

Part I:

Pipeline Bursts:

Their *Causations*,

and the

Deaths, Bodily Injuries,

& Economic *and* Ecological Damages

they Inflicted

2009 – 2010

As recorded by the U.S. Department of Transportation's
Pipeline & Hazardous Materials Safety Administration

(www.phmsa.dot.gov/staticfiles/PHMSA/PipelineFailureReports)

Other sources cited, where applicable.

Compiled by Distance Everheart & Naomi Langley of Wild Willpower PAC

(www.WildWillpower.org)

2009

- On January 4, 2009, a 6.625-inch storage well line operated by Columbia Gas Transmission Company¹ in Elk View (*near Charleston*), Kanawha County, West Virginia, **ruptured due to internal corrosion pitting complicated by low impact toughness of the pipe material**, causing \$29,011 in damage.²
- On January 15, an **accidental massive gas release** at Pump Station 1 of the trans-Alaskan pipeline by Alyeska Pipeline Service Company³ threatened the site at the time. The company that runs the pipeline acknowledges a fire or explosion, had the gas ignited, could have imperiled the station's 60-plus workers and caused "an extended shutdown" of oil fields. There was no ignition or explosion. The incident occurred as BP⁴ workers used a cleaning device called a pig to swab oil out of an old pipeline the company was preparing to decommission. **The 34-inch pipe was among major Prudhoe trunk lines found in 2006 to be ravaged with corrosion, due to BP's admitted lack of proper maintenance.** A large volume of gas then bypassed the pig somehow, and rushed to Pump Station 1, a key asset through which every drop of oil coming off the North Slope must pass.⁵
- On February 1, a **gas pipeline explosion** rocked the area 2 miles (3.2 km) east of Carthage, Texas.⁶
- On February 11, a **pipeline exploded and ignited near a natural gas treatment plant**, near Carthage, Texas. There were no injuries.⁷

The following pertains to the incident on January 4, 2009 in Kanawha County, West Virginia.

1 **TransCanada**, <http://www.columbiapipeline.com/infopost/>

2 **U.S. DOT, Pipeline & Hazardous Materials Safety Administration, 8-2-2011:** http://www.phmsa.dot.gov/staticfiles/PHMSA/PipelineFailureReports/CGT_GT_WV_20090104.pdf

3 <http://www.alyeska-pipe.com/>

4 **British Petroleum:** <http://www.bp.com/>

5 **Joe Romm, Think Progress, 5-12-2010:** <https://thinkprogress.org/stupak-stunner-oil-wells-blowout-preventer-had-leaks-dead-battery-design-flaws-how-can-a-device-that-3363c8775bc9#9c11fnyse>

6 **Adam Gaffin, Universal Hub, 6-14-2015:** <http://www.universalhub.com/2015/peaceful-protest-march-against-west-roxbury>

7 **Reuters Oil Report, 2-11-2009:** <http://uk.reuters.com/article/explosion-dcp-texas-idUKN1135208520090211>

Pipeline Bursts: Causations & Deaths, Injuries, & Damages they Inflicted; 2009 – 2010

The following pertains to the first incident on the previous page that occurred in Kanawha, WV.

DOT US Department of Transportation
PHMSA Pipeline and Hazardous Materials Safety Administration
OPS Office of Pipeline Safety
Eastern Region

Principal Investigator Edwin D. Clarkson, WV PSC
Region Director Byron Coy
Date of Report 8/2/2011
Subject Failure Investigation Report – Columbia Gas Well Line Rupture

Operator, Location, & Consequences

Date of Failure 01/04/2009
Commodity Released Natural Gas
City/County & State Charleston, Kanawha County, WV
OpID & Operator Name 2616 - Columbia Gas Transmission
Unit # & Unit Name 65921 - COCO A, B, C Storage Fields
SMART Activity # 130266
Milepost / Location Latitude: 38.44811, Longitude: -81.44553
Type of Failure Rupture of a 6" storage well line due to internal corrosion complicated by low impact toughness of the pipe material
Fatalities 0
Injuries 0
Description of area impacted Rural area. Not within an HCA.
Property Damage \$29,011

Pipeline Bursts: Causations & Deaths, Injuries, & Damages they Inflicted; 2009 – 2010

Failure Investigation Report – Columbia Gas Transmission Well Line Rupture

Failure Date: 01/04/2009

Executive Summary

On January 4, 2009, a 6.625 inch diameter storage well line in Coco C storage field near Charleston, Kanawha County, WV, ruptured due to internal corrosion pitting complicated by low impact toughness of the pipe material. The failure apparently occurred 4 hours after the line was pressurized from ambient to 1720 psig. The Maximum Allowable Operating Pressure (MAOP) was 1800 psig. The pipe was 1956-1957 vintage ERW pipe with a Specified Minimum Yield Strength (SMYS) of 35,000 psig.

There were no fatalities, injuries, or supply issues as a result of the incident.

System Details

The Coco storage fields are located in Kanawha County, West Virginia. Columbia commenced storage operations in the 1950's. The facility covers over 20,000 acres and includes approximately 60 miles of 4" through 20" pipeline. The pipeline system maximum allowable operating pressure (MAOP) is 1800 psig.

The Coco C storage field is located near the town of Blue Creek in Kanawha County, West Virginia, and approximately 20 miles northeast from Charleston, WV.

The pipeline that failed was well line X-52C-W7329 in the Coco C storage field. The line is 4" diameter coming out of the well and into the measurement station and increases to 6" diameter from the measurement station to the tie in with the field line. The pipe is 1956 - 1957 vintage, X-35, 0.280" wall thickness.

There is no history of internal corrosion related incidents occurring at Coco C field.

Events Leading up to the Failure

The well line was loaded at the time of failure but was not flowing gas. The valve at the tie in to the field line was closed; the well gate was open. The failure apparently occurred 4 hours after the line was pressurized from ambient to 1720 psig. A local resident near the incident location reported the failure to Columbia Gas Transmission (Appendix 1- NRC Report).

Emergency Response

Columbia Gas Transmission responded to the incident and shut down and isolated the section of pipeline.

Summary of Return-to-Service

The well was shut in. Line W-7329 was isolated and a replacement project is being considered for approval in 2012.

Investigation Details

The pipe at the failure location disintegrated into multiple fragments (Appendix 2). Columbia began documentation and recovery of the fragments on 1/7/2009. The pipe fragments were sent out for metallurgical examination. A review of the outside consultants metallurgical report was completed (Appendix 4). The analysis determined that the root cause of failure was internal corrosion complicated by low impact toughness of the pipe material.

Pipeline Bursts: Causations & Deaths, Injuries, & Damages they Inflicted; 2009 – 2010

Failure Investigation Report – Columbia Gas Transmission Well Line Rupture Failure Date: 01/04/2009

As a result of this incident, an internal corrosion review was conducted on 10/16/2009. Based on a review of pipeline records, Columbia noted that four other pipelines might have possible low impact toughness properties. After a review of the metallurgical report and the internal corrosion assessment, Columbia developed a remedial plan for examination and selected replacement of Coco C storage lines. (Appendix 5 / Appendix 7).

Findings & Contributing Factors

The pipe ruptured due to internal corrosion pitting complicated by low impact toughness of the pipe material (Appendix 4). The corrosion pitting was the result of sulfur and chloride containing compounds, and third party investigator speculated that the low point in the pipeline under creek retained free liquids. Future plans are to replace the entire well line in 2012. A means for liquid removal will be considered in the replacement project.

Appendices

- 1 NRC Report #893963
- 2 Annotated Photographs
- 3 Operator Accident/Incident Report to PHMSA
- 4 Laboratory Analysis (Matco Services lab analysis for the failed section)
- 5 Preliminary Plan
- 6 Map
- 7 Update to NiSource Preliminary Plan Appendix 5

Pipeline Bursts: Causations & Deaths, Injuries, & Damages they Inflicted; 2009 – 2010



Date 1/6/09
Columbia Gas Transmission Inc.
Coco Storage C field
Line number X-52C-W7329 diameter 6.625 inches, .280 inch wall thickness, X-35
Description of photo – Pipeline indicates internal corrosion.



Date 1/6/09
Columbia Gas Transmission Inc.
Coco Storage C field
Line number X-52C-W7329 diameter 6.625 inches, .280 inch wall thickness, X-35
Description of photo – Tie in side where the fracture stops at a weld

Pipeline Bursts: Causations & Deaths, Injuries, & Damages they Inflicted; 2009 – 2010



Date 1/6/09
Columbia Gas Transmission Inc.
Coco Storage C field
Line number X-52C-W7329 diameter 6.625 inches, .280 inch wall thickness, X-35
Description of photo – Tie in side where fracture stops at weld



Date 1/6/09
Columbia Gas Transmission Inc.
Coco Storage C field
Line number X-52C-W7329 diameter 6.625 inches, .280 inch wall thickness, X-35
Description of photo – Short section of line 7329 indicating brittle fracture



Date 1/6/09

Columbia Gas Transmission Inc.

Coco Storage C field

Line number X-52C-W7329 diameter 6.625 inches, .280 inch wall thickness, X-35

Description of photo – Short section of line 7329 indicating brittle fracture

Pipeline Bursts: Causations & Deaths, Injuries, & Damages they Inflicted; 2009 – 2010



Date 1/6/09

Columbia Gas Transmission Inc.

Coco Storage C field

Line number X-52C-W7329 diameter 6.625 inches, .280 inch wall thickness,

Description of photo – Short section of line 7329 indicating brittle fracture

- At approximately 5 p.m. on February 18, **a rupture of pipeline near the pump station** and terminal located in Cygnet, Ohio, owned by Philadelphia-based Sunoco, **resulted in one of the largest oil spills in Wood County history**. Upon learning of the release, the company immediately shut down the pipeline, stopped operations at the pump station and terminal, notified the appropriate authorities, and began an emergency response. As of 11:05 a.m. ET on February 19, the release had been stopped from the pipe. The **damaged pipeline, which was operating at the time, released 1,250 barrels (199 m3) of crude oil into a farm field**. Eventually, 782 of the 1,250 barrels (199 m3) released were recovered. Some of the crude oil, approximately 200 barrels (32 m3), did contaminate a local creek.
- On May 4, Kinder Morgan's Florida Gas Transmission pipeline⁸ burst near Palm City and Hobe City (*near Port Salerno, Florida*). The **explosion ejected 106 feet of buried pipe weighing about 5,000 pounds out of the ground and onto the right-of-way between Interstate 95 and the Florida Turnpike (SR-91)**. The rupture was **near a high school that was within the 366-foot potential impact radius**. Two people were injured when their car ran off the road, and a **Sheriff's deputy walked through a dense cloud and inhaled natural gas**. The escaping gas did not ignite. The leak **caused \$596,218 in property damage**. FGT was cited for safety violations: failing to identify a high-consequence area, failing to test operators for alcohol and drugs, and failing to have prompt emergency response; PHMSA assessed a \$95,000 fine.⁹
- On May 5, **a natural gas pipeline exploded and caught on fire, near Rockville, Indiana in Parke County**, about 24 miles (39 km) north of Terre Haute, Indiana. The **cause of this failure was determined to be external corrosion**. Additional work performed as a result of this order provided **significant indications of external corrosion in various sections of this line**. Pictures have been released around the area showing the damage caused. 52 people were evacuated in a one-mile (1.6 km) area of the explosion.^{10 11}
- On May 21, **an Enbridge pipeline pig sending trap in Superior, Wisconsin leaked from operator error, spilling about 6500 gallons of crude oil**. 700 cubic yards of contaminated soil had to be removed.^{12 13}

8 **Kinder Morgan's Florida Gas Transmission pipeline:**

http://www.kindermorgan.com/pages/business/gas_pipelines/east/FGT/default.aspx

9 **U.S. DOT, Pipeline & Hazardous Materials Safety Administration:**

http://primis.phmsa.dot.gov/comm/reports/enforce/documents/220091002H/220091002H_CAO_05072009.pdf?nocache=4283

10 **U.S. DOT, Pipeline & Hazardous Materials Safety Administration:**

http://primis.phmsa.dot.gov/comm/reports/enforce/documents/320141008S/320141008S_Notice%20of%20Proposed%20Safety%20Order_12242014.pdf

11 **U.S. DOT, Pipeline & Hazardous Materials Safety Administration:**

http://primis.phmsa.dot.gov/comm/reports/enforce/documents/320091009H/320091009H_CAO_05132009.pdf?nocache=6515

12 **U.S. DOT, Pipeline & Hazardous Materials Safety Administration:**

http://primis.phmsa.dot.gov/comm/reports/enforce/documents/320125018/320125018_NOPV%20PCP_08272012.pdf

13 **Pro Publica, Pipeline Safety Tracker, 5-21-2009:** <http://projects.propublica.org/pipelines/incidents/272967>

Pipeline Bursts: Causations & Deaths, Injuries, & Damages they Inflicted; 2009 – 2010

The following information pertains to the first incident on the previous page in Cygnet, Ohio.

Pipeline Failure Investigation Report

Pipeline System: 22-inch Maumee Pipeline **Operator:** Mid-Valley Pipeline Company
Location: Cygnet, Ohio **Date of Occurrence:** 2-18-2009
Medium Released: Crude Oil **Quantity:** 1250 bbls

PHMSA Arrival Time & Date: 2-19-2009; 10:00 a.m. **Total Damages \$** 4,614,052

Investigation Responsibility: State PHMSA NTSB Other _____

Company Reported Apparent Cause: Corrosion Excavation
 Natural Forces Incorrect Operation Other Outside Force Damage
 Material and/or Welds Equipment and Operations Other _____

Rupture Yes No
Leak Yes No
Fire Yes No
Explosion Yes No
Evacuation Yes No Number of Persons 1 Area n/a

Narrative Summary

Short summary of the Incident/Accident which will give interested person's sufficient information to make them aware of the basic scenario and facts.

On February 18, 2009, Mid Valley Pipeline's 22" Maumee Pipeline (Lima to Cygnet) experienced a leak at a 12" diameter branch connection. The damaged pipeline, which was operating at the time, released 1250 barrels of crude oil into a farm field. Eventually, 782 of the 1250 barrels released were recovered. Some of the crude oil, approximately 200 barrels, did contaminate a local creek. There were no fatalities, or injuries. One person was evacuated for several hours. The release did occur in a high consequence area (drinking water).

A PHMSA engineer conducted an on-site investigation of the failure. The investigative summary is as follows:

The failure occurred at approximately 3:00 p.m. EST on February 18, 2009. The failure is located near milepost marker 46, in a rural area of Wood County, south of Cygnet, OH. The failure was detected at 4:55 p.m. the same day when a Mid Valley Pipeline (MVP) employee driving near the Cygnet pump station discovered a pool of crude oil on the ground surface. The employee notified the MVP control center, which immediately shut down the Maumee Pipeline. MVP blocked in the line segment at 5:00 p.m. by remotely isolating the upstream (Lima) and downstream (Cygnet) pump stations. The pipeline was repaired and placed back in service on February 18, 2009.

In July 2003, MVP de-commissioned the 12" branch line. At the time of failure, the branch connection contained the attachment weld, approximately 50-inches of 12" diameter pipe, a 12" diameter valve (flanged) and a blind flange. Beyond the blind flange, the 12" branch connection piping was removed. The pipeline experienced a crack in the 12" branch connection attachment weld. The crack developed at the top (12 O'clock) position of the attachment weld, oriented circumferentially with the branch connection and longitudinally with the Maumee Pipeline. The crack measured 11" long and 0.125" at the maximum width. The driving stress for the crack was produced by the combined loading of the 22" x 12" diameter branch connection, the valve, flanging and somastic "mass" on the attachment weld.

The portion of the pipeline containing the failure is comprised of 22" diameter by 0.344" wall thickness API 5L - Grade B, seamless pipe, installed in 1949. The 12" diameter nominal branch line was attached at the 9 O'clock position to the mainline with a self reinforcing weld-on outlet fitting. The reported maximum operating pressure (MOP) is 788 psig. The operating pressure at the time and location of the failure was 470 psig. The MOP was established in accordance with 195.303, Risk Based Alternative to Pressure Testing. The pipeline external corrosion protection system consists of a Somastic coating and distributed galvanic anodes.

Pipeline Failure Investigation Report

MVP identified two additional de-commissioned branch connections in the Maumee Pipeline System as a result of this failure. These branch connections were cut out and removed from the Maumee Pipeline System.

The Maumee Pipeline System is a 994 mile long crude oil pipeline running from Longview, TX to Samaria, Michigan.

Operator ID: 12470
Unit ID: 3733
SMART Activity ID: 124413

Region/State: Central Region

Principal Investigator: Gery Bauman

Date: November 5, 2010

Reviewed by: _____

Title: Regional Director

Date: _____



Photo 1 – View looking north from leak site. Tanks visible in the photo are no longer in service. The arrow points to Tank Farm Road.

Date Taken: 2-19-2009
Taken By: Gery Bauman



Photo 6 - The photo shows origin of the leak. The arrow points to the crack.

Date Taken: 2-19-2009
Taken By: Gery Bauman



Photo 3 - The photo shows the view south of the branch connection. The tree line indicates Rocky Ford Creek. Field tile drain to the south into the Rocky Ford Creek and crude oil did reach the creek through the tile.

Date Taken: 2-19-2009
Taken By: Gery Bauman

Note: The Dakota Access Pipeline is located ~95 feet *below* the Missouri River¹⁴; a pipeline burst beneath the surface of the river *would* reach the river, & would be very difficult to isolate due to the depth of the pipe itself.

¹⁴ **Dakota Access Pipeline Facts, “Construction on Dakota Access is mechanically complete and line fill operations are set to conclude mid-May”:** <https://dapipelinefacts.com/>



Photo 9 - The photo show booms in the Rocky Ford Creek just downstream of the Tank Farm Road.

Date Taken: 2-19-2009
Taken By: Gery Bauman

Note: “The release did occur in a high consequence area (drinking water)” according to page 11 of this document (page 1 of DOT's report).



Photo 10 - The photo shows the crude oil contamination along the banks of the Rocky Ford Creek.

Date Taken: 2-19-2009
Taken By: Gery Bauman

Pipeline Bursts: Causations & Deaths, Injuries, & Damages they Inflicted; 2009 – 2010

- On July 15, **an explosion occurred at Kinder Morgan's Midcontinent Express pipeline¹⁵ natural gas metering station that was under construction, while it was being pressure tested with nitrogen**, in Smith County, Mississippi. One worker was killed, and two others injured.¹⁶
- On August 10, **operators of a Belle Fourche pipeline¹⁷ incorrectly operated the line, causing it to fail**, near Edgerton, Wyoming¹⁸. About **30,000 gallons of crude oil was spilled**, with about 1,200 gallons being lost.¹⁹
- On August 17, a **pipeline was found leaking** by an aerial patrol in Atoka County, Oklahoma²⁰. 50 barrels (7.9 m^3) of diesel fuel were estimated to have been released as a result of this accident, and none of it was recovered.²¹
- On October 7, **a leaking pipeline carrying jet fuel was accidentally ignited by a pipeline repair crew** in Upton County, Texas.²²
- On October 28, Kinder Morgan's Natural Gas Pipeline Company of America²³ **above-ground storage tank north of St. Elmo, Illinois caught fire**, injuring two workers. **Welding caused the tank to ignite resulting in several explosions**. Two workers were taken to the hospital.^{24,25}
- On November 5, two people were hurt when an Kinder Morgan's El Paso Natural Gas²⁶ **pipeline exploded** in the Texas Panhandle near Bushland, Texas. **The explosion left a hole about 30 yards by 20 yards** and close to 15 feet (4.6 m) deep. The **orange inferno rose about 700 feet in the air; the blast incinerated the home of the Jose Torres family, injuring his wife Agnieszka and daughter Franczeska**. The failure was in an abandoned tap, but the exact failure reason remains unknown. The explosion cause \$436,136 in property damage.^{27 28 29}

15 **Kinder Morgan's Midcontinent Express pipeline:**

http://www.kindermorgan.com/pages/business/gas_pipelines/central/MEP/default.aspx

16 **Bert Case, KLTV 7, 7-16-2009:** <http://www.kltv.com/Global/story.asp?s=10741392&clintype=printable>

17 **Belle Fourche pipeline:** <http://www.bellefourchepipeline.com/>

18 **Edgerton, Wyoming website:** <http://www.city-data.com/city/Edgerton-Wyoming.html>

19 **U.S. DOT, Pipeline & Hazardous Materials Safety Administration:**

http://primis.phmsa.dot.gov/comm/reports/operator/OperatorIM_opid_1248.html?nocache=1673#_Incidents_tab_3

20 **Atoka County, Oklahoma website:** <http://atoka.oklahoma.usassessor.com/>

21 **U.S. DOT, Pipeline & Hazardous Materials Safety Administration:**

http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Pipeline/Failure%20Reports/Explorer_HL_OK_2009-08-17_508.pdf

22 **Elias Hernandez, Texas-Fire, 10-8-2009:** <https://web.archive.org/web/20120315222201/http://www.texas-fire.com/2009/10/upton-county-gas-line-fire-caused-by-leak/>

23 **Kinder Morgan's Natural Gas Pipeline Company of America's website:**

http://www.kindermorgan.com/business/gas_pipelines/central/NGPL/

24 **Cathy Thoele, The Effingham Daily News, 11-5-2009:** http://www.effinghamdailynews.com/news/local_news/fire-rocks-plant-north-of-st-elmo/article_944c2536-0733-5549-ba26-baacb0e805a2.html

25 **Nicole Howley, Justice News Flash, 11-3-2009:** http://www.justicenewsflash.com/2009/11/03/fire-explosion-injures-2-gas-plant-workers_200911032491.html

26 **Kinder Morgan's El Paso Natural Gas Company, L.L.C.:**

<http://pipeportal.kindermorgan.com/PortalUI/DefaultB.aspx?TSP=EPNG>

27 **U.S. DOT, Pipeline & Hazardous Materials Safety Administration, 11-10-2009:**

http://primis.phmsa.dot.gov/comm/reports/enforce/documents/420091021H/420091021H_CAO_11102009.pdf?nocache=4008

28 **JC Cortez & Kevin Welch, Amarillo Globe-News, 6-25-2014:** <http://amarillo.com/news/local-news/2014-06-25/bushland-neighborhood-evacuated-after-gas-pipeline-rupture>

29 **U.S. DOT, Pipeline & Hazardous Materials Safety Administration, 4-13-2011:**

http://primis.phmsa.dot.gov/comm/reports/enforce/documents/420091021H/420091021H_Closure_04132011.pdf



“Bushland Texas El Paso Natural Gas Pipeline Explosion”:

<http://durangotexas.blogspot.com/2009/11/bushland-texas-el-paso-natural-gas.html>

- Also on November 14, 2009, a newly built 42-inch **gas transmission pipeline** near Philo, Ohio **failed on the second day of operation**. There was no fire, but evacuations resulted. Several indications of pipe deformation were found.^{30 31}
- From December 3 to 4, **a Minnesota Pipeline carrying crude oil leaked** in Todd County, Minnesota, spilling **about 5,000 barrels** of crude. **Pipeline workers had been repairing sections of the 16-inch pipe in a rural area, left on the afternoon of December 3, and the spill occurred during the evening hours of December 3–4.**^{32 33}
- On December 23, **a crude oil pipeline started leaking** in Galveston, Texas. **An estimated 120 barrels (19 m³) of crude oil were released into the environment.**³⁴

30 U.S. DOT, Pipeline & Hazardous Materials Safety Administration, 2-17-2010:

http://primis.phmsa.dot.gov/comm/reports/enforce/documents/320091024H/320091024H_CAO_02172010.pdf?nocache=1083

31 U.S. DOT, Pipeline & Hazardous Materials Safety Administration, 12-21-2009:

http://primis.phmsa.dot.gov/comm/reports/enforce/documents/320091024H/320091024H_Notice%20of%20Proposed%20CAO_12212009.pdf

32 Energy Pipeline News, 12-8-2009: <http://energypipelinenews.blogspot.com/2009/12/kochs-mpc-line-spills-210000-gallons-of.html>

33 Pro Publica Pipeline Safety Tracker, 12-4-2009: <http://projects.propublica.org/pipelines/incidents/273107>

34 U.S. DOT, Pipeline & Hazardous Materials Safety Administration, 9-29-2010:

<http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Pipeline/Failure%20Reports/Enterprise%20HL%20TX%202009-12-23.pdf>

2010

- On January 2, **Enbridge's³⁵ Line 2 ruptured** near Neche, North Dakota³⁶, **releasing about 3,784 barrels of crude oil**, of which only 2,237 barrels of were recovered. **The cause was a material defect.**³⁷
- On January 7, **a gas pipeline exploded** near Barksdale Air Force Base³⁸, Louisiana, in January, **killing a pipeline employee.**³⁹
- On February 25, **a natural gas liquids (NGL) pipeline ruptured** near Pond Creek, Oklahoma⁴⁰, **releasing over 575,000 US gallons (2,180,000 L) of NGL's** (Natural Gas Liquids), & forcing road closures.⁴¹
- On March 1, Mid-Valley Pipeline⁴² identified a **release of crude oil in the manifold area of the Mid-Valley tank farm** in Longview, Texas. **Crude oil was observed "gushing" from the soil in the manifold area.** About **198 barrels of crude oil were estimated to have been released.**⁴³
- On March 15, **a 24-inch gas pipeline burst** near Pampa, Texas.⁴⁴
- On March 25, there was **a release of 1700 barrels of Vacuum gas oil (VGO) from the FM-1 pipeline into an open in-ground valve pit and the surrounding area** in the West Yard of the Sunoco, R&M Philadelphia refinery⁴⁵ in Philadelphia, Pennsylvania⁴⁶.

35 http://www.enbridge.com/~media/www/Site%20Documents/Delivering%20Energy/2012_Q1%20System%20Config.pdf

36 **Neche, North Dakota city data:** <http://www.city-data.com/city/Neche-North-Dakota.html>

37 **"Pipeline explosion at Barksdale kills civilian – Air Force News | News from Afghanistan & Iraq".** Air Force Times. Associated Press. January 7, 2010. Retrieved April 2, 2013.

38 **Barksdale Air Force Base:** <http://www.barksdale.af.mil/>

39 **"Pipeline explosion at Barksdale kills civilian – Air Force News | News from Afghanistan & Iraq".** Air Force Times. Associated Press. January 7, 2010. Retrieved April 2, 2013.

40 **Pond Creek, Oklahoma official website:** <http://www.pondcreekok.com/>

41 **"Highway closed for gas leak " Local news " The Enid News and Eagle, Enid, OK".** Enidnews.com. February 25, 2010. Retrieved April 2, 2013.: http://www.enidnews.com/news/local_news/highway-closed-for-gas-leak/article_286e869b-ab4c-57d0-8ba3-e3f3d53963a5.html

42 **Mid-Valley Pipeline, Bloomberg report:** <http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapid=4155830>

43 **Failure Investigation Report – Mid-Valley Pipeline Internal Corrosion Pipeline and Hazardous Materials Safety Administration, November 7, 2011, accessed September 5, 2015, 31 pages:** <http://www.phmsa.dot.gov/staticfiles/PHMSA/PipelineFailureReports/Mid-Valley%20Pipeline%20HL%20TX%202010-03-01%20508.pdf>

44 **Gamm, Joe (March 16, 2010). "No injuries in gas line rupture north of Pampa".** Amarillo Globe-News. Retrieved April 2, 2013: http://amarillo.com/stories/031610/new_news7.shtml#.V98t8vArLIU

45 **Philadelphia Energy Solutions:** <http://pes-companies.com/>

46 **City of Philadelphia website:** <http://www.phila.gov/Pages/default.aspx>



PHOTO: “**Mid-valley pipeline spill, March 1, 2010**”: <http://www.ksla.com/story/26835660/sunoco-update-2550-barrels-of-oil-recovered-so-far>

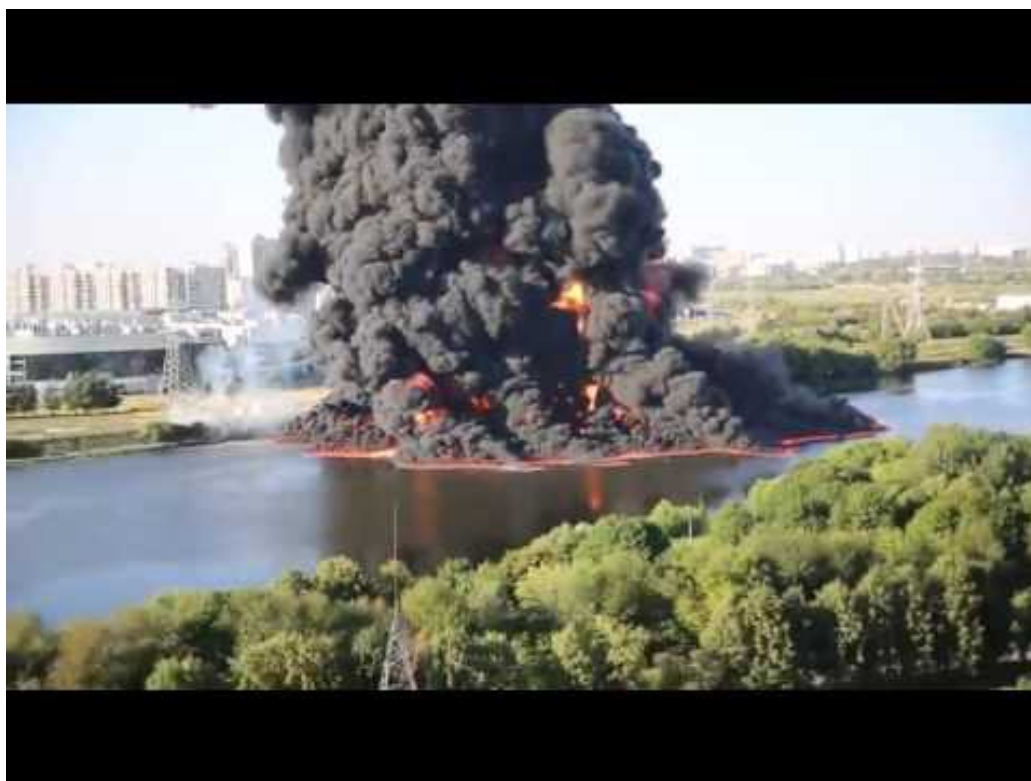


PHOTO: “**Enbridge pipeline burst in Neche, North Dakota – January 2, 2010**”: <https://www.youtube.com/watch?v=UCG2eMSbdqY>

Pipeline Bursts: Causations & Deaths, Injuries, & Damages they Inflicted; 2009 – 2010

- On April 5, **a crude oil pipeline ruptured** near Green River, Wyoming⁴⁷. **At least 84,000 US gallons (320,000 L) of crude were spilled. Corrosion in the pipeline was the cause.**⁴⁸
- On April 17 Enbridge discovered **a leak on the 26-inch Line 2** near Deer River, Minnesota⁴⁹. **This leak was due to a crack-like feature associated with the longitudinal weld seam on the inside of the pipe.**
- On April 23, **a pipeline ruptured** near Niles, Kansas, **due to previous excavation damage. About 1,659 barrels of natural gasoline contaminated the local ecosystem.**⁵⁰
- On May 29, **one of BP's Amoco pipelines**⁵¹ **leaked nearly 89,000 gallons of gasoline into a farm field.** The leak occurred in Constantine Township, St. Joseph County⁵², Michigan. The cause was from **a manufacturing defect in the pipe.**⁵³
- On June 7, **a 36-inch gas pipeline explosion and fire** in Johnson County, Texas⁵⁴, **was caused by workers installing poles for electrical lines. One worker killed, and six were injured. Confusion over the location and status of the construction work lead to the pipeline not being marked beforehand.**⁵⁵
- The Red Butte Creek oil spill. On June 12, a Chevron⁵⁶ **crude oil pipeline, damage by lightning, ruptured, causing 800 barrels (130 m³) of crude to spill into Red Butte Creek in Salt Lake City, Utah. Crude then flowed into a pond in Liberty Park.**⁵⁷

47 **City of Green River website:** <http://www.cityofgreenriver.org/>

48 <https://web.archive.org/web/20100803143750/http://www.nwf.org/News-and-Magazines/Media-Center/News-by-Topic/Global-Warming/2010/~-/media/PDFs/Global%20Warming/Reports/Full-Oil-Incident-List.ashx>

49 **Deer River, Minnesota Chamber of Commerce:** <http://www.deerriver.org/>

50 **"PHMSA: Stakeholder Communications – Operator Information". dot.gov. Retrieved May 23, 2016. :** http://primis.phmsa.dot.gov/comm/reports/operator/OperatorIM_opid_395.html?nocache=1547#_Incidents_tab_3

51 **BP's Amoco:** <http://bp-amoco-gas-stations.find-near-me.info/>

52 **Constantine Township, St. Joseph County website:** http://www.stjosephcountymi.org/localgovernment/constantine_ts.htm

53 **"PHMSA: Stakeholder Communications – Operator Information". dot.gov. Retrieved May 23, 2016. :** http://primis.phmsa.dot.gov/comm/reports/operator/OperatorIM_opid_395.html?nocache=1547#_Incidents_tab_3

54 **Johnson County, Texas home page:** <http://www.johnsoncountytexas.org/>

55 **Wilder, Forrest (November 26, 2010). "The Fire Down Below". The Texas Observer. Retrieved April 2, 2013:** <https://www.texasobserver.org/the-fire-down-below/>

56 **Chevron oil home page:** <https://www.chevron.com/>

57 **U.S. Department of Transportation, Pipeline & Hazardous Materials Safety Administration:** http://primis.phmsa.dot.gov/comm/reports/enforce/documents/520105028/520105028_NOPV%20PCP%20PCO_11012010.pdf?nocache=2771



PHOTO: “Pipeline explosion in Johnson County, Texas - 1 killed, 6 injured”:
<http://www.nbcdfw.com/news/local/Live-Video-Explosion-Rocks-North-Texas-95802099.html>)

- On July 26, the Kalamazoo River oil spill: Enbridge Energy Partners LLP (Enbridge), reported that **a 30-inch (760 mm) pipeline** belonging to Enbridge **burst in Marshall, Michigan. The leak was not reported to Enbridge for 17 hours.** Enbridge estimates **over 800,000 US gallons (3,000,000 L) of crude oil leaked into Talmadge Creek, a waterway that feeds the Kalamazoo River, whereas EPA reports over 1,139,569 gallons of oil have been recovered as of November 2011.**⁵⁸
- On August 10, the U.S. Environmental Protection Agency (EPA)⁵⁹ & the U.S. Justice Department⁶⁰ announced that Plains All American Pipeline⁶¹ & several of its operating subsidiaries have agreed to spend approximately \$41 million to upgrade 10,420 miles (16,770 km) of crude oil pipeline operated in the United States. The settlement resolves Plains' Clean Water Act violations for **ten crude oil spills in Texas, Louisiana, Oklahoma, and Kansas**, & requires the company to pay **a \$3.25 million civil penalty.**⁶²
- On August 17, smell from a mixture of gasoline and diesel fuel were detected in Hammond, Indiana. The source was from **a leaking Amoco/BP pipeline in the area, and, about 38,000 gallons of the mixture was released. about 5,000 gallons of the spillage was not recovered. The cause was from external corrosion to the pipeline.**⁶³
- On September 9, **a pipeline leaked crude oil** near Lockport, Illinois. EPA officials said the spill was **near wetlands that house several endangered species.** Federal officials said **about 270,000 US gallons (1,000,000 L) of oil were released in Lockport and Romeoville**, about 35 miles (56 km) southwest of Chicago.⁶⁴

58 **U.S. EPA "EPA Response to Enbridge Spill in Michigan"**. Epa.gov. Retrieved April 2,2013.: https://web.archive.org/web/20121007172122/http://issuu.com/toledoblade/docs/07302010_the_blade

59 **Environmental Protection Agency (EPA) website:** <https://www3.epa.gov/>

60 **U.S. Department of Justice:** <https://www.justice.gov/>

61 **Plains All American Pipeline, L.P., Midstream Energy Company:** <http://www.plainsallamerican.com/>

62 **"Plains All American Pipeline Settlement | Compliance and Enforcement | US EPA". Epa.gov. Archived from the original on April 13, 2013. Retrieved April 2, 2013.:**

<https://web.archive.org/web/20130413233436/http://www.epa.gov/compliance/resources/cases/civil/cwa/plainspipeline.html>

63 **Times Staff (August 18, 2010). "Hammond officials deal with oil leak". *nwitimes.com*. Retrieved May 23, 2016:** http://www.nwitimes.com/news/local/lake/hammond/hammond-officials-deal-with-oil-leak/article_0227a3a0-e07d-5309-bf82-197fa4d8a0fb.html

64 **U.S. Department of Transportation, Pipeline & Hazardous Materials Safety Administration:** http://primis.phmsa.dot.gov/comm/reports/enforce/documents/120105008H/120105008H_Amended%20CAO_11242010.pdf



PHOTO: **“Kalamazoo River Oil Spill, July 26, 2010”**: <http://michiganradio.org/post/2nd-anniversary-enbridge-oil-spill-look-back>

- On December 1, **a valve on a crude oil pipeline leaked about 500 barrels (79 m³) of crude in Salt Lake City, Utah.** This failure was only **100 yards from the June 2010 failure on the same pipeline.**⁶⁵
- On December 8, at East Bernard, Texas⁶⁶, **a 24” diameter Tennessee Gas Pipeline exploded, blasting a 12-foot section of ruptured pipe 295 feet and caused \$715,000 in property damage. It took 6 hours for the pipe system to blow down. The cause of the leak was a full guillotine failure of the pipe caused by internal corrosion microbiologically induced due to moisture in the pipe.**⁶⁷
- On December 17, **a gas line fire and explosion** just outside Corpus Christi, Texas⁶⁸ city limits **left one person critically injured. A man was working on removing an abandoned pipeline when it exploded, and the man's face was severely burned.**⁶⁹
- On December 21, **a crude oil pipeline was discovered leaking into the Dominguez Channel in the Port of Los Angeles. Over 1,000 gallons of crude oil was recovered, but the pipeline company was alleged to have failed to report the spill to State or Federal pipeline authorities. A 61 count criminal complaint was later filed in this accident.**⁷⁰
- On December 28, a pipeline at **an underground gas storage facility** in Covington County, Mississippi⁷¹ **burst, forcing the evacuation of about two-dozen families for over a week.**⁷²

65 "Was Chevron's response too slow? | The Salt Lake Tribune". *Sltrib.com*. December 3, 2010. Retrieved April 2, 2013.: <http://www.sltrib.com/sltrib/home/50804000-76/chevron-pipeline-leak-lake.html.csp>

66 East Bernard, Texas *home page*: <http://www.eastbernardtx.com/>

67 PHMSA Failure Investigation Report, July 31, 2011: http://www.phmsa.dot.gov/pv_obj_cache/pv_obj_id_809F127A4DA7F465E375A04D19FF2D8FFBAB1100/filename/TGP_GT_TX_20101208.pdf

68 City of Corpus Christi *home page*: <http://www.cctexas.com/>

69 "Gas Line Fire Explosion Critically Burns Man's Face". *South Texas*: <http://www.universalhub.com/2015/peaceful-protest-march-against-west-roxbury>

70 "Long Beach pipeline company charged in oil spill". *Press-Telegram*. Retrieved April 2, 2013: <http://www.presstelegram.com/technology/20111229/long-beach-pipeline-company-charged-in-oil-spill>

71 Covington County, Mississippi Chamber of Commerce *home page*: <http://www.covingtonchamber.com/>

72 "Covington evacuees still await word to return home – WDAM – Channel 7 – Serving Hattiesburg, Laurel and the Pine Belt". *WDAM*. March 29, 2013. Retrieved April 2, 2013: <http://www.wdam.com/Global/story.asp?S=13782362>



PHOTO: **“Salt Lake City, Utah - the second spill from the same pipeline in a 6 month period”:**
<http://www.desmogblog.com/salt-lake-city-oil-spill-chevron-pipeline-leaks-thousands-gallons-second-time-six-months>