

Section 14. Energy Pipeline Failures

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Why Pipeline Failures Are a Threat

An estimated 2.2 million miles of pipelines in the United States carry hazardous materials such as oil and natural gas. Pipelines are out of sight and unnoticed, yet have caused fires and explosions that have killed more than 200 people and injured more than 1,000 people nationwide in the last decade.¹



Pipelines going through the Guadalupe River Basin carry crude oil, natural gas, and hazardous liquids such as

Destruction in Abilene: When a spark from her attic fan ignited a gas cloud from a punctured pipeline, Rita Franssen's house was reduced to a pile of rubble. Franssen escaped by plunging into her pool seconds before the explosion.
(Photos by Taylor Johnson, Austin American-Statesman.)

¹ Jeff Nesmith and Ralph K.M. Haurwitz, July 22, 2001, *Austin American-Statesman*



gasoline, jet fuel, diesel fuel, and liquefied petroleum gas. Pipelines traverse the watersheds that supply water to basin residents, including those that supply water to well-dependent residents and environmentally sensitive areas. A leak or spill from these pipelines could threaten neighborhoods, contaminate water supplies or pollute environmentally sensitive land. And, the Nation's network of natural gas and fuel pipelines is aging.

Hazard Profile

An energy pipeline failure could have a major impact, causing injuries that result in death or permanent disability, completely shutting down critical facilities for at least two weeks, and causing more than twenty-five percent of affected properties to be destroyed or suffer major damage.

Energy pipeline failures are occasional events, with an event possible in the next five years. Energy pipeline failures are not subject to seasonal patterns; an event can occur at any time of year. Warning time for pipeline accidents is minimal or none.

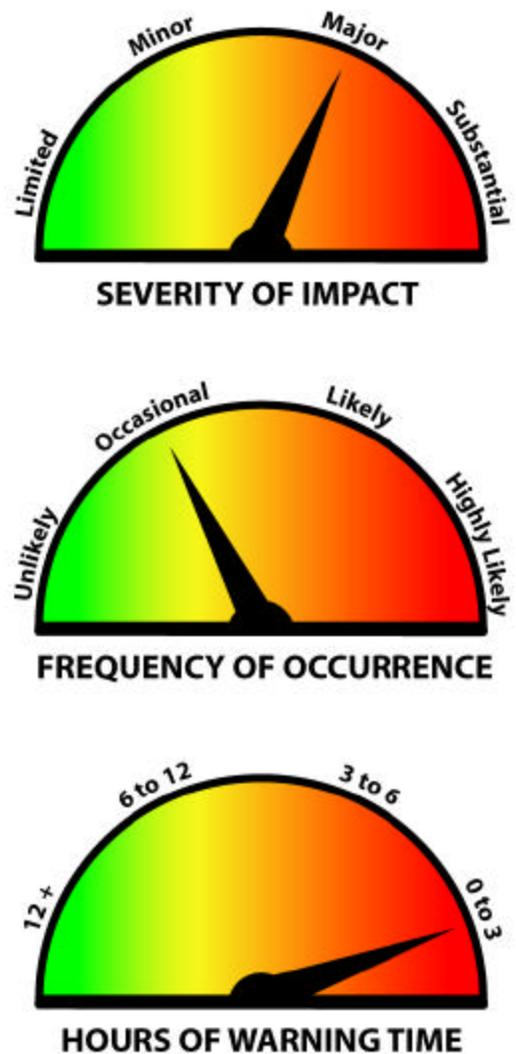
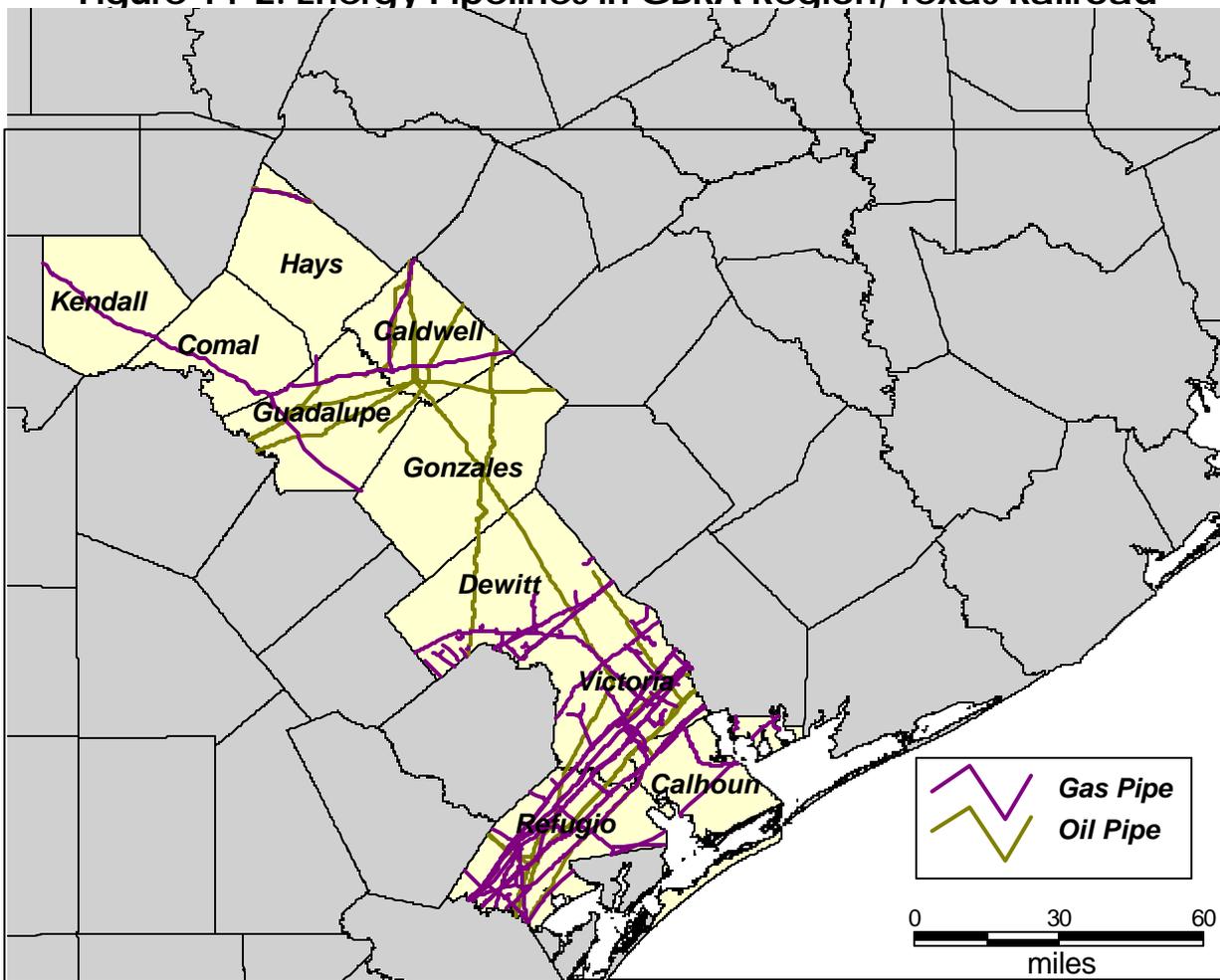


Figure 14- 1. Pipeline Hazard Profile Summary

Location of Hazardous Areas

Figure 14-2 shows the locations of energy pipelines greater than 20 inches in diameter in GBRA region according to the Texas State Railroad Commission. Close to 3,568 miles of pipelines cross this area. If any of these energy pipelines, oil or gas, were to rupture, such an event could endanger property and lives in the immediate area (probably within less than half a mile radius).

Figure 14-2. Energy Pipelines in GBRA Region, Texas Railroad



History of Energy Pipeline Failures

A total of 133 accidents from energy pipeline failures have occurred in the Guadalupe River Basin between 1968 and 2002.² Of these, 22 were in the Upper Basin, 24 were in the Middle Basin, and 87 accidents were in the Lower Basin. Table 14-1 details these incidents and the resulting deaths, injuries, and property damage.

Table 14-1. Pipeline Distribution and Transmission Incident Data (DOT-Reportable) 1969-2002

County	City	Incident Date	Operator	Death	Injury	\$ Operator Property Damage	Pipeline Commodity
Caldwell	Luling	1968	Sinclair Pipeline Co	0	0	200	Gasoline
Caldwell		1969	Texas – New Mexico Pipeline Co	0	0	121	Crude Oil
Caldwell		1970	ARCO Pipeline Co	0	0	100	Gasoline
Caldwell	Luling	1970 0430	Arkansas Louisiana Gas Co	0	0	236	Natural Gas Distribution
Caldwell	Luling	1972	Mobil Pipeline Co	0	0	50	Crude Oil
Caldwell		1972	Texas – New Mexico Pipeline Co	0	0	1,050	Crude Oil
Caldwell	Lockhart	1973 1030	Arkansas Louisiana Gas Co	0	0	150	Natural Gas Distribution

² Source: Office of Pipeline Safety, U.S. Department of Transportation.



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County	City	Incident Date	Operator	Death	Injury	\$ Operator Property Damage	Pipeline Commodity
Caldwell	Luling	1976 0124	Arkansas Louisiana Gas Co	0	1	200	Natural Gas Distribution
Caldwell	Lockhart	1979 1209	Arkansas Louisiana Gas Co	0	0	840	Natural Gas Distribution
Caldwell	Luling	1981	Mobil Pipeline Co	0	0	2,500	Crude Oil
Caldwell	Luling	1982	Texas – New Mexico Pipeline Co	0	0	50	Crude Oil
Caldwell	Prairie Lea	1985 0626	Intratex Gas Co Operator for Oasis Pipe Co	0	0	5,000	Natural Gas Distribution
Caldwell	Luling	1986 0130	Mobil Pipeline Co	0	0	0	Crude Oil
Caldwell		1991 1003	Mobil Pipeline Co	0	0	45,000	Crude Oil
Caldwell	Luling	1999 0507	Citgo Products Pipeline Co	0	0	250,000	Gasoline
Calhoun		1980 0226	Entex Inc	0	3	0	Natural Gas Distribution
Comal		1975 1018	LoVaca Gathering Co	0	0	76,000	Natural Gas Distribution
Comal		1977 1030	LoVaca Gathering Co	0	0	6,500	Natural Gas Distribution
Comal	Fischer	1977	Exxon Pipeline Co	0	0	0	Crude Oil
Comal	New Braunfels	2001 0519	Entex, A Noram Energy Co	0	1	0	Natural Gas Distribution
DeWitt	Nordheim	1978 0802	Shell Oil Co	0	1	0	Natural Gas Distribution



County	City	Incident Date	Operator	Death	Injury	\$ Operator Property Damage	Pipeline Commodity
DeWitt		1979 1031	LoVaca Gathering Co	0	0	55,290	Natural Gas Distribution
DeWitt	Cuero	1981 0527	Tx Eastern Gas Pipeline Co	0	0	16,670	Natural Gas Distribution
DeWitt		1984 0530	Valero Transmission Co	0	0	129,000	Natural Gas Distribution
Gonzales	Gonzales	1982 0301	Arkansas Louisiana Gas Co	0	0	3,000	Natural Gas Distribution
Gonzales	Gonzales	1982 0728	Arkansas Louisiana Gas Co	0	0	218	Natural Gas Distribution
Gonzales		1993 0518	ARCO Pipeline Co	0	0	65,000	Gasoline
Gonzales		1993 0520	ARCO Pipeline Co	0	0	65,000	Gasoline
Gonzales		1998 1125	KOCH Pipeline Co, L.P.	0	0	25,000	Crude Oil
Guadalupe		1968	Texas Pipeline Co	0	0	0	Gasoline
Guadalupe	Kingsbury	1972	Humble Pipeline Co	0	0	175	Crude Oil
Guadalupe		1974 0713	LoVaca Gathering Co	0	0	8,000	Natural Gas Distribution
Guadalupe		1976	Texas - New Mexico Pipeline Co	0	0	1,600	Crude Oil
Guadalupe	Ambrose	1977 0821	Lone Star Gas Co	0	0	3,550	Natural Gas Distribution
Guadalupe	Schertz	1979 0712	Entex Inc	0	0	50	Natural Gas Distribution



County	City	Incident Date	Operator	Death	Injury	\$ Operator Property Damage	Pipeline Commodity
Guadalupe		1980	Texas – New Mexico Pipeline Co	0	0	300	Crude Oil
Guadalupe		1988 0615	ARCO Pipeline Co	0	0	6,520	Gasoline
Guadalupe	Gonzales	1992 0610	ARCO Pipeline Co	0	0	180,000	Gasoline
Guadalupe	FM 3353 and CR 199	1993 0804	Intratex Gas Co	0	0	614,334	Natural Gas Distribution
Guadalupe	Geronimo	1998 0802	Oasis Pipeline Co	0	0	347,361	Natural Gas Distribution
Hays		1973	Phillips Pipeline Co	0	0	35	Natural Gas Liquid
Hays		1976 1106	LoVaca Gathering Co	0	0	1,000	Natural Gas Distribution
Hays	San Marcos	1977 0120	LoVaca Gathering Co	0	0	3,000	Natural Gas Distribution
Hays	San Marcos	1977 0211	Entex Inc	0	1	28,000	Natural Gas Distribution
Hays		1978	Texas – New Mexico Pipeline Co	0	0	5,500	Crude Oil
Hays		1981 0426	Valero Transmission Co	0	0	1,500	Natural Gas Distribution
Kendall		1975 1104	Lone Star Gas Co	0	0	100	Natural Gas Distribution
Refugio		1968	Humble Pipeline Co	0	0	2,040	Crude Oil
Refugio		1971	Humble Pipeline Co	0	0	3,300	Crude Oil
Refugio		1971 0607	Seadrift Pipeline Corp	0	0	0	Natural Gas Distribution



County	City	Incident Date	Operator	Death	Injury	\$ Operator Property Damage	Pipeline Commodity
Refugio	Refugio	1972 0111	United Gas Pipeline Co	0	0	250	Natural Gas Distribution
Refugio		1973	ARCO Pipeline Co	0	0	70	Gasoline
Refugio		1973 0811	United Gas Pipeline Co	0	0	3,544	Natural Gas Distribution
Refugio		1974	Sun Pipeline Co	0	0	640	Crude Oil
Refugio	Refugio	1974	American Petrofina Pipeline Co	0	0	0	Crude Oil
Refugio		1974 0524	United Gas Pipeline Co	0	0	5,700	Natural Gas Distribution
Refugio		1975	Sun Pipeline Co	0	0	5,083	Crude Oil
Refugio		1975	ARCO Pipeline Co	0	0	150	Fuel Oil
Refugio	Woodsboro	1976 0906	United Gas Pipeline Co	0	0	2,575	Natural Gas Distribution
Refugio		1977	Sun Pipeline Co	0	0	3,500	Crude Oil
Refugio		1978	American Petrofina Pipeline Co	0	0	1,306	Crude Oil
Refugio	Refugio	1978	Sun Pipeline Co	0	0	300	Crude Oil
Refugio	Refugio	1979	Exxon Pipeline Co	0	0	2,350	Crude Oil
Refugio		1980	American Petrofina Pipeline Co	0	0	350	Crude Oil
Refugio	Refugio	1980	American Petrofina Pipeline Co	0	0	2,870	Crude Oil
Refugio	Refugio	1983 1210	Natural Gas Pipeline Co of America	0	0	8,000	Natural Gas Distribution
Refugio	Refugio	1988 0904	Florida gas Transmission Co	0	0	50,000	Natural Gas Distribution



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County	City	Incident Date	Operator	Death	Injury	\$ Operator Property Damage	Pipeline Commodity
Refugio	Tivoli	1990 1124	Florida Gas Transmission Co	0	0	150,000	Natural Gas Distribution
Refugio		1991 1030	Exxon Pipeline Co	0	0	300,000	Crude Oil
Refugio	Refugio	1992 0225	Coastal States Crude Gathering Co	0	0	5,000	L.P.G.
Refugio	Refugio	1993 0210	United Gas Pipeline Co	0	0	55,000	Natural Gas Distribution
Refugio		1994 0304	Exxon Pipeline Co	0	0	8,000	
Refugio		1996 1224	KOCH Pipeline Co, LP	0	0	5,000	Crude Oil
Refugio		1997 0512	KOCH Pipeline Co, LP	0	0	50,000	Crude Oil
Refugio	Refugio	2001 0820	Kinder Morgan Texas Pipeline Co	0	0	16,680	Natural Gas Distribution
Victoria		1970 0508	Transcontinental Gas Pipeline Corp	0	0	0	Natural Gas Distribution
Victoria		1970	ARCO Pipeline Co	0	0	250	Kerosene
Victoria		1971	Sun Pipeline Co	0	0	554	Crude Oil
Victoria	Victoria	1971 0731	Houston Natural Gas Corp	0	0	100	Natural Gas Distribution
Victoria	Victoria	1971 0903	Tennessee Gas Pipeline Co	0	0	0	Natural Gas Distribution
Victoria	Victoria	1971 0904	Tennessee Gas Pipeline Co	0	0	0	Natural Gas Distribution
Victoria		1972	Sun Pipeline Co	0	0	200	Crude Oil
Victoria		1972	Sun Pipeline Co	0	0	0	Crude Oil
Victoria		1972	Sun Pipeline Co	0	0	150	Crude Oil
Victoria		1972	Sun Pipeline Co	0	0	1,000	Crude Oil



County	City	Incident Date	Operator	Death	Injury	\$ Operator Property Damage	Pipeline Commodity
Victoria		1972	Sun Pipeline Co	0	0	0	Crude Oil
Victoria	Plains	1972	Sun Pipeline Co	0	0	0	Crude Oil
Victoria	Placedo	1972 0307	United Gas Pipeline Co	0	0	25	Natural Gas Distribution
Victoria		1972 0419	Humble Pipeline Co	0	0	100	Natural Gas Distribution
Victoria		1972 1018	Lone Star Gas Co	0	0	932	Natural Gas Distribution
Victoria		1972 1127	Lone Star Gas Co	0	0	337	Natural Gas Distribution
Victoria		1973	Sun Pipeline Co	0	0	100	Crude Oil
Victoria	Victoria	1973 0117	Delhi Gas Pipeline Corp	0	0	500	Natural Gas Distribution
Victoria		1973 0207	Delhi Gas Pipeline Corp	0	0	500	Natural Gas Distribution
Victoria	Bloomington	1973 0520	Lone Star Gas Co	0	0	2,600	Natural Gas Distribution
Victoria		1974	Sun Pipeline Co	0	0	225	Crude Oil
Victoria	Victoria	1974	Sun Pipeline Co	0	0	200	Crude Oil Distribution
Victoria	Victoria	1974	Sun Pipeline Co	0	0	246	Crude Oil
Victoria	Bloomington	1974 0204	Lone Star Gas Co	0	0	565	Natural Gas Distribution
Victoria		1974 0214	Delhi Gas Pipeline Corp	0	0	4,000	Natural Gas Distribution
Victoria	Victoria	1975	Sun Pipeline Co	0	0	807	Crude Oil
Victoria	Bloomington	1975 0519	Lone Star Gas Co	0	0	750	Natural Gas Distribution
Victoria	Bloomington	1975 0702	Lone Star Gas Co	0	0	700	Natural Gas Distribution
Victoria		1975 0708	Lone Star Gas Co	0	0	2,500	Natural Gas Distribution
Victoria	Bloomington	1976 0122	Lone Star Gas Co	0	0	750	Natural Gas Distribution



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County	City	Incident Date	Operator	Death	Injury	\$ Operator Property Damage	Pipeline Commodity
Victoria	Bloomington	1976 0812	Lone Star Gas Co	0	0	600	Natural Gas Distribution
Victoria		1976 1227	Lone Star Gas Co	0	0	750	Natural Gas Distribution
Victoria	Victoria	1977	Sun Pipeline Co	0	0	525	Crude Oil
Victoria		1977 0102	LoVaca Gathering Co	0	0	250,000	Natural Gas Distribution
Victoria	Victoria	1977 0517	Lone Star Gas Co	0	0	1,500	Natural Gas Distribution
Victoria	Victoria	1977 1231	Delhi Gas Pipeline Corp	0	0	0	Natural Gas Distribution
Victoria	Victoria	1978	Sun Pipeline Co	0	0	200	Crude Oil
Victoria	Placedo	1978	Sun Pipeline Co	0	0	300	Crude Oil
Victoria	Victoria	1978 0406	Delhi Gas Pipeline Corp	0	0	0	Natural Gas Distribution
Victoria	Victoria	1978 0926	Tennessee Gas Pipeline Co	0	0	2,000	Natural Gas Distribution
Victoria	Victoria	1979	Sun Pipeline Co	0	0	550	Crude Oil
Victoria	Bloomington	1979	Sun Pipeline Co	0	0	850	Crude Oil
Victoria		1979 1114	LoVaca Gathering Co	0	1	4,996	Natural Gas Distribution
Victoria	Victoria	1981 0909	Delhi Gas Pipeline Corp	0	0	0	Natural Gas Distribution
Victoria	Victoria	1981 0909	Delhi Gas Pipeline Corp.	0	0	0	Natural Gas Distribution
Victoria	Victoria	1982 0303	Delhi Gas Pipeline Corp	0	0	0	Natural Gas Distribution
Victoria	Placedo	1983 0906	Lone Star Gas Co	0	0	6,800	Natural Gas Distribution
Victoria		1983 0913	Transco Gas Pipeline Corp	0	0	0	Natural Gas Distribution
Victoria	Dacosta	1983 1122	United Gas Pipeline Co	0	0	1,086	Natural Gas Distribution
Victoria	Dernal	1984 0126	Tennessee Gas Pipeline Co	0	0	2,000	Natural Gas Distribution



County	City	Incident Date	Operator	Death	Injury	\$ Operator Property Damage	Pipeline Commodity
Victoria	Dernal	1984 0130	Tennessee Gas Pipeline Co	0	0	2,000	Natural Gas Distribution
Victoria	Dernal	1984 0131	Tennessee Gas Pipeline Co	0	0	2,000	Natural Gas Distribution
Victoria	Victoria	1989 0302	Delhi Gas Pipeline Corp	0	0	24,000	Natural Gas Distribution
Victoria	Victoria	1989 0317	Houston Pipeline Co	0	0	25,000	Natural Gas Distribution
Victoria		1992 0619	ARCO Pipeline Co	0	0	442,500	Gasoline
Victoria		1993 0619	Coastal States Crude Gathering Co	0	0	20,000	L.P.G.
Victoria	Inez	1994 0407	Gulf Coast Natural Gas Co	0	0	66,278	Natural Gas Distribution
Victoria		1998 0714	Coastal States Crude Gathering Co	1	0	50,000	Natural Gas Liquid

Source: Office of Pipeline Safety, U.S. Department of Transportation.



People and Property at Risk

Approximately 35,122 people in the Guadalupe River Basin live within a one-mile radius of an oil or gas pipeline with a diameter equal to or greater than 20 inches. Over \$ 3 billion in residential and commercial property is located within the one-mile radius of a pipeline with a diameter equal to or greater than 20 inches. Tables 14-2a and 14-2b show the people and buildings at risk and the value of exposure for oil and gas pipelines, respectively.

**Table 14-2a. Risk Due to Oil Pipeline Rupture
(Pipeline diameter equal to or greater than 20 inches)**

Jurisdiction	Potential Residential Buildings at Risk		Potential Commercial Buildings at Risk		Potential People at Risk
	Number	Value (\$Thousands)	Number	Value (\$Thousands)	
Caldwell	999	140,170	4	9,256	3,663
Calhoun	9	1,326	0	0	5
Comal	-	-	-	-	-
DeWitt	117	15,967	2	3,969	244
Gonzales	267	31,897	8	14,341	643
Guadalupe	2,364	333,635	23	34,993	5,288
Hays	426	72,992	7	14,436	537
Kendall	-	-	-	-	-
Refugio	238	30,851	1	2,164	490
Victoria	2,659	484,919	24	75,023	5,873
TOTALS	7,079	\$1,111,758	69	\$154,182	16,743

**Table 14-2b. Risk Due to Gas Pipeline Rupture
(Pipeline diameter equal to or greater than 20 inches)**

Jurisdiction	Potential Residential Buildings at Risk		Potential Commercial Buildings at Risk		Potential People at Risk
	Number	Value (\$Thousands)	Number	Value (\$Thousands)	
Caldwell	417	46,271	1	891	1,020
Calhoun	496	70,677	7	10,027	919



Comal	940	147,265	5	8,557	1,606
DeWitt	394	53,130	1	1,918	788
Gonzales ³	-	-	-	-	-
Guadalupe	1,062	149,082	39	70,636	2,097
Hays	409	70,246	7	15,673	509
Kendall	338	56,217	0	653	526
Refugio	419	58,281	3	4,597	904
Victoria	5,026	891,726	37	82,181	10,010
TOTAL	9,500	\$1,542,895	99	\$195,132	18,379

¹ "At risk" is defined as being located within a one-mile radius surrounding a pipeline with a diameter of equal to or greater than 20 inches.

Potential Damages and Losses

Potential dollar loss estimates for energy pipeline failures are not available. However, the historic average occurrence of pipeline failures in the Basin serves as the best predictor of future expected recurrence.

GBRA facilities (described on pages 4-18 and 4-19) are also at risk from this hazard. However, no estimate is currently available of potential damages and losses to those facilities.

³ According to the Chief Building Official, Gonzales County, a 6-inch gas pipeline traverses the county from northwest to southeast, operated by the Texas Gas Company. The county estimates that 64 buildings, four businesses, and 135 people are located within a one-mile radius surrounding the pipeline. Residential property at risk is estimated at \$10,767,000. Commercial property at risk is estimated at \$7,646,000.