II facilities. In addition, there are 10 Canadian County critical facilities within the evacuation distances, including the County Courthouse, Jail, Sheriff's Office, EOC and Juvenile Detention Center.

Of the 24 fixed-site hazardous materials releases between 1995 and 2009, more than half involved petroleum industry products, such as oil, Butadiene, and natural gas. These releases caused no injuries or deaths. Nevertheless, fixed-site releases can be catastrophic with long-term health and environmental effects. The extent of this hazard is predominately influenced by the amount of the chemical involved, local weather conditions, response team training and equipment, enforcement of community regulations and codes, identification of hazardous material storage sites and pipelines, and advanced warning systems (e.g., warning sirens with voice capability, Reverse 911, etc.)

Canadian County considers a minor severity event to be a chemical spill that is unlikely to cause severe casualties, or which meets the Emergency Response Guidebook definition of a "small spill," and a major severity event to be the release of a toxic chemical which has the likelihood of producing serious injury or death, or which meets the definition of a "large spill" for a particular chemical according to the most current edition of the Emergency Response Guidebook.

Impact

The impact on the community of this hazard can include interrupted business and school operations, disrupted transportation systems, short- or long-term ecological damage or degradation, diminished emergency response, and injury or loss of life.

4.13.2 Historical/Previous Occurrences

Oklahoma Toxic Releases

- **March 26, 1997**- an explosion at Chief Supply Chemical Company, 5 miles northwest of Haskell on U.S. 64, sent up a column of smoke that could be seen for 50 miles. The fire continued to burn through the night of March 28. One employee was critically burned and later died.
- **January 22, 2001**- carbon monoxide was released from a piece of gas equipment owned by Reliant Energy Arkla Gas Company into a Chickasha residence causing two fatalities.

Canadian County Fixed Site Hazardous Material Events

In Canadian County, the majority of hazardous materials events are due to the production and or transportation of hydrocarbons, or their use in manufacturing processes. There were 9 fixed site hazardous material events in Canadian County in the period from 2000 to 2010, and 21 from 1995 to 2009. Almost half (11) occurred at the Xerox facility at 100 N. Mustang Rd., in Yukon, and involved the release of Butadiene. These are summarized in the following table.

Table 4–42: Canadian County Fixed Site Hazardous Materials Events

Date	Incident	Location	Responsible Party	Nearest City	Medium Affected	Released Material
05/23/11	Tornado strikes NG pipeline facility	I-40 & Calumet Rd.	Nature	Calumet	Air	Natural gas
01/06/11	Reactor releases Butadiene and Styrene	100 N. Mustang Rd.	Xerox	Yukon	Air	Butadiene, Styrene
04/12/10	Mining dust stirred up by trucks on site	OK Hwy 66 & Gregory Rd.	Canadian CPI Pipe	Yukon	Air	Mining dust
02/12/08	Butadiene released from vent stack	100 N. Mustang Rd.	Xerox	Yukon	Air	Butadiene
12/06/07	Release of drilling mud	10 W. Karns Rd.	Devon Energy	Calumet	Water	Oil drilling mud
05/09/07	Tornado damaged transformer	2300 Holloway Ave.	OGE	El Reno	Water	Polychlorinated Biphenyls
07/28/05	Release of Butadiene from resin reactor	100 N. Mustang Rd.	Xerox	Yukon	Air	Butadiene
12/10/01	Dumping of caustic soda, lime and sulfa	320 Piedmont Rd. N.	R B Pet Products	Piedmont	Land	Sulfur
06/26/01	House explosion	704 S. Mayhan	Unknown	El Reno	Air	Natural gas
03/19/01	Glycol unit caught fire	Yukon	Duke Energy	Yukon	Air	Glycol
11/13/00	Reactor contents emptied into pit	100 N. Mustang Rd.	Xerox	Yukon	Air	Butadiene
09/19/99	Pit shop vault problem releases Butadiene	100 N. Mustang Rd.	Xerox	Yukon	Air	Butadiene
04/02/99	Hazmat waste tank overflows	100 N. Mustang Rd.	Xerox	Yukon	Air	Volatile compound
12/10/98	Release from resin plant	100 N. Mustang Rd.	Xerox	Yukon	Air	Butadiene
11/20/98	Release from resin plant	100 N. Mustang Rd.	Xerox	Yukon	Air	Butadiene
10/31/98	Resin plant reactor catastrophic seal failure	100 N. Mustang Rd.	Xerox	Yukon	Air	Butadiene
09/19/98	Dumping refrigerants	12825 SW 58th	Allied Refrigeration	Mustang	Air	Refrigerants
08/16/98	Dumping paint thinners on ground	13448 Lake Shore Dr.	Resident	Piedmont	Land	Paint, thinners

Date	Incident	Location	Responsible Party	Nearest City	Medium Affected	Released Material
05/20/97	Compressor leak	10 mi. N of El Reno	Delhi Gas Pipeline	El Reno	Land	Oil, lubricant
11/20/97	Pump seal failure on tank	100 N. Mustang Rd.	Xerox	Yukon	Air	Butadiene
02/08/97	Resin plant over-pressurization	100 N. Mustang Rd.	Xerox	Yukon	Air	Butadiene
04/22/96	Oil tank struck by lightning causing fire	11200 NW 10th St.	Kerr-McGee	Yukon	Water	Crude oil
11/19/95	Oil from well leaked into stream			Union City		Crude oil
06/08/95	Drums of oil found in creek	3606 E. Elm St.	Unknown		Water	Methanol

Almost all of Canadian County's fixed-site hazmat incidents are connected with spills of petroleum products of some sort—either from production facilities or from manufacturing plants that use hydrocarbon products, like Butadiene. Generally, the spills are not large, and have limited ecological impact. Additional information about the potential impacts of hazardous materials sites in Canadian County communities and public schools is included in Appendices F and G.

Probability/Future Events

Canadian County is vulnerable to hazardous materials incidents, and therefore its vulnerability is a constant and widespread threat. Hazardous materials incidents can, and do occur in nearly all months of the year at all hours of the day, so it is important that even when not responding to an incident, education and preparations continue to move forward.

Canadian County, its Communities and Public School systems have a moderate probability of a fixed-site hazardous materials event unless otherwise specified in Appendix F or Appendix G.

4.13.3 Vulnerability

This section summarizes information about Canadian County's vulnerability to fixed-site hazardous materials events, including the impact on people, structures and buildings, critical facilities, and infrastructure. This information, as well as information provided by the County, Incorporated Communities and Public Schools, was used to determine the Vulnerability Criteria identified in Tables 4-2 and 4-3. Canadian County was determined to be at moderate risk to the Fixed Site Hazardous Materials hazard. (See Table 4-2 Hazard Risk Analysis, and Table 4-3, Summary of Hazard risk Analysis Ranking Criteria for an explanation of how the rankings were derived.) Appendices F and G identify where the incorporated communities and public school s differ from Canadian County.

A hazardous material event can occur anywhere due to the widespread use of hazardous chemicals. However, the population at most risk to a fixed-site incident is the population that works or lives nearest to the machinery, refineries, or manufacturing plants that use or produce the hazardous materials. Tier II sites within Canadian County area have been identified and are shown on the map in Figure 4–32 and listed in Table 4-43.

Assessment of vulnerability to a hazardous material release can be meticulous due to the relationship that exists between the toxicity of the substance, the amount of material released, the type of spill, and the climatic conditions present at the time of the release. However, for the purposes of this report, general community risk is assessed based on the protective action distances defined by CAMEO and RMP* Comp, two software programs used to plan for hazardous material emergencies. The worst-case protective action distances are based on the physical characteristics of the material and the specified amount of material housed within the largest container at each Tier II site. For chemicals that did not have definable protective action

distances, evacuation distances for large spills as listed in the Emergency Response Guide were used. The protective action distances and large spill evacuations are depicted in the following tables.

Table 4–43: Canadian County Tier II Sites

Facility	Address	*Contains EHS?*	*Population Within ¼ mile*
AT&T Communications – OK3180	I-40 & Methodist Rd., S of Geary	Y	60
Banner Coop Elevator Assocation	4175 N. Banner Rd.	Y	6
Carnott Propane	1301 Sunset Dr., El Reno	N	3
DCP Midstream – Concho Booster	4 mi W & 1 mi N of Concho	N	3
DCP Midstream – East Union City Booster	Smith Rd., 0.5 mi E of Courtney Rd.	N	6
DCP Midstream – Pacific Booster	7 mi W & 3 mi S of Yukon	N	0
DCP Midstream – Petree Booster	0.4 mi E of SW 29th & Heaston Rd.	N	0
DCP Midstream – Phillips Booster	3 mi W and 3 mi S of Okarche	N	0
DCP Midstream – Reform Booster	206th St. NW and N. Chiles Rd.	N	0
DCP Midstream – Reno Booster	6.5 mi E & 1 mi S of Okarche	N	0
Enogex Gas Gathering – Calumet Area Yard	3 mi S of Calumet	N	0
Enogex Gas Gathering – Grandview Compressor Station	4 mi E & 4 mi N of Geary	N	3
Enogex Gas Gathering – Maple Compressor Station	6 mi S and 3 mi W of Calumet	N	0
Enogex Gas Gathering – Six Mile Compressor Station	N. Ranch Rd. & Darlington Rd. NW	N	0
Enogex Products – Calumet Gas Processing Plant	7 mi NW of Calumet	N	0
OFS – El Reno Plant	164th and Highway 81	N	3
OGT West Region – Canadian Co.	59th and Walbaum	N	0
Shawnee Milling, Okarche Gain and Feed	Calumet Rd. and County Line Rd.		
Okarche Water Plant	220th St. NW & N. Maple Rd.	Y	6
Plains Marketing L.P. – El Reno Truck Station	3 mi W and 4.75 mi N of Union City	N	0
Plains Marketing L.P. – Piedmont Truck Station	5.5 mi E of Okarche	N	3
Plains Pipeline – Calumet Pipeline Station	7.5 mi W of Calumet on US Hwy 270	N	6
Plains Pipeline – Concho Pipeline Station	Memorial Rd. NW & N. Heaston Rd.	N	0
Plains Pipeline – Concho Satellite Station	N. Heaston Rd. & Memorial Rd. NW	N	3
Shawnee Milling – Okarche Grain & Feed	Calumet Rd. & County Line Rd.	Y	3
Superior Pipeline – Niles Compressor	SW of Niles	N	3
Watonga Butane - Okarche		N	60

Population

Since approximately 75-80% of all hazardous materials releases occur at fixed-site facilities, the greatest danger is to the populations working at or living near the facilities where the material is released. In unincorporated Canadian County, 108 people (or 2% of the population) live within the evacuation area of a Tier II site.

People at heightened risk in the release area are those with mobility or severe health issues that would limit their ability to evacuate quickly, and people who speak a language other than English, limiting their ability to receive warning messages. In all cases, the population most at risk, other than employees at the facility where the spill occurs, will be those living, working, or attending school close by and downwind from the release.

Critical Facilities

There are 10 critical facilities within the evacuation distances of Canadian County EHS and non-EHS Tier II sites. These are listed in Table 4-44. (See Appendices F and G for community- and school-specific information regarding vulnerability to fixed-site Hazardous Material releases.)

Table 4–44: County Critical Facilities Potentially Vulnerable to Fixed-Site Hazardous Material Events

ID	Name	Address
	Canadian Co. Assessor	200 N. Choctaw Ave.
	Canadian Co. Courthouse	301 N. Choctaw Ave.
	Canadian Co. DHS	7901 E. Hwy 66
	Canadian Co. Election Board	200 S. Bickford Ave.
	Canadian Co. Jail – Historic	300 N. Evans Ave.
	Canadian Co. Jail – Current	208 W. Rogers
	Canadian Co. Judicial Building	301 N. Choctaw Ave.
	Canadian Co. Sheriff	208 W. Rogers
	Canadian Co. District 2 Shop	2305 S. Evans Rd.
	Juvenile Detention Center	314 W. Rogers

Structures/Buildings

Structures and buildings (including Canadian County school facilities) are, as a rule, not vulnerable to hazardous material spills, except in the case of flammable and explosive materials, like natural gas and some petroleum products. No Canadian County critical facilities are located close to facilities utilizing or transporting flammable or explosive materials.

Infrastructure

Water Treatment – Water treatment plants use large amounts of liquid chlorine for purifying drinking water. A liquid chlorine spill at a water treatment plant could force the evacuation of the facility and a temporary stop of operations.

Wastewater Treatment – Wastewater treatment plants not only process contaminated waste, but also use hazardous chemicals. A hazardous substance spill at a plant could force the shutdown of the facility. In addition, a malfunction at the plant could cause the spill of contaminated wastes into rivers and streams.

Utilities: The primary utility providers for Canadian County are Oklahoma Gas & Electric (OG&E) (electricity) and Oklahoma Natural Gas (ONG) (natural gas).

Electricity – There are no immediate vulnerabilities to the supply of electricity because of a hazardous materials spill. Although electrical substations are by their very nature hazardous and contain hazardous materials, such as acids, these do not pose a danger to local citizens, as substations are usually fenced.

Gas – No significant vulnerabilities in the delivery of natural gas supply during a fixed-site event. Natural gas is, itself, a hazardous material, and leaks from ruptured pipes could result in the temporary shut off of gas delivery through the affected lines.

Transportation Systems (Highways, Public Transportation, Railway, Airports) – Evacuation of contaminated areas can clog roadways or block traffic until the event has dissipated.

Emergency Services- Fire, Police and Medical Services could be impacted by having to evacuate facilities. Fire, Police and Medical Services would have a surge of demand for services. While not an immediate threat to delivery of these services, the demand for additional personnel to affect an effective response could potentially increase the cost for these resources.

4.13.4 Fixed-Site Event Scenario

Refer to Appendices F and G for fixed-site event scenarios for individual communities and schools in unincorporated Canadian County.

4.13.5 Future Trends

For information on future development areas in Canadian County, see Section 1.2.8.

Population

Development in Canadian County will continue to expose the population to fixed-site hazardous material spills.

Structures/Buildings

Structures and buildings will remain vulnerable to releases of flammable and explosive materials, like natural gas and some petroleum products. No developments are planned near facilities utilizing or transporting flammable and explosive materials.

Critical Facilities

There are no plans to site critical facilities in close proximity to hazardous materials sites.

Infrastructure

Infrastructure vulnerabilities to hazardous materials will continue to exist. Care should be given in future planning to ensure that both infrastructure and workers are not exposed to hazardous materials releases.

4.13.6 Conclusion

The majority of Canadian County's Tier II sites and hazardous material events are related to the extraction, storage and processing of hydrocarbons. There were 9 fixed-site hazardous material events in Canadian County in the past 10 years (2000-2009), and 24 between 1995 and 2009 almost all of which involved petroleum industry products, such as oil, Butadiene, and natural gas—a frequency of about 1.5 events per year. This history, coupled with a large number of reporting sites, gives Canadian County a Moderate risk of a fixed site hazardous material event.

Update Changes

Identified significant changes made from previous Multi-Hazard Mitigation Plans from Canadian County, Calumet, El Reno, Mustang, Piedmont, and Union City are outlined in Appendix E. Changes are based on criteria outlined for Plan Updates in the Local Multi-Hazard Mitigation Planning Guidance document of July 1, 2008.

4.13.7 Sources

Emergency Response Guidebook 2004, at Web address: http://hazmat.dot.gov/pubs/erg/erg2004.pdf. U.S. Department of Transportation, 2004.

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What is the Toxics Release Inventory Program, at Web address: http://www.epa.gov/tri/whatis.htm. U.S. Environmental Protection Agency, 2002.