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confluence with the Yellowstone River. Several trenches were constructed near the ruptured pipe for product collection points. As of September 25, 2002, a vacuum truck had recovered approximately 21,000 US gallons (79,000 L) of gasoline [and water] from the boomed locations and trenches.[59][60]

- On November 2, a Chevron pipeline ruptured near Corinne, Utah, spilling about 450 barrels of petroleum. The cause was from external corrosion.[61]
- On December 10, a farmer plowing a field hit and ruptured a Williams Companies pipeline, near Lawrence, Kansas. About 4,700 gallons of gasoline were spilled. Later, it was noted that particular pipeline lacked soil coverage in places, including some exposed spots. There were no injuries.[62][63]

2003[edit]

- On January 24, an Enbridge crude oil pipeline ruptured at a terminal in Douglas County, Wisconsin. Some of the crude oil flowed into the Nemadji River. Over 100,000 US gallons (380,000 L) were spilled.[29]
- On February 2, a natural gas pipeline ruptured near Viola, Illinois, resulting in the release of natural gas which ignited. A l6-foot section of the pipe fractured into three sections, which were ejected to distances of about 300 yards from the failure site.[64]
- On February 20, a 24-inch gas transmission pipeline started leaking in Scott County, Missouri, underneath the Mississippi River. A shifted pipeline weight has caused damage to the pipeline.[65]
- On or about February 22, 2003, approximately 788 barrels of gasoline were discharged from a portion of Plantation Pipeline in Hull, Georgia, some of which entered into an unnamed tributary of East Sandy Creek and its adjoining shorelines. The spill resulted from a failed gasket on a buried block valve.
- On February 27, dropping temperatures caused an Enbridge pipeline to fail in Samaria, Michigan. 130 barrels of crude oil were spilled.
- On March 13, a seam failed on an 8-inch Dixie Pipeline propane line near Appling, Georgia, releasing about 110,000 gallons of propane. There were no injuries. The pipe split due to seam failure.[66][67]
- On March 23, a 24-inch El Paso Natural Gas pipeline near Eaton, Colorado exploded. The explosion sent flames 160 meters in the air, forcing evacuations. No one was injured. The heat from the flames melted the siding of two nearby houses and started many smaller grass fires.[68]
- On April 1, a 12-inch ConocoPhillips petroleum products pipeline ruptured, spilling about 1,000 barrels of Diesel fuel near Ponca City, Oklahoma, with of the fuel getting into Doga Creek. There were no injuries. Low Frequency ERW pipe seam failure was suspected as the cause.[69]
- On May 1, a 26-inch Williams Companies natural gas transmission pipeline failed near Lake Tapps, Washington. A neighboring elementary school, a supermarket, and 30 to 40 houses in approximately a 4-mile (6.4 km) area were evacuated. There was no fire or injuries. Land movement was suspected at first, but the failure was later determined to be from stress corrosion cracking. There were four previous failures on this pipeline in the preceding eight years.[70][71]
- On May 8, an 8-inch LPG pipeline failed near Lebanon, Ohio. About 80 houses and one school in the area were evacuated. There was no fire or injuries.[72]
- On May 20, a 30-inch gas pipeline exploded and burned near Nederland, Texas. The cause of the failure was internal corrosion, and the damages were estimated to be $6,901,322.[73][74]
- On July 2, excavation damage to a natural gas distribution line resulted in an explosion and fire in Wilmington, Delaware. A contractor hired by the city of Wilmington to replace sidewalk and curbing, dug into an unmarked natural gas service line with a backhoe. Although the service line did not leak where it was struck, the contact resulted in a break in the line inside the basement of a nearby building, where gas began to accumulate. A manager for the contractor said that he did not smell gas and therefore did not believe there was imminent danger and that he called an

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employee of the gas company and left a voice mail message. At approximately 1:44 p.m., an explosion destroyed two residences and damaged two others to the extent that they had to be demolished. Other nearby residences sustained some damage, and the residents on the block were displaced from their houses for about a week. Three contractor employees sustained serious injuries. Eleven additional people sustained minor injuries.[75]

- On July 3, a jury found Texas-New Mexico Pipeline (TNMP) Company guilty of fraud, gross negligence and willful misconduct in concealing a 1992 crude oil pipeline leak beneath a Midland, Texas residential subdivision, before selling the pipeline to EOTT Energy in 1999. Oil was discovered in the water table in late 2000, and in March 2001 a group of Midland residents sued EOTT, TNMP and Equilon. Residents living on affected land also received settlements. The spill was estimated in 2003 to be 9,000–13,000 barrels. 190 boxes full of TNMP documents about the pipeline dating from the late 1980s to early 1990s (prior to EOTT Energy taking over the pipeline) were dug up from a 45-foot-deep hole at a site along the company's pipeline in New Mexico.[76][77]
- On July 10, a 16-inch Citgo petroleum products pipeline failed in Cook County, Illinois. About 25 barrels of gasoline were spilled from the pipeline. A crack in the pipe had developed at a dent. There was no fire or injured reported.[78]
- On July 16, a 12 3/4-inch pipeline burst in Barnes County, North Dakota, releasing 9,000 barrels of propane, which ignited. There were no casualties. During repairs, mechanical damage was seen on 2 nearby section of this pipeline.[79]
- On July 30, a Kinder Morgan pipeline in Tucson, Arizona ruptured, and sprayed 16,548 gallons of gasoline on five houses under construction, and flooding nearby streets with gasoline. The resulting pipeline closure caused major gas shortages and price increases in the state. The failure at first was thought to be from LF-ERW flaws, but tests showed it was due to stress corrosion cracking. A hydrostatic test that was performed on this pipeline after repairs failed again 40 feet (12 m) from the first failure.[80][81][82][83][84]
- On August 8, a 26-inch Kinder Morgan and Myria Holdings Natural Gas Pipeline Company of America transmission pipeline ruptured in Caddo County, Oklahoma, releasing about 84,000 MCF of natural gas. A 54-foot long section of 26" diameter pipe had blown out and landed 30 feet from the ditch. Evacuations took place within 3/4 of a mile from the release, but there was no fire or casualties. Stress corrosion cracking was identified as the pipe failure's cause.[85]
- On September 26, a propane pipeline at the Phillips Petroleum storage facility in Cahokia, Illinois ruptured, sending flames high into the air and sparking small grass fires in the area.
- On October 6, a 12-inch petroleum products pipeline ruptured in Johnson County, Kansas, spilling about 100 to 200 barrels of Diesel fuel. Some of the Diesel contaminated a nearby waterway. There were no injuries.[86]
- On October 13, a failure on an Enbridge pipeline near Bay City, Michigan spilled 500 barrels of crude oil.[87][88]
- On October 14, a leak on what was originally the Big Inch 24-inch of natural gas occurred in Orange County, Indiana. There were no injuries or evacuations. The pipeline had been installed in 1943.[89]
- On November 2, a Texas Eastern Transmission natural gas pipeline exploded in Bath County, Kentucky, about 1.5 km south of a Duke Energy pumping station. A fire burned for about an hour before firefighters extinguished it. No one was injured and no property damage was reported.[29]
- On November 9, an 8-inch Buckeye Partners pipeline failed near Mazon, Illinois. While repairs were being tested on this pipeline on November 14, another section of this pipeline failed about 1500 feet from the first leak. About ten barrels of gasoline and Diesel fuel were spilled by the two leaks, requiring soil removal. External corrosion caused both failures. There were no injuries.[90]
- On December 13, another section of the same Williams Companies gas transmission pipeline that failed on May 1, 2003, failed in Lewis County, Washington. There was no fire this time. Gas flowed for three hours before being shut off. Gas pressure had already been reduced 20% on

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this pipeline after the May 1 explosion. External corrosion and stress corrosion cracking were seen in this failed area of pipe.[71]

2004[edit]

- On January 25, a TEPPCO 8-inch propane pipeline failed, near Davenport, New York. The propane ignited, destroying a trailer house, and forcing evacuations. About 5,000 barrels of propane were burned. There were no injuries. The incident resulted from a through-wall failure of the pipe material at a fitting that was attached to the top of the pipe.[81][82]
- On March 12, a TEPPCO pipeline spilled about 500 barrels of unleaded gasoline spilled into the Moro Creek, which flows into the Sabine River near Kingsland, Arkansas. The cause was corrosion of a 1/2-inch bleeder line, that was part of a 20-inch pipeline block valve used to equalize pressure across the valve.[46]
- On April 28, a petroleum pipeline of Kinder Morgan Energy Partners ruptured, and spilled an estimated 103,000 gallons of Diesel fuel into marshes, adjacent to Suisun Bay, in Northern California. The line failed from external cossorosion. The company failed to notify California authorities about the spill for 18 hours, a failure for which it was later cited.[23][83][84]
- On May 23, a leak in a sampling tube on a pipeline in Renton, Washington spilled several thousand gallons of gasoline, which ignited.[85]
- On August 19, a series of explosions starting hit an underground natural gas storage cavern in Moss Bluff, Texas, resulting in evacuations for a 3-mile radius. The first blast, about 4 a.m., sent flames 150 to 200 feet into the air. The second explosion was seen as far as 20 miles away. Some type of equipment failure was suspected. The cavern had just been expanded using the SMUG (solution mining under gas) process, which permits salt cavern expansion without interrupting gas storage operations. There were no injuries reported.[96]
- On August 21, a natural gas explosion destroyed a residence in DuBois, Pennsylvania. Two residents were killed in this accident. The NTSB determined that the probable cause of the leak, explosion, and fire was the fracture of a defective butt-fusion joint.[97]
- On September 26, a vandal started up a trackhoe at a construction site in New Caney, Texas, and dug into a propylene pipeline. The escaping propylene ignited, causing nearby residents to evacuate. There were no injuries reported.[98]
- On September 27, 2004, near Blair, Nebraska, an ammonia pipeline failed, releasing 193,213 pounds of ammonia, resulting in the hospitalization of one individual and emergency responders evacuated houses within a one-mile circumference of the break. An estimated 1,000 fish were killed along North Creek and in a golf course pond.[99]
- On September 28, a pipeline failed in Hughes County, Oklahoma, spilling an estimated 1,500 barrels (240 m^3) of Diesel fuel.[100]
- In October, crews from Shell Oil Company recovered 100,000 of an oil seawater mix. Hurricane Ivan had damaged a crude oil pipeline off of the Louisiana Coast.[101]
- On October 27, an anhydrous ammonia pipeline ruptured near Kingman, Kansas, and released approximately 4,858 barrels (772.4 m^3) of anhydrous ammonia. Nobody was killed or injured due to the release. The anhydrous ammonia leak killed more than 20,000 fish along a 12.5-mile section of Smoots Creek, including some from threatened species. The pipeline had previous damage to it. The pipeline controller had misinterpreted the leak as other problems with the system operation, causing the leak to go on longer. As a result of this, and another ammonia pipeline leak the month before, the pipeline owner and its two operating companies were later fined $3.65 million.[99][102]
- On November 1, construction crew ruptured a high-pressure gas line in Little Rock, Arkansas, near one of the state's busiest intersections Monday, triggering a fire that melted traffic lights that hung overhead. No one was injured.[103]
- On November 8, a NGL pipeline failed in a housing division in Ivel, Kentucky. The vapor cloud from the leak ignited, seriously burning a Kentucky State Trooper evacuating those living in the

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area. Eight others were injured and five houses were destroyed. The pipeline, only 65 miles (105 km) long, had 11 previous corrosion failures.[104][105]

- On November 9, in Walnut Creek, California, a petroleum pipeline carrying gasoline to San Jose, California, owned and operated by Kinder Morgan Energy Partners (KMEP) was struck by a backhoe used by Mountain Cascade, Inc., a contractor operating in the construction of a water pipeline for the East Bay Municipal Utility District (EBMUD). A large gasoline spill was subsequently ignited, resulting in an explosive fireball that caused the deaths, by burns, of four workers and one supervisor and the severe injury of five others. A Kinder Morgan worker had misread an as-built map, and had incorrectly marked the pipeline's route before the accident.[106]
- On November 21, a 14-inch petroleum products pipeline sprung a leak while it was shipping gasoline in the Mojave Desert. The Calnev Pipeline, owned and operated by the California-Nevada Pipeline Company, a subsidiary of Kinder-Morgan Energy Partners, is the main source of petroleum fuel products for the Las Vegas Valley, Nevada. An 80-foot (24 m) geyser of gasoline was discovered on the next morning, after numerous complaints of a strong gasoline odor along Interstate 15 in northern San Bernardino County, CA.[107][108]
- On December 15, employees were performing maintenance on a propane pipeline near Mantador, North Dakota, when a gasket on the pipeline's valve failed, causing a leak. Nearby resident were evacuated, and a rail line was shut down temporarily. There were no injuries.[108]
- On December 24, as much as 5,000 gallons of crude oil spilled from a ConocoPhillips pipeline south of Laurel, Montana near the Yellowstone River. Hydrogen sulfide gas from the oil could have posed a major danger, but "the wind helped immensely" to dissipate the gas.[110]

2005[edit]

- In January, a Mid-Valley owned and Sunoco operated pipeline ruptured, spilling 260,000 US gallons (980,000 L) of oil into the Kentucky and Ohio rivers. The U.S. Environmental Protection Agency fined the companies $2.5 million for the spill.[111]
- On January 18, an Enbridge pipeline failed from temperature problems, causing a spill of 100 barrels of crude oil in Bay City, Michigan. The pipe was just two years old at the time.[88][112]
- On January 26, a Mid Valley 22-inch pipeline ruptured in Carrollton, Kentucky, spilling about 290,000 gallons of crude oil. Some of the crude entered the Ohio River. The pipe failure was caused by earth movement.[113][114]
- On February 1, an ExxonMobil gasoline pipeline fire forced 43 families from their houses near Allentown, Pennsylvania. The fire burned for over 72 hours. There were no reported injuries.[115][116]
- On or about February 28, 2005, approximately 2,497 barrels of Jet A Kerosene discharged from a 14-inch TEPPCO pipeline, reaching the Big Cow Creek, flowing into the Sabine River, near Newton, Texas. The discharge was caused by the over-tightening of a coupling at a 3/8-inch cooling line at the top of a 14-inch mainline pump.[46]
- On March 16, a crew installing a communications cable nicked a gas distribution pipeline in Moon Township, Pennsylvania. The crew then notified the local One Call center, but, failed to alert first responders. two hours after the nick, gas exploded in a house, burning two teenagers there.[117]
- On April 1, a Kinder Morgan Energy Partners petroleum products pipeline was found to be leaking gasoline, near Truckee, California. Gasoline spread into Summit Creek, then, into Donner Lake. About 300 gallons spilled.[118][119]
- On May 4, a petroleum products pipeline failed near El Dorado, Kansas, spilling about 78,000 gallons of diesel fuel, of which about 46,000 gallons was lost. The pipeline failed from external corrosion.[120][121]
- On May 13, an underground natural gas pipeline exploded near Marshall, Texas, sending a giant fireball into the sky and hurling a 160-foot (49 m) section of pipe onto the grounds of a

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nearby electric power generating plant. Two people were hurt. The OPS concluded that stress corrosion cracking was the culprit.[122]

- On May 13, the 30-inch Seaway Pipeline, operated by TEPPCO at the time, failed in Bryan County, Oklahoma, spilling approximately 898 barrels of crude oil. Oil reached Eastman Creek. The discharge was caused by a 6-inch longitudinal seam split on the pipeline that resulted from a stress crack that may have been induced by conditions occurring during rail transport of the pipe, and enlarged by pressure-cycle-induced stresses over years of operation of the pipeline.[46][123]
- On May 23, a Magellan Pipeline petroleum products pipeline broke near Kansas City, Kansas, spilling gasoline into the nearby Missouri River. About 2,936 barrels of gasoline were spilled, with about 2,400 barrels being lost.[124][125]
- On May 28, a 12-inch (300 mm) Kinder Morgan Energy Partners pipeline ruptured in El Paso, Texas, releasing gasoline.[126]
- On August 11, a bulldozer hit a crude oil pipeline north of Lufkin, Texas. The escaping crude ignited, injuring the bulldozer operator. About 18,500 gallons of crude oil were lost.[127][128]
- On August 18, a leak was detected in an insulating flange along the BP Amoco Whiting to River Rouge pipeline at a monitoring well in Granger, Indiana. Initially, the bolts and nuts were replaced around the flange to mitigate any leaks; on August 25, when supply concerns diminished, the insulating flange was cut out and replaced with a straight section of pipe. Approximately 21 gallons of gasoline were removed from the ground, with no injuries or fatalities. Metallurgical analysis revealed that the fiber ring joint gasket had evidence of a prior leak.[129]
- On August 29 Hurricane Katrina caused a protective levee to fail near Nairn in Plaquemines Parish, Louisiana, causing a Shell 20-inch pipeline to rupture. About 13,400 gallons were spilled, with about 10,500 gallons of this spill reaching the shoreline, and coastal marshes.[130]
- On September 18, a pipeline pumping station employee was killed in Monroe, Ohio, when leaking propane was ignited and exploded by an arcing pump on September 18. Flames reached 300 feet (91 m) high in the following fire.[131]
- On December 6, a natural gas compressor station exploded near Rifle, Colorado, about 200 yards from Interstate 70. There was only one minor injury to a nearby truck driver.[132]
- On December 13, workers removing an underground oil tank in Bergenfield, New Jersey undermined a 1 1/4-inch steel gas pipeline. The gas line later failed, causing an explosion. Three residents of a nearby apartment building were killed. Four other residents and a tank removal worker were injured. Failure to evacuate the apartment building after the gas line ruptured was listed as a contributing factor.[133]

2006[edit]

- On January 13, a pipeline leak near Independence, Kansas spill about 135,000 gallons of petroleum product, of which about 93,000 gallons was lost. The pipeline failed from external corrosion.[134]
- On February 28, a gas compressor station explosion severely burned a worker, and set off a raging fire near De Beque, Colorado. A second explosion at that site soon after caused no injuries.[135]
- The Prudhoe Bay oil spill: On March 2, a surveillance crew discovered a crude oil spill from a BP crude pipeline near North Slope Borough, Alaska. The pipeline failure resulted in a release currently estimated at 5,000 barrels (790 m^3) of processed crude oil, impacting the arctic tundra and covering approximately 2 acres (8,100 m^2) of permafrost. The pipeline's leak detection system was not effective in recognizing and identifying the failure. Failure to run cleaning pigs to remove internal corrosive build up. The failure caused crude oil price to spike throughout the World.[136][137]

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- On March 23, a pipeline failed west of Toledo, Ohio, spilling about 200 barrels (32 m^3) of unleaded gasoline. During the repair work, another smaller nearby leak was also found.[138]
- On April 17, a Plantation Pipeline line experienced a failure in Henrico County, near Richmond, Virginia. The failure resulted in the release of 23,226 gallons of jet fuel in a residential area. The jet fuel sprayed for approximately 14 minutes and the spray traveled the distance of approximately 200 feet (61 m). The jet fuel did not ignite.[139][140]
- On June 27, a Koch Industries pipeline carrying crude oil failed near the town of Little Falls, Minnesota. The pipeline estimated that approximately 3,200 barrels (510 m^3) of crude oil were released. The pipeline failed from previous mechanical damage to the pipeline.[141][142]
- On July 22, a Tennessee Gas Pipeline Company gas transmission pipeline ruptured, resulting in an estimated release of 42,946,000 cu ft (1,216,100 m^3) of natural gas near Clay City in Clark County, Kentucky. The gas ignited, but there were no injuries, and just minor property damage. External corrosion was suspected.[143][144]
- On August 7, a leak from a pump, on a pipeline, released about 241,000 gallons of HVL's, in Jennings, Louisiana.[145][146]
- On August 12, a Kinder Morgan petroleum pipeline failed in Romeoville, Illinois. About 59,000 US gallons (220,000 L) of butane were lost. External corrosion was the cause, but there were no injuries.[147][148]
- On September 8, a leak on a pump on an LPG pipeline in Apex, North Carolina spilled about 12,000 gallons of propane, forcing evacuations.[149]
- On September 29, a crew replacing an old pipeline hit a high pressure gas pipeline in Labette County, Kansas, killing a crewman. Resident with a milre of the incident were evacuated for a time.[150]
- On October 12, a pipeline exploded when a tugboat pushing two barges hit that pipeline Thursday in West Cote Blanche Bay, about two miles (3 km) from shore and 100 miles (160 km) southwest of New Orleans, Louisiana. Four crew members were killed, and two were missing and later presumed dead.[151][152]
- On October 25, an ammonia pipeline failed from corrosion near Clay Center, Kansas, releasing about 4500 barrels of ammonia. two people were injured by the fumes.[153]
- On November 11, a jet-black, 300-acre (1.2 km^2) burn site surrounded the skeletal hulk of a bulldozer that struck a natural-gas pipeline during construction of another pipeline, and produced a powerful explosion near Cheyenne, Wyoming. The bulldozer operator was killed. The company building the new pipeline was fined $2.3 million for failing to obtain a locate on the other pipeline.[154][155]
- On or about November 27, 2006, approximately 97 barrels of gasoline were discharged from a portion of Plantation Pipeline in Mecklenburg County, North Carolina, into Paw Creek and its adjoining shorelines. The leak resulted from a failed gasket on an above-ground block valve.[1]
- **2006 Falk Corporation explosion**: Leaks in a Milwaukee, Wisconsin propane pipe running below an apartment building caused an explosion. Three people were killed and forty-seven others injured.
- On December 19, a lineman for Midwest Energy hit a natural gas transmission pipeline near Mason, Michigan. The lineman was killed in the following explosion and fire.[156][157]
- On December 24, a Plains All American Pipeline ruptured, spilling about 23,856 gallons of crude oil in the Gulf of Mexico, about 30 miles southeast of Galveston, Texas.[158][159]

2007[edit]

- On January 1, an Enbridge pipeline that runs from Superior, Wisconsin to near Whitewater, Wisconsin failed, resulting in a spill of 1,500 barrels of crude oil onto farmland and into a drainage ditch. Incomplete fusion of a longitudinal weld at the pipe maker that failed as pressure cycle was established as the cause.[160][161]

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- On February 2, a construction crew struck an Enbridge pipeline in Rusk County, Wisconsin with equipment, spilling 4,800 barrels (760 m^3) of crude oil, of which only 2,066 barrels were recovered.[162] Some of the oil filled a hole more than 20 feet (6.1 m) deep and was reported to have contaminated the local water table.[163]
- On February 17, in a rural area of Harris County, Texas, a Tennessee Gas Pipeline transmission pipeline was damaged, and later exploded and burned. Grass fires spread across a three-square mile rural area.[164] The 31-inch natural gas pipeline leaked after a bulldozer hit it. Residents reported a loud explosion that shook houses enough to set off car alarms, as well as a rumbling sound and a bright orange fireball in the sky. Firefighters "backfilled" the break with nitrogen.[165] PHMSA reported 1 person injured.[166]
- On March 29, near Yutan, Nebraska, a pipeline was hit by construction equipment. About 1,697 barrels of natural gasoline were lost.[167][168]
- On April 27, a 22-inch gas transmission pipeline failed near Pawnee, Illinois. The failure ejected a 109 inch long section of pipe, and, releasing 38 mmcf of natural gas that ignited. The rupture and resulting fire required the evacuation of a residence and the death of farm animals. The failure was due to external corrosion.[169]
- On May 4, a backhoe helping to lay a gas pipeline hit another gas pipeline in Weatherford, Texas. The gas ignited, sending flames hundreds of feet into the air. Vehicles, equipment, and power lines in the area were destroyed, but, there were no injuries.[170]
- On May 16, about 63,000 US gallons (240,000 L) of gasoline spilled into an old stripping pit that covers a three-acre area in Coal Township, Pennsylvania. The Kerris and Helfrick company owns the property where the gas leak occurred, and the excavator, was working for the company when he accidentally ruptured the Sunoco Logistics 14-inch petroleum pipeline. The gasoline was mostly absorbed into areas of soil, fill and coal strippings at the site.[171] Several residents made U.S. Rep. Christopher P. Carney aware of complaints about gasoline odors in residential basements. "Moreover, many residents are legitimately concerned about groundwater contamination as well as a host of future problems associated with the spill", Carney wrote to Department of Environmental Protection Secretary Kathleen McGinty.[*citation needed*] The pipeline was installed in 1964 by the Atlantic Richfield Co.(ARCO) and purchased in 1990 by Sunoco. On September 29, the PADEP Environmental Cleanup program finalized a consent order and agreement with Mallard Contracting, which included a $45,000 civil penalty covering both DEP's response costs and a fine for violations of the Pa. Solid Waste Management Act.[172]
- on July 18, 2007 New York City steam explosion|New York city steam pipoeline exploded]].
- In August, a gas compressor turbine caught fire inside BP's Gathering Center 1 in Alaska, after an oil hose ruptured and spewed flammable liquid across the motor. A mechanic on patrol in the facility — seeing smoke — fled the room as the turbine burst into flames. Automatic fire and gas alarms were never triggered. A subsequent investigation by Alaska state authorities found that a ruptured hydraulic oil hose was Jerry-rigged in a position that chaffed against the turbine's hot engine. The investigation also found that the facility's fire and gas detectors were not powered on at the time.[173]
- On October 8, a gas pipeline at a gas storage facility in Salem, Michigan ruptured and caught fire. Siding was melted on nearby houses.[174]
- On October 18, an ethylene pipeline explosion early, was heard for miles around Port Arthur, Texas, waking residents. The following fire spread to a nearby butadiene pipeline, causing it to rupture and burn. Later, over 300 residents sued the pipeline's owners for health issues claimed to be caused from the chemicals released by the accident. External corrosion of the ethylene pipeline caused the first pipeline failure.[175][176]
- On November 1, a 12-inch propane pipeline exploded, killing two people, and injuring five others, near Carmichael in the southeast portion of Clarke County, Mississippi. The NTSB determined the probable cause was an LF-ERW seam failure. During hydrostatic testing of the pipeline after repair, another LF-ERW seam failed nearby. Inadequate education of residents

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near the pipeline about the existence of this pipeline, and how to respond to a pipeline accident, were also cited as a factors in the deaths.[177]

- On November 12, three teenaged boys drilled into an ammonia pipeline, in Tampa Bay, Florida, causing a major ammonia leak. They later claimed they did it due to stories of money being hidden inside that pipeline. The leak took two days to be capped. One of the teens had serious chemical burns from the ammonia. Residents within a half miles from the leak were evacuated. PHMSA later noted the pipeline company failed to adequately plan for emergencies with the local Fire Agency, as required by CFR 195.402(c)(12).[178]
- On November 13, Enbridge discovered a leak on their 34-inch Line 3, at Mile Post 912, near Clearbrook, Minnesota. Later, the pipeline exploded during repairs, on November 27, causing the deaths of two employees. DOT officials said that two Enbridge workers died in a crude oil explosion as they worked to make repairs on the former Lakehead system pipeline. Enbridge was cited for failing to safely and adequately perform maintenance and repair activities, clear the designated work area from possible sources of ignition, and hire properly trained and qualified workers.[179][180]
- On November 21, a 30-inch gas transmission pipeline failed, near Haven, Kansas. The gas ignited, resulting in road closures.[169]
- On December 14, two men were driving east in a pickup truck, on Interstate 20, Near Delhi, Louisiana, when a 30-inch gas transmission pipeline exploded. One of the men were killed, and the other injured. External corrosion was later identified as the cause of the failure.[181][182]

2008[edit]

- On January 5, 2008, a pipeline ruptured at a filet weld, leaking natural gasoline in Oologah, Oklahoma. About 45,000 gallons of the gasoline was spill, with about 29,000 gallons being lost.[183]
- On January 7, a pipeline split open, near Denver City, Texas, spilling 1.3 million US gallons (4,900 m^3) of crude oil. The pipeline company failed to detect and stop the leak for more than 24 hours. ERW seam failure appears to be the cause.[184][185]
- On January 11, a Belle Fourche maintenance crew damaged its own pipeline, spill about 11,100 gallons of crude in Alexander, North Dakota.[186]
- On February 5, a natural gas pipeline compressor station exploded and caught fire, near Hartsville, Tennessee, and was believed to have been caused by a tornado hitting the facility.[187]
- On February 15, a 20-inch distillate pipeline exploded and burned in Hidalgo County, Texas, closing road FM490.[188]
- On March 14, a house in a Columbia, Missouri neighborhood exploded in an explosion that could be felt for miles, causing fatal injuries to the elderly couple living there. Problems with the gas distribution line there were blamed for the explosion. Another house nearby also suffered damage.[189]
- On May 16, a crew boring to install a new gas main hit an existing 4-inch gas line in McKinney, Texas. Escaping gas caused two houses to explode, and one other house to catch fire. Three people were burned from this incident.[190]
- On July 28, the U.S. District Court for the Southern District of Illinois ordered Apex Oil Company Inc., to clean up ground water and soil contamination, at an expected cost of at least $150 million. During the period 1967 through 1988, Apex Oil's legal predecessor, Clark Oil and Refining Corp., released gasoline from leaking pipelines and other spills, that commingled with other responsible parties' releases and resulted in the large plume of refined petroleum substances beneath Hartford, Illinois. Vapors from the underground plume of millions of gallons of leaked and spilled petroleum products have migrated into houses in the village, causing years of fires, explosions, and evacuations.[191]

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- On August 10, a 20-inch crude oil pipeline ruptured near Golden Gate, Illinois. About 243,000 gallons of crude were spilled, with about 33,000 gallons being lost. The cause was listed as a pipe seam failure.[192][193][194]
- On August 25, a 24-inch gas transmission pipeline failed in a rural area west of Pilot Grove, Missouri. The longitudinal rupture in the pipe body created a 50 foot by 33-foot by 7-foot deep crater in the ground. The cause of the rupture was external corrosion.[189]
- On August 28, a 36-inch gas pipeline failed near Stairtown, Texas, causing a fire with flames 400 feet (120 m) tall. The failure was caused by external corrosion.[195][196]
- On August 29, a 24-inch gas transmission pipeline ruptured in Cooper County, Missouri. Corrosion had caused the pipeline to lose 75% of its wall thickness in the failure area.[197]
- On September 9, workers constructing a new pipeline hit an existing natural gas pipeline in Wheeler County, Texas. Two workers were burned by this accident.[198]
- On September 14, a 30-inch Williams Companies gas pipeline ruptured and gas ignited near Appomattox, Virginia. Two houses were destroyed by the fire. External corrosion was the cause of the failure.[199][200]
- On September 23, a ruptured pipeline causes a fire at a Pipeline Terminal in Pasadena, Texas. One worker was killed, and another injured, with about 190,000 US gallons (720,000 L) of product being lost. The failure was caused by internal corrosion.[201][202]
- On October 3, a crew working on a Turnpike expansion drill into a Colonial Pipeline petroleum products pipeline, in Hamilton, New Jersey. About 35,000 gallons of Diesel fuel were spilled, with 100 gallons not recovered.[203][204]
- On October 3, construction equipment hit a Mid Valley Pipeline Company pipeline in Florence, Kentucky, spilling 3,650 barrels of crude oil.[205]
- On the night of November 15, a gas compressor for a pipeline at an entry exploded and burned near Godley, Texas. The fire spread to another company's gas compressor station next to it. A 24-inch gas pipeline had to be shut down to stop the fire. There were no injuries, and damages were estimated at $2 million.[206]
- On November 25, a gasoline release from a Sunoco petroleum pipeline occurred, near a retail mall in Murrysville, Pennsylvania. Officials said the release occurred from the 6-inch line at about 9:30 a.m. while a Sunoco Logistics crew was working on a ball valve. It was suspected the ball valve was improperly installed. The failure resulted in the evacuation of numerous stores, restaurants and roads in the immediate vicinity due to the dousing of gasoline and subsequent vapors emitting from the 11,760 US gallons (44,500 L) of spilled product.[207]
- On December 5, a driver of a vehicle went off of a road, and struck a valve on an AMOCO gasoline pipeline in Colon, Michigan. The driver was killed, and, the fire burned for several days. About 14,000 gallons of gasoline were burned, or lost.[208][209]

2009[edit]

- On January 4, 2009, a 6.625-inch storage well line operated by Columbia Gas Transmission Company 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.[210]
- On January 15, an accidental massive gas release at Pump Station 1 of the trans-Alaskan pipeline by Alyeska Pipeline Service Company 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 BP 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,

IND 821-1 cont'd

and rushed to Pump Station 1, a key asset through which every drop of oil coming off the North Slope must pass.[211]

- On February 1, a gas pipeline explosion rocked the area 2 miles (3.2 km) east of Carthage, Texas.[212]
- On February 11, a pipeline exploded and ignited near a natural gas treatment plant, near Carthage, Texas. There were no injuries.[213]
- 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.[214] 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 m^3) of crude oil into a farm field. Eventually, 782 of the 1,250 barrels (199 m^3) released were recovered. Some of the crude oil, approximately 200 barrels (32 m^3), did contaminate a local creek. There were no fatalities, or injuries.[215][216]
- On May 4, Kinder Morgan's Florida Gas Transmission pipeline 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.[217]
- 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. No injuries reported.[168][218]
- 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.[219][220]
- On July 15, an explosion occurred at Kinder Morgan's Midcontinent Express pipeline 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. There was no fire.[221] The workers were "literally right on top" of the explosion; their injuries were caused by pressure, not heat. One worker was injured when part of the pipe fell on him. The explosion snapped and bent a pipeline connected to a massive separator unit which was slung several yards.[222]
- On August 10, operators of a Belle Fourche pipeline incorrectly operated the line, causing it to fail, near Edgerton, Wyoming. About 30,000 gallons of crude oil were spill, with about 1,200 gallons being lost.[134]
- On August 17, a pipeline was found leaking by an aerial patrol in Atoka County, Oklahoma. 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.[223]
- On October 7, a leaking pipeline carrying jet fuel was accidentally ignited by a pipeline repair crew in Upton County, Texas.[224]
- On October 28, Kinder Morgan's Natural Gas Pipeline Company of America 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.[225]

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- On November 5, two people were hurt when an El Paso Natural Gas 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. About 200 residents in the area were evacuated. Bushland is in Potter County, about 15 miles (24 km) west of Amarillo. The failure was in an abandoned tap, but the exact failure reason remains unknown. The explosion cause $436,136 in property damage.[226][227][228][229]
- On November 14, a fire at a gas compressor station near Cameron, West Virginia slightly burned one employee, and causes $5.6 million of damage to the facility.[230]
- 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.[231][232]
- 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 on December 3 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.[233][234][235]
- On December 23, a crude oil pipeline started leaking in Galveston, Texas. There was no fire or explosion as a result of the accident, and an estimated 120 barrels (19 m^3) of crude oil were released to the environment.[236]

2010s[edit]

2010[edit]

- On January 2, Enbridge's Line 2 ruptured near Neche, North Dakota, releasing about 3,784 barrels of crude oil, of which 2,237 barrels of were recovered. The cause was a material defect.[237][238]
- On January 7, a gas pipeline exploded near Barksdale Air Force Base, Louisiana, in January, killing a pipeline employee.[239]
- On February 1, a plumber trying to unclog a sewer line in St. Paul, Minnesota ruptured a gas service line that has been "cross bored" through the house's sewer line. The plumber and resident escape the house moments before as an explosion and following fire destroyed the house. The Minnesota Office of Pipeline Safety ordered that gas utility, Xcel, to check for more cross bored gas lines. In the following year, 25,000 sewer lines inspected showed 57 other cross bored gas lines. In Louisville, Kentucky, 430 gas line cross bores were found in 200 miles (320 km) of a sewer project, including some near schools and a hospital. The NTSB had cited such cross bore incidents as a known hazard since 1976.[240][241]
- On February 25, a natural gas liquids (NGL) pipeline ruptured near Pond Creek, Oklahoma, releasing over 575,000 US gallons (2,180,000 L) of NGL's, and forcing road closures. There was no fire.[242][243]
- On March 1, at about 8:10 am, Mid-Valley Pipeline 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 and 196 barrels were recovered from the secondary containment area within Mid-Valley's site.[244]
- On March 15, a 24-inch gas pipeline burst, but did not ignite near Pampa, Texas.[245]
- 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 refinery in Philadelphia, Pennsylvania. The area was under the control of the Operator in a fenced off area that is off-limits to the public.[246]
- On April 5, a crude oil pipeline ruptured near Green River, Wyoming. At least 84,000 US gallons (320,000 L) of crude were spilled. Corrosion in the pipeline was the cause.[29]

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- On April 17 Enbridge discovered a leak on the 26-inch Line 2 near Deer River, Minnesota. 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 were lost.[168]
- On May 29, a Amoco pipeline leaked nearly 89,000 gallons of gasoline into a farm field. The leak occurred in Constantine Township, St. Joseph County, Michigan. The cause was from a manufacturing defect in the pipe.[209]
- On June 7, a 36-inch gas pipeline explosion and fire in Johnson County, Texas, 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.[247][248]
- On June 8, construction workers hit an unmarked 14-inch gas gathering pipeline near Darrouzett, Texas. Two workers were killed.[247][249]
- The Red Butte Creek oil spill. On June 12, a Chevron crude oil pipeline, damage by lightning, ruptured, causing 800 barrels (130 m^3) of crude to spill into Red Butte Creek in Salt Lake City, Utah. Crude then flowed into a pond in Liberty Park.[250]
- On July 5, a landowner operating a bulldozer hit an 8-inch LPG/propane pipeline near Thomson, Georgia. Later, the propane fumes ignited, killing the adult son of the landowner, and igniting fires that destroyed a trailer house and woodlands.[261]
- 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. Enbridge had numerous alarms from the affected Line 6B, but controllers thought the alarms were from phase separation, and 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,[252][253] whereas EPA reports over 1,139,569 gallons of oil have been recovered as of November 2011.[254] On July 27, 2010, an Administrative Order was issued by U.S. EPA requiring the performance of removal actions in connection with the facility. The Order requires Enbridge to immediately conduct removal of a discharge or to mitigate or prevent a substantial threat of a discharge of oil and to submit a Work Plan for the cleanup activities that was to include a Health and Safety Plan,[255] as required by 29 CFR 1910.120 (HAZWOPER). In 2012, the NTSB later cited known but unrepaired cracks and external corrosion as the cause.[256]
- On August 10, the U.S. Environmental Protection Agency (EPA) and the Justice Department announced that Plains All American Pipeline and 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, and requires the company to pay a $3.25 million civil penalty.[257]
- 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.[208][258]
- On August 25, a construction crew installing a gas pipeline in Roberts County, Texas hit an unmarked pipeline, seriously burning one man.[259]
- On August 24, a gas compressor station in Shongaloo, Louisiana injured one worker.[260]
- On August 27, a LPG pipeline sprang a leak in Gilboa, New York, forcing the evacuation of 23 people. The cause was stress corrosion cracking. There were no injuries or ignition.[261][262][263]
- 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.

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- On September 9, 2010 a high pressure gas pipeline exploded in San Bruno, California, a suburb of San Francisco. The blast destroyed 38 houses and damaged 120 houses. Eight people died and many were injured. Ten acres of brush also burned. Later, PG&E was unable to supply the California Public Utilities Commission with documents on how PG&E established pressure limits on some of its gas transmission pipelines. It was also revealed that this pipeline had 26 leaks between Milpitas and San Francisco during the time of 1951 to 2009, with some of the leak causes listed in records as "unknown". Later hydrostatic testing of the same pipeline that failed found a pinhole leak, and a previously damaged section blew out.[264][265][266][267][268]
- On September 9, a 20-inch diameter Columbia Gas Transmission Company pipeline failed in Lawrence County, Kentucky. While there was no fire or evacuations, the condition of this uncoated, non-cathodic protected, unknown grade pipeline caused PHMSA to enter into a Consent Order to eventually replace this pipeline.<r[269]
- On September 28, a repair crew was working on a corroded gas pipe in Cairo, Georgia, when the line exploded. One crew member was killed, and three others burned.[270]
- On October 15, a gas pipeline under construction in Grand Prairie, Texas was running a cleaning pig without a pig "trap" at the end of the pipe. The 150 pound pig was expelled from the pipeline with enough force to fly 500 feet (150 m), and crash through the side of a house. No one was injured.[271]
- On November 12, three men working on natural gas lines were injured when a pipeline ruptured in Monroe, Louisiana.[272]
- On November 30, a Tennessee Gas Pipeline 30-inch gas pipeline failed at Natchitoches, Louisiana. There was no fire, but the pipeline had a Magnetic Flux smart pig test earlier in the year that indicated no flaws in the pipeline. The failure was at a crack in a wrinkle bend. The deadly 1965 gas pipeline accident had occurred on a different pipeline owned by the same company nearby.[273]
- On December 1, a valve on a crude oil pipeline leaked about 500 barrels (79 m^3) of crude in Salt Lake City, Utah. This failure was only 100 yards from a June 2010 failure on the same pipeline.[274]
- On December 2, a pipeline was discovered leaking gasoline near Livingston, Illinois.[275]
- On December 8, at East Bernard, Texas, 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 micro-biologically induced due to moisture in the pipe.[276]
- On December 17, a gas line fire and explosion just outside Corpus Christi, Texas city limits leaves one person critically injured. A man was working on removing an abandoned pipeline when it exploded, and the man's face was severely burned.[277]
- 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.[278]
- On December 28, a pipeline at an underground gas storage facility in Covington County, Mississippi, forcing the evacuation of about two-dozen families for over a week.[279]

2011[edit]

- On January 11, personnel from Millennium Pipeline noticed that a gas transmission pipeline was leaking in Tioga County, New York. This 30-inch diameter pipeline was built in 2008. A pinhole in a rejected girth weld was found to be the cause of the failure. It appears that during the course of the construction project for the line, the subject pipe section was inadvertently picked up and subsequently installed in the pipeline. PHMSA ordered testing of this pipeline for similar flaws.[280][281]

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- A 12-inch cast iron gas main leaking in Philadelphia explodes, killing a repair crew member and injuring six others on January 18.[282][283]
- Multiple gas pressure regulators failed, and caused a gas pressure surge in Fairport Harbor, Ohio, on January 24, causing gas fires in 11 houses, and one apartment. 150 gas appliances were damaged or destroyed, but there were no injuries. Gas company Dominion East Ohio says it found fluids and debris in a failed regulator. A year after the explosion, the Public Utilities Commission of Ohio recommended a $500,000 fine for Dominion.[284][285][286][287]
- Five people were killed, and eight houses were destroyed, in a gas explosion and fire in Allentown, Pennsylvania on February 9. The NTSB had warned UGI about cast iron gas mains needing replacement after the 1990 gas explosion in that city. Between 1976 and the date of the letter, July 10, 1992, two more gas explosions occurred. Three people were killed, 23 injured and 11 houses were destroyed or damaged in those explosions. UGI was cited in 2012 for several safety violations, including a lack of valves on their gas system.[288][288][290][291]
- Late on February 10, a Tennessee Gas Pipeline 36-inch gas transmission pipeline exploded and burned near Lisbon, Ohio. No injuries resulted. The cause was from stress on a girth weld on the pipeline. A failure on another girth weld on the pipeline system led to a PHMSA Consent Agreement.[292][293][294]
- Early on February 24, a pipeline near Texas City, Texas ruptured, sending up to 5,000 US gallons (19,000 L) of gasoline into Bayou Pierre.[295][296]
- On March 1, a Tennessee Gas Pipeline gas transmission pipeline failed near Cumberland, Ohio. A material or weld defect was the cause.[297][298]
- Early on March 17, a 20-inch steel CenterPoint Energy natural gas line running through a Minneapolis, Minnesota neighborhood ruptured, and gas from it ignited, caused evacuations to buildings nearby, and Interstate 35W was closed from downtown Minneapolis to Highway 62. There were no injuries. The Minnesota Office of Pipeline Safety later found the pipe there was not designed to handle the load of soil and passing cars, and efforts to shore up the pipeline were incorrectly carried out.[299][300][301]
- A farmer and rancher near White Oak Township, Michigan smelled gasoline on April 13, and discovered gasoline from a products pipeline leaking into a drainage ditch. As of late September, an estimated 460,000 gallons of gasoline had been released, with about 111,000 gallons of it recovered.[302]
- On May 7, a threaded connection failed on a Keystone Pipeline pump at a station in Sargent County, North Dakota, spilling about 400 barrels of crude oil. Due to a number of other leaks on this pipeline system, Keystone's owner, TransCanada Corporation, was given a Corrective Action Order by PHMSA.[303]
- An 8-inch NGL pipeline failed in Romeoville, Illinois on May 14, leaking about 4200 gallons of butane. Corrosion inside a casing under a road was the cause of the failure. Corrosion only 2.5 feet from the failure had been seen by a smart pig run in 2007, but was not within action limits at the time.[304]
- On May 19, a 10-inch crude oil pipeline ruptured near Maysville, Oklahoma. Over 42,000 US gallons (160,000 L) of crude were lost. There was no fire. Internal pipeline corrosion was the cause.[305][306]
- A 2-inch lateral on a crude oil pipeline rupture in Huntington Beach, California on July 1. A major road, Goldenwest Street, had to be closed for cleaning and pipeline repairs.[307]
- Late on July 1, a 12-inch Exxon Mobil crude oil pipeline. also known as the Silvertip Pipeline, ruptured, and spilled about 63,000 gallons of oil into the Yellowstone River in south-central Montana. There was confusion in the pipeline control room, causing a delayed pipeline shutdown. Some residents of Laurel, Montana had to be evacuated.[308][309] The break near Billings fouled the riverbank and forced municipalities and irrigation districts to close intakes.[310][311] Exxon later increased the spill size estimate to 1500 barrels in January 2012 after seeing the damage to the pipeline.[312] About 140 people were evacuated starting about 12:15 a.m. Saturday due to concerns about possible explosions and the overpowering fumes. All

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were allowed to return after instruments showed petroleum odors had decreased,[313] although no information was available regarding the concentrations of benzene in air. Speculation involves high water flow in the Yellowstone River may have scoured the river bed and exposed the pipe. Consequently, with three oil refineries are located in the Billings area, the fire chief for the city of Laurel said he asked all three to turn off the flow of oil in their pipelines under the river after the leak was reported. Exxon Mobil and Cenex Harvest Refinery did so, and that Conoco Phillips said its pipe was already shutdown.[313] Cenex had a release into the Yellowstone River in September 2002. Exxon Mobil later announced the cleanup would cost $135 million. In 2015, Exxon Mobil was fined $1 million by PHMSA for this incident.[314][315][316][317]

- On July 20, a six-month-old, 30-inch natural gas pipeline exploded near Gillette, Wyoming, creating a 60-foot (18 m) crater. There was no fire, nor any injuries. Construction or installation issues caused the failure.[318][319]
- A pipeline carrying jet fuel ruptured in Mango, Florida on July 22. About 31,500 US gallons (119,000 L) of fuel spilled. There was no fire or injuries.[320]
- On August 13, an 8-inch NGL pipeline ruptured near Onawa, Iowa at a Missouri River crossing, during flooding conditions. About 818 barrels of Natural Gasoline was lost. There were no evacuations or injuries, but two other pipelines in the same right of way were forced to shut down.[321][322][323][324]
- On August 17, Kinder Morgan's Natural Gas Pipeline Company of America had a flash fire and explosion at a plant south of Herscher, Illinois. Five employees went to the hospital. Kinder Morgan was later cited for pipeline and workplace safety violations.[325][326]
- A pipeline carrying heating oil was hit by construction workers in East Providence, Rhode Island on August 31, spraying oil on roofs, trees, and pavement, and flowed into storm drains. At least 56,000 US gallons (210,000 L) of oil were spilled.[327]
- A Cupertino, California condominium was gutted August 31, after a plastic pipeline fitting cracked, filling the garage with natural gas that exploded just minutes after the owner left for lunch. PG&E later found six other plastic pipe failures near the blast site. The line was an especially problematic type of pipe manufactured by DuPont called Aldyl-A. PG&E has 1,231 miles (1,981 km) of the early-1970s-vintage pipe in its system. Federal regulators singled out pre-1973 Aldyl-A starting in 2002 as being at risk of failing because of premature cracking. Explosions caused by failed Aldyl-A and other types of plastic pipe have killed more than 50 people in the United States since 1971, the federal government says.[328]
- A 10-inch LPG pipeline failed on September 8 in Mitchell County, Texas. The escaping gas ignited, starting a small brush fire. The cause of the failure was a crack in the weld of a repair sleeve from bending and heat hardening. There were no injuries.[329]
- On September 20, a farmer digging to lay drainage tile hit a 10-inch gasoline pipeline near Aurelius, New York, spilling about 3,300 US gallons (12 m^3) of gasoline. There was no fire or injuries.[330]
- A 2-inch crude oil gathering pipeline failed in Oklahoma on October 12, spilling about 120 barrels of oil. There were no injuries or fire from the failure.[331]
- Early on November 3, an explosion and fire hit a gas Columbia Gas Transmission pipeline compressor station at Artemas in Mann Township, Bedford County, Pennsylvania. There were no injuries. The cause was internal corrosion.[332][333]
- On November 8, a contractor for Vectren Corp. working on a bare gas main replacement project broke a "short stub" on the main, then failed to notify New Albany, Indiana authorities about the leak. Gas migrated through the soil, and built up in a nearby house, then exploded. Five people had to be hospitalized.[334]
- A crew working on a waterline hit a gas distribution pipeline in Fairborn, Ohio on November 12, leading to a gas explosion that killed one man, and injured five others, including children.[335]
- On November 16, a Tennessee Gas Pipeline 36-inch gas transmission pipeline exploded and burned near Glouster, Ohio. Two people were injured, with three houses and a barn destroyed,

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and a barn damaged. The pipeline failed at a girth weld, with landsliding causing more stress on the weld.[336][337]

- Late on November 21, a Tennessee Gas Pipeline 24-inch gas transmission pipeline exploded and burned near Batesville, Mississippi. Twenty houses were evacuated for a time, but there were no injuries or major property damage. The pipeline failed at a sleeve over a wrinkle bend installed in 1946.[338]
- On December 3, a Williams Companies gas transmission pipeline exploded and burned in Marengo County, Alabama. A 47-foot section of the pipe was hurled more than 200 feet from the failure area. The gas burned for several hours, and a nearby pipeline was damaged. There were no injuries, or serious property damage. External corrosion was the cause of the failure, due to issues with the pipeline coating, the cathodic protection level, and the local soil corrosiveness.[339][340][341]
- On December 6, explosions and fire erupted at a natural gas pipeline compressor station in Sublette County, Wyoming. Two workers were injured.[342]
- On December 10, a landowner using a bulldozer hit an 8-inch and a 12-inch petroleum pipelines near Nemaha, Nebraska, rupturing both lines. The spill size was estimated to be 119,000 gallons of gasoline, jet fuel, and Diesel fuel. Some of the fuels flowed into a creek leading into Jasper Creek. There were questions about the depth of soil coverage for this pipeline.[343][344][345]
- A 42-inch natural gas transmission pipeline failed and ignited at a valve on December 10 in Cache County, Utah.[346][347]
- On December 27, controllers for Enterprise Pipeline received an alarm, for a leak on an LPG pipeline. The leak location was found in Loving County, Texas. Repair crew excavated the area, and found a full girth weld failure. During the pipeline repair, a flash fire involving residual pipeline product in the soil occurred, injuring 3 employees, one of whom required in-patient hospitalization. The rupture was attributed to the complete circumferential separation of an acetylene girth weld dating to 1928, and the flash fire was attributed to operator error.[348]

2012[edit]

- A 30-inch gas pipeline exploded and burned, in Estill County, Kentucky, on the evening of January 2. The rupture created a crater approximately 86 feet long by 22 feet wide, and expelled a number of pieces of pipe as far as 800 feet from the rupture center. Flames were reported reaching over 1,000 feet high. Residents up to a mile away from the failure were evacuated. There were no injuries. The cause was overstress from land movement.[349][350]
- A forest fire caused a gas pipeline to explode and burn in Floyd County, Kentucky on January 7. There were no injuries from this incident.[351]
- On January 9, a man was killed, and another person injured, in a fiery house explosion from a leaking 4-inch cast iron gas main installed in 1950 in Austin, Texas. Gas had been smelled in the area for several weeks prior to this. Gas company crews had looked along the affected property for a leak, but were unable to find it.[283][352]
- A Sunoco pipeline ruptured and spilled about 117,000 gallons of gasoline, in Wellington, Ohio, late on January 12. Some residents were evacuated for a week.[353][354]
- On January 13, an 8-inch gas pipeline exploded and burned, in a vacant agricultural field, in Rio Vista, California. There were no injuries or evacuations.[355]
- A Tennessee Gas Pipeline gas compressor had a major leak "that sounded like a rocket" in Powell County, Kentucky, forcing evacuations of nearby residents on January 14. There was no fire or injuries reported.[356]
- A contractor excavating for a communications company caused a massive gas explosion and fire at a condominium complex on January 16 in West Haverstraw, New York, injuring two firefighters and two utility workers. Afterwards, it was found that the excavator's insurance will be insufficient to cover all of the property damage of the incident.[357]

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- On January 18, the original Colonial Pipeline mainline failed in Belton, South Carolina, spilling about 13,500 gallons of petroleum product. The failure was caused by internal corrosion.[359]
- Workers in Topeka, Kansas were installing a yard sprinkler system on January 30, hit a gas line. Gas from the leak later on exploded in a nearby house, burning a 73-year-old woman, who died several weeks later.[359][360]
- On January 31, a Shell Oil Company fuel pipeline to the Milwaukee, Wisconsin Mitchell International Airport was found to be leaking. Jet fuel had been smelled for about two weeks in the area, and was found in runoff water in the area. The cause was from external corrosion. About 9,000 gallons of fuel were spilled. In 2014, a Shell employee was scheduled to plead guilty to charges of falsifying records of the pipeline.[361][362]
- A Florida Gas Transmission Company 30-inch gas transmission pipeline burst near Baton Rouge, Louisiana on February 13. Residents in the area were evacuated for a time, but there was no fire.[363][364]
- On February 15, 2012, in Arenac County, Michigan, oil was discovered in the soil around a 30-inch Enbridge crude oil pipeline. About 800 gallons of crude oil was spilled.[365]
- Two cars that were drag racing went off the road they were on, and crash through a fence and into a crude oil pipeline in New Lenox, Illinois on March 3. The pipeline was ruptured, and the crude oil ignited. Two men from the vehicles were killed, and three others seriously burned.[366][367]
- On March 5, a leak at an Enid, Oklahoma pipeline storage facility spread propane fumes in the area, forcing evacuations. There was no fire or explosion.[368]
- A crude oil pipeline leaked near Grand Isle, Louisiana on March 17, spilling as much as 8,400 gallons of crude oil. There were no injuries reported.[369]
- On March 29, an employee accidentally left a valve open during maintenance work on a Williams Companies gas compressor station near Springville Township, Pennsylvania. Later, gas leaked through the valve, causing alarms to evacuate workers in the compressor building. Later, the gas exploded and burned. There were no injuries. It was also found there are no agencies enforcing rules on rural gas facilities in that state.[370][371]
- On April 2, Transcontinental Gas Pipeline Company, reported a leak on their 72nd Street Interstate Transmission Lateral located in North Bergen, New Jersey. Workers discovered a rock in contact with the bottom of the pipe. Upon removing the rock, the pipeline began to leak. There was no fire or injuries reported as a result of this incident.[372]
- A 12-inch gas pipeline exploded and burned for five hours near Gary, Texas on April 4. There were no injuries, but the rupture site was only 200 feet from that pipeline's compressor station.[373]
- On April 6, two gas company workers were mildly burned when attempting to fix a leak on a 4-inch gas pipeline in DeSoto County, Mississippi. The pipeline exploded and burned during the repairs.[374]
- A gas pipeline exploded and burned in Terrebonne Parish, Louisiana, on April 9. The accident was reported first by a satellite monitoring the area to the NRC. There were no injuries.[375]
- Two men escaped with only minor burns after a bulldozer they were using hit a 24-inch gas pipeline near Hinton, Iowa on April 25. Authorities later announced the men did not call 811 for an underground utility locate.[376]
- On April 28, an ExxonMobil 20/22-inch-diameter pipeline ruptured near Torbert in Pointe Coupee Parish, Louisiana, about 20 miles west of Baton Rouge, and crude oil spilled into the surrounding area, and flowed into an unnamed tributary connected to Bayou Cholpe. About 117,000 gallons of crude were spilled, with about 37,000 gallons being lost. The pipeline failed due to a manufacturing defect.[377][378][379]
- A 26-inch gas transmission pipeline ruptured on June 6 in a compressor station near Laketon in northeastern Gray County, Texas. Gas escaped from the 50-foot-long rupture, igniting, leaving a crater 30 feet in diameter, burning two acres of agricultural area and telephone poles. There were no injuries.[380]

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- On June 8, near Canadian, Texas, a trackhoe operator suffered burns, after a fire from leaking 4-inch gas-gathering pipeline that was undergoing maintenance. Fumes entered the engine of the trackhoe and ignited.[381]
- A contractor was killed and two others injured after an explosion at a BP gas compressor station in Durango, Colorado on June 25. BP, Halliburton, and the other contractors were fined $7,000 each for safety violations in that work.[382][383]
- A West Shore Pipe Line petroleum products pipeline burst near Jackson, Wisconsin on July 17, releasing about 54,000 gallons of gasoline. At least one family self evacuated due to the leak. At least 44 water wells nearby were contaminated from benzine in the gasoline, including a municipal well. A LF-ERW seam failure was suspected as the cause. Further testing revealed that at least 26 other areas on this pipeline needed repairs, with 22 within the Jackson Marsh Wildlife Area.[384][385][386][387]
- A 14-inch gas gathering pipeline exploded and burned on July 18 near Intracoastal City, Louisiana. There were no injuries or major property damage reported.[388]
- On July 23, a compressor station operated by Williams Companies in Windsor, New York was venting gas in a "routine procedure" — during a lightning storm — when the vent was ignited by lightning, causing a fireball "hundreds of feet into the air"[389][390]
- An Enbridge crude oil pipeline ruptured in Grand Marsh, Wisconsin, releasing an estimated 1,200 barrels of crude oil. The pipeline had been installed in 1998. Flaws in the longitudinal welds had been seen during X-ray checks of girth welds.[161][391]
- Four contract workers were injured during a flash fire at a Wyoming gas processing plant on August 22.[392]
- A jet fuel pipeline near Chicago began leaking on August 27. The burst pipeline spilled an estimated 42,000 gallons of jet fuel into a ditch that empties into the Calumet Sag Channel in Palos Heights, Illinois. External corrosion was the cause of the pipeline failure.[393][394][395]
- On August 28, a Atmos Energy repair crew struck an 8-inch gas main in McKinney, Texas, causing a fire. Four Atmos workers were treated for injuries. 1,000 Atmos gas customers lost gas service for a time.[396][397]
- On September 6, a 10-inch gas gathering pipeline exploded and burned near Alice, Texas. Flames reached 100 feet high, and caused a 10-acre brush fire. There were no injuries.[398]
- An explosion and fire hit a Crestwood Midstream Partners gas compressor station in Hood County, Texas on September 6. Heavy damage to a sheet metal building resulted, but, there were no injuries reported to crew there.[399]
- A Colorado Interstate Gas gas compressor in Rio Blanco County, Colorado caught fire on September 11. There were no reported injuries.[400][401]
- On September 24, an excavator struck a 4-inch natural gas line on Route 416 in Montgomery, New York. Escaping gas ignited, and it took 90 minutes before the gas was shut off. There were no injuries.[402]
- The operator of an excavator machine narrowly escaped serious injury in Lewiston, Idaho on November 19, when his machine hit a gas pipeline during road work. The resulting fire destroyed a railroad signal, along with several telephone poles, and road construction equipment. The depth of the pipeline has been misjudged at that location.[403][404]
- On November 20, about 38,000 gallons of crude oil spilled from an Enbridge pipeline at a tank farm in Mokena, Illinois.[405]
- Two men were injured in an explosion and fire at a natural gas production facility east of Price, Utah on November 20.[406]
- On November 23, a gas company worker looking for the source of a reported gas leak in a Springfield, Massachusetts strip club pierce a gas line. The gas later exploded, injuring 21, devastating the strip club, and damaging numerous nearby buildings.[407]

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- On November 30, a heavy equipment operator punctured a 12-inch gas transmission pipeline, near the city of Madera, California. The adjacent highway, along with several rural roads, was shut down for hours, while houses and businesses in the area were evacuated.[408]
- A malfunction in a gas compressor caused a fire on December 4, north of Fort Worth, Texas. There were no injuries.[409]
- On December 5, a 16-inch gas pipeline at 500 psi of pressure exploded and burned near a natural gas plant in Goldsmith, Texas. A fireball 250 feet high was created after the explosion, destroying 12 to 15 utility poles, and caliche and rocks the size of bowling balls damaged a road. There were no injuries reported.[410]
- On December 11, at approximately 12:40pm, a 20-inch gas pipeline owned by NiSource Inc., parent of Columbia Gas, exploded along I-77 between Sissonville and Pocatalico, West Virginia. Several people suffered minor injuries, four houses were destroyed, and other buildings were damaged. Early reports announced the NTSB was investigating as to why alarms in the control room for this pipeline did not sound for this failure.[411][412][413][414]
- On December 26, a 20-inch Florida Gas Transmission Company pipeline ruptured near Melbourne, Florida, ejecting a 20-foot section of the pipeline. There was no fire or injuries.[415]

2013[edit]

- On January 1, a Colonial Pipeline line was overpressured by improper operation, causing a spill of about 5,500 gallons of petroleum product in Greensboro, North Carolina. About 1,000 gallons of product was not recovered.[204]
- On January 15, a utility crew struck and ruptured a 4-inch gas pipeline in Lewisville, Texas, causing a nearby house to explode later on. The explosion killed a man.[416]
- An independent contractor installing fiber-optic cable for a cable company in Kansas City, Missouri inadvertently struck an underground gas line on February 19. Gas later caught fire, and created an explosion that destroyed a popular local restaurant, killing one of the workers there, and injuring about 15 others near the scene.[417][418]
- A tug towing a barge struck and ruptured a Chevron LPG pipeline at Bayou Perot, a marshy area on the borders of Jefferson Parish and Lafourche Parish, Louisiana on March 12. The tug Captain was severely burned when the escaping gas ignited, and died several weeks later from those injuries.[419][420]
- On March 8, pipeline equipment failure resulted in a spill of 6,000 barrels of crude oil, in eastern Columbia County, Arkansas.[421]
- On March 18, a Chevron 8-inch petroleum products pipeline ruptured along a seam, spilling Diesel fuel into Willard Bay State Park near Ogden, Utah. Wildlife was coated with Diesel, but, the fuel was prevented from entering into water supply intakes. About 25,000 gallons of Diesel were spilled.[422][423]
- A Williams Companies 24-inch gas gathering pipeline failed in Marshall County, West Virginia on March 22. There were no injuries.[424]
- The 2013 Mayflower oil spill occurred when ExxonMobil's 20-inch Pegasus crude oil pipeline spilled near Mayflower, Arkansas on March 29, causing crude to flow through yards and gutters, and towards Lake Conway. Wildlife was coated in some places. Twenty-two houses were evacuated, due to the fumes and fire hazard. Some estimates say the total amount spilled could reach upwards of 300,000 gallons of diluted bitumen were spilled. Hook cracks and extremely low impact toughness in the LF-ERW seam of the pipe were identified as causes of the failure.[425][426][427][428]
- On April 4, an explosion and fire occurred at a gas compressor station near Guthrie, Oklahoma. Nearby houses were evacuated. There were no injuries reported.[429]

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- A flash fire at a pipeline gas compressor station broke out when natural gas liquids ignited in Tyler County, West Virginia on April 11, seriously burning three workers, two of whom later died. The workers were performing pipeline pigging operations.[430][431]
- On April 30, the Pegasus oil pipeline spilled a small amount of crude into a residential yard in Ripley County, Missouri, a month after the same pipe spewed thousands of barrels of crude in Arkansas. The Pegasus pipeline was out of service from the Mayflower, Arkansas spill, accounting for the minimal amount of oil spilled in Missouri.[432]
- On May 9, Diesel fuel was detected to be leaking from a Marathon pipeline in Indianapolis, Indiana. Over 20,000 gallons of Diesel leaked, at a slow rate that was not detected by SCADA systems. Cleanup cause a nearby major road to be shut down for five days. There were no injuries reported.[433]
- Late night on May 14, an explosion and fire hit a Williams Companies gas compressor station near Brooklyn Township, Pennsylvania. There were no reported injuries.[434]
- On May 8, the Kinder Morgan Tejas pipeline compressor station near Crockett, Texas, required an emergency shutdown and subsequently had a fire that caused $7,502,188 in property damage.[435][436]
- On May 30, two construction workers were injured, when a fire erupted during welding at a Williams Companies natural gas facility in Hunterdon County, New Jersey.[437]
- A 12-inch gas transmission pipeline failed near Torrington, Wyoming on June 13. LF-ERW seam failure was suspected as cause. There was no fire or injuries.[438]
- On June 18, in Washington Parish, Louisiana, a Kinder Morgan Florida Gas Transmission Company 30" diameter pipeline ruptured and exploded before dawn, jolting residents out of their beds. No one was seriously hurt but 55 homes were evacuated. The blast knocked down trees in an area about 200 yards across and the fire burned those within another 300 yards. "The ground around the crater is completely bare. The dirt around it is just like it had been cooked in a kiln," and an 80-foot section of pipe was destroyed.[439]
- On July 4, a fire involved a gas compressor and a nearby ruptured 2-inch gas pipeline in Gilmore Township, Pennsylvania. There were no injuries.[440]
- An 8-inch natural gas pipeline released gas from a rupture at 1,400 psi, for 90 minutes in New Franklin, Ohio on July 22, forcing 75 people to evacuate the area. Afterward, the local Fire Chief said that pipeline owners refused to give information to first responders in previous requests.[441]
- Early on July 23, a downed 13,000 volt power line sparked a massive gas fire in Mamaroneck, New York when a gas main was damaged by the electricity. Three automobiles were destroyed, and houses were threatened for a time.[442]
- On July 26, a leaking BP 20-inch crude oil pipeline spilled 50 to 100 barrels of crude oil in Washington County, Oklahoma. Some of the crude spilled into a drainage ditch leading to a water reservoir.[443]
- On the evening of August 12, a 10-inch NGL pipeline exploded and caused a massive propane-ethane mix fire in Erie, Illinois. A number of nearby residents were evacuated for a while, but, there were no injuries.[444]
- A leak developed on a valve on Longhorn Pipeline in Austin, Texas during maintenance on August 14, spilling about 300 gallons of crude oil. There were no evacuations.[445]
- Atmos Energy crews dug into a 4-inch gas pipeline in Overland Park, Kansas on September 2, causing an explosion and fire. There was no major damage or injuries.[446]
- A 10-inch gas gathering pipeline ruptured and burned in Newton County, Texas on September 21. About a dozen people from nearby houses were evacuated for a time. There were no injuries.[447]
- On September 24, a Denton TX city water utility worker ruptured a 1/2-inch gas pipeline in Denton, Texas, which immediately caused a fire that gave the worker minor burns. There was no other significant damage.[448]

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- A farmer near Tioga, North Dakota smelled oil for several days, before discovering a leaking 6-inch 20-year-old Tesoro pipeline under his wheat field, on September 29. Crews tried to burn off the oil at first. The spill size was estimated at 865,000 gallons, and covered over seven acres. There were no injuries. Corrosion was suspected as being the cause. Governor Jack Dalrymple said he wasn't told of the spill until October 9. In May 2014, it was announced that it would 2 1/2 more years before the spilled crude would be cleaned up.[449][450]
- On October 7, a gas pipeline burst in Howard County, Texas. There was no fire, but, dangerous hydrogen sulfide in the gas forced evacuations of nearby residents. There were no injuries.[451]
- On October 7, authorities were notified of a Lion Oil Trading and Transportation crude oil pipeline leak in Columbia County, Arkansas. It was estimated that the leak started on September 21. Oil spread into a Horsehead Creek tributary.[452]
- A 30-inch Northern Natural Gas pipeline exploded and burned in Harper County, Oklahoma on October 8. 220 feet of the pipe was ejected from the ground. Flames were seen for a number of miles, and four houses nearby were evacuated. Oklahoma Highway 283 was closed for several hours until the fire was determined to be under control and safe. There were no injuries.[453][454][455]
- On October 29, a Koch Industries 8-inch pipeline spill about 400 barrels of crude oil near Smithville, Texas. The oil polluted a private stock pond and two overflow reservoirs.[456]
- A Chevron operated 10-inch LPG pipeline was ruptured by contractors for the company installing a Cathodic protection system, near Milford, Texas, on November 14, causing a large fire, and forcing the evacuation of Milford and 200 students of a nearby school. A nearby 14-inch pipeline was threatened by the failure, but did not fail. There were no injuries reported.[457][458][459]
- An ExxonMobil gas plant exploded and burned on November 17, near Kingsville, Texas. The plant burned for over a day, but there were no reported injuries.[460]
- On November 18, a gas pipeline burst near Ranger, Texas, causing a fire in a field, with flames reaching 100 feet high. Some houses nearby were evacuated for a time. The owner of the pipeline, Hanlon Gas, had been installing a new compressor station, and they believe a malfunction led to the rupture and fire. There were no injuries reported.[461]
- On November 28 a 30-inch Panhandle Eastern natural gas pipeline exploded in Hughesville, Missouri causing several nearby buildings to catch fire. There was a local evacuation but no injuries. Metallurgical examination determined the root cause of the failure to be corrosion.[189][462]
- On December 9, a 2-inch pipe on a propane dehydrator failed at the Dixie Pipeline Terminal in Apex, North Carolina, forcing evacuations and sheltering in place at nearby businesses. There was no fire or explosion.[463]
- A Sunoco pipeline was found leaking gasoline on December 20, near Coal Township, Pennsylvania, from external corrosion. The initial spill size was reported as two gallons, but, later on, 480 tons of soil were removed as part of the remediation of that leak.[464][465][466]
- On December 27, two natural gas company workers had minor burns when the pipeline they were working leaked, and the escaping gas exploded and ignited in Shrewsbury, Massachusetts. Flames 30 feet high knocked out phone service in the area.[467]

2014[edit]

- On January 7, a Colonial Pipeline line leak from equipment failure in Fountain Inn, South Carolina, spilling about 52,000 gallons of petroleum product, of which around 8,000 gallons was not recovered.[204]
- On January 10, a 12-inch PSNC gas transmission pipeline exploded and burned in Asheville, North Carolina. The cause was damage to the pipeline during installation in 2003. There were no injuries, but the costs of property damage was around $825,000.[468]
- On February 10, a gas pipeline exploded and burned near Tioga, North Dakota. There were no injuries.[469]
- On February 13, a 30-inch diameter Columbia Gulf Transmission gas pipeline carrying natural gas exploded near Knifley, Kentucky, sending two people to the hospital with injuries, destroying

IND 821-1 cont'd

two houses, and alarming residents, who saw flames from miles away. Later, it was determined that Hydrogen embrittlement had caused the pipe failure from when the pipeline was installed in 1965.[470][471]

- On February 19, a leaking gas main caused a gas build up in a nearby rowhouse, that exploded in [Baltimore, Maryland], killing one youth, and seriously injuring another walking by the area. 3 other people had minor injuries. The area on the gas main near the leak had been patch twice in previous months.[472][473]
- On March 6, contractors working for Shell Oil Company hit Shell's Houston-to-Houma (Ho-Ho) crude oil pipeline near Port Neches, Texas, spilling 364 barrels of crude oil.[474]
- **2014 East Harlem gas explosion**: On March 12, there was a gas explosion in New York City, New York. NTSB investigators found natural gas in the soil nearby, indicating that the gas leak had existed for a while before the explosion.[475]
- On March 18, a 20-inch Mid-Valley Pipeline Company pipeline failed in Hamilton County, Ohio, spilling at least 364 barrels of crude oil into the adjacent Oak Glen Nature Preserve. Animals in the area were affected.[476][477]
- On March 18, a 3-inch, half-mile flare waste gas pipeline in a neighborhood in Arvin, California, was discovered leaking, a few blocks from Arvin High School, in a residential area. It had been leaking for as long as two years.[478]
- On March 31, a pipeline running to a Williams Companies LNG storage facility in Plymouth, Washington exploded and sent shrapnel flying that ruptured an LNG storage tank. Nearly 1,000 residents were evacuated and at least five employees at the facility were injured.[479][480]
- A 12-inch Williams Companies gas pipeline failed at a weld in Moundsville, West Virginia. The following explosion and fire explosion scorched trees over a 2-acre area near Moundsville. Several houses were evacuated as a precaution. There were no injuries reported.[481]
- On April 17, a private excavator accidentally cut a gas line while doing some work in Union Township, Licking County, Ohio on April 17. The man suffered second degree burns to the upper portion of his body. There was no damage to any buildings.[482]
- On April 23, an explosion and fire hit a Williams Companies gas processing plant in Opal, Wyoming. All 95 residents of the town were evacuated, and part of US Highway 30 was closed for a time.[483][484]
- On May 6, Sinclair Oil Corporation pipeline operators detected a pressure drop on a pipeline, with the problem being traced two days later to a leak in Knox County, Missouri. A mixture of gasoline and Diesel fuel contaminated soil on a farm.[485]
- On May 12, three workers from Plantation Pipeline inadvertently ruptured their pipeline at a pump station in Anderson County, South Carolina, causing a geyser of gasoline, and spraying the workers with it. There was no fire, but the workers had to be decontaminated at a hospital.[486]
- On May 17, at Port St. John, Florida, Kinder Morgan's 36" Florida Gas Transmission pipeline ruptured, forcing evacuation of 7 homes and halting train traffic through Brevard Co. for 3 hours near the Florida Power & Light plant. Florida Gas Transmission workers searched for a leak when pressure dropped in the line. Homes, vehicle & train traffic were reopened after the remaining gas escaped from the pipe.[487] This pipeline failure caused $177,321 in property damage.[488]
- On June 26, near East Bernard, Texas, a gas pipeline adjacent to a Kinder Morgan gas compressor plant blew out, destroying the roadway and setting a nearby truck on fire just south of Highway 59. Flames as high as 150 feet were shooting out of the pipeline. The focus was on a 27-inch pipeline that sends gasoline to different tank farms along the line.[489]
- On July 10, a vent stack at a Williams Field Services gas pipeline compressor station in Susquehanna County, Pennsylvania caught fire. Only minor damage was reported at other parts of the station.[490]
- On July 23, at Milledgeville, Georgia, Midway Elementary School faculty and staff were evacuated due to a fire caused by a gas leak at nearby Southern Natural Gas Co. tap station.

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Fire rescue personnel closed down Highway 441 South for an hour. Due to the amount of pressure, precautionary measures were taken so pipe wouldn't rupture under the road while Southern Natural Gas tried to determine the cause of the leak. "It could be some type of failure in a valve or regulator. Right now we don't know but Southern Natural Gas is looking into it." No injuries were reported.[491]

- On August 4, a Greka 6 inch pipeline spilled over 1,200 gallons of crude oil at the Zick Compressor Station by Williams Field Services in Hop Bottom near Santa Barbara County, California. The oil spread out over less than a mile from the leak and did not enter a river. The station can process 455 million cubic feet of natural gas per day.[492]
- On August 12, a mulching machine hit a 12-inch natural gas pipeline in Rusk County, Texas. The operator of the machine was killed in the following explosion.[493]
- On August 21, four workers were injured in a fire while a crew was performing maintenance on a natural gas pipeline in Garvin County, Oklahoma. The injured workers were treated and released from a hospital, and there was no explosion.[494]
- On September 14, a contract worker performing routine maintenance on a Chevron offshore gas pipeline was killed, and two other workers were injured. The accident occurred 6 miles south of Timbalier Bay off the southeast coast of Louisiana.[495]
- On September 16, more than 500 residents of Benton Township, Michigan, were forced to leave their houses for 10 to 12 hours, after authorities discovered a leak on TransCanada Corporation's 22-inch ANR gas transmission pipeline.[496][497]
- On October 13, a gas transmission pipeline failed near Centerview, Missouri, causing an explosion and massive fire for several hours. There were no injuries.[169][498]
- On October 13, a Sunoco/Mid-Valley crude oil pipeline ruptured, and spilled about 168,000 gallons of crude oil in Caddo Parish, Louisiana. Wildlife was killed.[499]
- A 24-inch gas transmission pipeline was hit by excavators on October 23, near Newport, Arkansas. Five nearby houses were evacuated, and two highways and a railroad were closed for a time. There was no fire or injuries.[500]
- On October 28, an 8-inch natural gas condensate pipeline exploded in Monroe County, Ohio. A large fire followed. There were no injuries.[501]
- On December 8, gasoline was discovered leaking from Kinder Morgan Plantation Pipeline in Belton, South Carolina. It was found that the 26-inch pipeline had leaked into a nearby creek. The cause was a failure at a sleeve that was part of an earlier repair.[502] As of April 2015, it was estimated that 8,000 barrels (42 gallons per barrel) or more than 300,000 gallons of gasoline had leaked. After four months of cleanup, only 176,901 gallons of product had been recovered and removed.[503]

2015[edit]

- On January 14, during work to free a trapped inline inspection unit, a leak was discovered on the Evangeline Pipeline, near Cameron Parish, Louisiana. This pipeline had been given a Corrective Action Order in October 2014, due to a number of leaks.[504][505][506]
- Also on January 14, a gas pipeline exploded near the Ross Barnett Reservoir in Brandon, Mississippi, creating a sizable crater in the ground and burning 6 acres of vegetation before the fire was extinguished. No injuries were reported. The failure was due to a "hard spot" from manufacturing, that already had a repair sleeve on it. There are 788 sleeves on the Index 129 pipeline from Edna, Texas, to Sterlington, Louisiana; and, 726 sleeves on the Index 130 pipeline from Marchand Junction, Louisiana to Kosciusko, Mississippi. Both were built from pipe made in 1952.[507][508][509]
- On January 16, a transmission pipeline operated by Kinder Morgan subsidiary Southern Natural Gas had an equipment malfunction in Walthall County, Mississippi.[510]
- On January 17, oil from a broken pipeline seeped into the Yellowstone River, and contaminated the water supply 10 miles south of Glendive, Montana. The release was from Bridger Pipeline

IND 821-1 cont'd

LLC's 12-inch Poplar line, which can carry 42,000 barrels a day of crude from the Bakken formation and runs from Canada south to Baker, Montana. Bridger Pipeline is a subsidiary of True Cos., a privately held Wyoming-based company. The company said in a statement that the pipeline was shut down within an hour of the leak. About 30,000 gallons of crude was spilled, with about 28,000 gallons of crude being lost.[511][512][513]

- On January 21, a petroleum products pipeline in Honolulu, Hawaii ruptured, due to external corrosion, spilling about 42,000 gallons of petroleum product, of which about 22,000 gallons was lost.[514]
- On January 21, a crude oil pipeline pump station caught fire northwest of Texas City, Texas. Texas City fire officials said that company officials reported that there had been issues with the pump station over the weekend.[515]
- On January 26, a 20-inch ATEX pipeline carrying ethane exploded and burned in Brooke County, West Virginia. Despite snow in the area, five acres of woodlands burned, and 24,000 gallons of ethane were consumed. The fireball melted siding on nearby homes and damaged power lines; it is believed that day's snowy weather lessened the damage. Initial reports suspect a girth weld failure, with the pipeline being less than two years old. There were no injuries.[516][517]
- On January 29, near Bowling Green, Missouri, a rupture in a Rockies Express 42-inch natural gas pipeline blew a 20 by 20-foot crater and forced a six-hour evacuation of 50 families. The rupture occurred in a vacant field a few yards east of Pike County Road 43. Strong winds helped dissipate gas until a temporary cap was put in place.[518] This explosion caused $2,672,345 in property damage and was due to a fault in the pipe's fabrication or construction.[519]
- On February 10 in Hopkinton, Massachusetts, the temperature caused "natural force damage" to a Kinder Morgan Tennessee Gas Pipeline, causing $55,150 worth of property damage.[510]
- On February 17, a suspected electrical arc made a hole in a Marathon Petroleum pipeline in Shively, Kentucky, spill about 6,700 gallons of jet fuel. More than 2,500 tons of soil were removed to clean up the area.[520][521]
- On February 25, a 26-inch crude oil pipeline in Navarro County near the Town of Dawson, Texas, failed, spill about 50 barrels of crude oil. Near the failure, investigation showed that the pipe had lost about 80% of its thickness, due to external corrosion. This anomaly was not seen in a 2011 test of this pipeline.[522]
- On March 2, a Kinder Morgan Tennessee Gas Pipeline leaked due to equipment failure, causing $281,890 of property damage in Marshall, Mississippi.[510]
- On March 13 a pipeline Patrol pilot identified an oil sheen on a pond near Tehuacana Creek, Texas which was then linked to a leaking 10 inch petroleum products pipeline. About 50 barrels of diesel fuel were spilled.[523]
- On March 20, a pipe owned by Kinder Morgan subsidiary Southern Natural Gas failed in Rolling Fork, Mississippi, and on March 23, another of that subsidiary's pipes failed due to equipment malfunction in Augusta, Georgia, causing $311,785 in property damage.[510]
- On April 9, 2 Williams Companies pipelines broke within hours of each other in Marshall County, West Virginia. A 4-inch condensate pipeline broke at 8 pm local time, spilling about 132 barrels of condensate into a creek. Around 10:50 pm local time, a 12-inch gas pipeline ruptured. There was no fire or injuries. Heavy rains were said to be the cause of the failures.[524][525]
- On April 13, a Kinder Morgan / Natural Gas Pipeline Co. of America pipeline exploded and burned near Borger, Texas. One home was evacuated, but, there were no injuries. The explosion, caused by equipment failure due to environmental cracking, caused $455,000 in property damage.[526]
- On April 17, a 12-inch natural gas pipeline near Fresno, California operated by Pacific Gas and Electric Corp was ruptured by a backhoe. The resulting explosion killed 1 person and injured 12 others.[527]
- On May 15, Kinder Morgan's Tennessee Gas Pipeline leaked in Powell County, Kentucky causing $23,400 in property damage.[510]

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- On May 19, a Plains All American Pipeline oil pipeline ruptured near Refugio State Beach, also near Goleta, California, spilling about 124,000 gallons of crude oil. It is referred to as the Refugio Oil Spill.[528][529]
- On May 31, a 24-inch natural gas back-up pipeline that runs under the Arkansas River in Little Rock, Arkansas ruptured releasing 3.9 million cubic feet of natural gas. The pipeline was not currently in use. No one was injured. A tugboat was damaged.[530][531]
- On June 9 in Moorehouse Parish, Louisiana, Kinder Morgan's Tennessee Gas Pipeline equipment failed, due to environmental cracking, and leaked, causing $73,395 in property damage.[510]
- On June 9, a 24-inch natural gas pipeline ruptured in Lycoming County, Pennsylvania. About 130 individuals were evacuated from their homes. No injuries or damage reported. there was no fire The cause was Stress corrosion cracking.[532][533]
- On June 10, Kinder Morgan's El Paso Natural Gas control/relief equipment failed and leaked in Gray County, Texas.[510]
- On June 13, a 42-inch gas gathering pipeline exploded and burned near Cuero, Texas. 7 homes were evacuated for a time, but there were no injuries.[534]
- On June 15, Kinder Morgan's Natural Gas Pipeline Co. of America equipment failed for unknown causes, with $260,555 of property damage in Marshall, Texas (that area's third documented Kinder Morgan leak).[510]
- On June 18, in Victoria Texas, Kinder Morgan's Tennessee Gas Pipeline pipe failed due to external corrosion and caused $159,346 in property damage).[510]
- On June 22, a truck driver was killed when his rig veered off a highway and broke above ground facilities for a propylene pipeline in Houston, Texas. The highway was closed for several hours while the gas dissipated.[535]
- Four workers were hurt on June 25, when a 4-inch gas pipeline exploded at a gas pipeline facility, near White Deer, Texas. 2 of the workers were critically injured. The cause of the explosion was not immediately known.[536]
- On July 10, a fitting on a 20-inch Plains All American Pipeline crude oil pipeline broke, spilling 4200 gallons of crude oil near Grantfork, Illinois. Much of the crude reached a nearby creek. There were no injuries.[537]
- On July 15, two workers were hurt by an explosion, when a bulldozer hit a 4-inch gas pipeline, at an EQT gas compressor station in Worthington, Pennsylvania.[538]
- On August 3, two individuals were injured in Falfurrias, Texas when a natural gas pipeline operated by Kinder Morgan ruptured and exploded due to external corrosion, with $191.498 in property damage. Later investigation showed that the pipe split along an ERW seam.[539][540]
- On August 7, a natural gas liquids pipeline in Weld County, Colorado burned, after being struck by a third party.[541]
- 0n August 13, crew working for Colonial Pipeline damaged one of Colonial's lines in Kannapolis, North Carolina, spilling about 6,000 gallons of petroleum product. About 1,000 gallons of product was lost.[204]
- On August 13, a natural gas pipeline in Cypress, Texas ruptured and leaked while a contract crew worked in the area. The pipeline was owned by Gulfsouth Pipeline. There were no injuries or immediate damage; residents were evacuated.[542]
- On August 26, two maintenance divers were injured while working on a pipeline owned by Boardwalk/Gulf South Pipeline Co. 25 miles offshore of Louisiana when the pipeline ruptured, and the gas ignited.[543]
- On September 21, a Colonial Pipeline 32 inch main line was discovered to be leaking in Centreville, Virginia. At least 7,000 gallons of gasoline were spilled, forcing several nearby businesses to close.[544][545]

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- On October 8, an explosion occurred at a Williams Companies pipeline facility in Gibson, Louisiana. 4 employees were killed, and, one other injured. The cause of the explosion was from procedure not being followed during welding work.[546][547][548]
- On November 15, work was being performed on a flow control valve, on a Sunoco 10 inch crude oil pipeline, in Wortham, Texas, when the valve failed, injuring 5 workers, and spilling some crude oil. It was later determined that the valve was under 400 psi of nitrogen pressure when it was being worked on.[549]
- On November 30, about 11,000 gallons of gasoline, butane and propane leaked from a pipeline in eastern Summit County, Utah.[550]
- On December 8, a contractor drilled into an 8-inch buried oil line (200 mm) that transports oil from a holding station in Ventura to a Wilmington refinery near Long Beach while setting new poles for Southern California Edison along State Route 118 near Somis that spilled about 7,980 U.S. gallons (190 barrels).[551]

2016[edit]

- On January 2, 3 people were injured, one seriously, one home destroyed, and 50 homes were damaged in Oklahoma City, Oklahoma, when a leak gas from a gas main entered a home. Preliminary results indicate that a leak occurred at a weld seam on the gas main. Later, Oklahoma regulators filed a complaint over the failure with Oklahoma Natural Gas. The complaint alleged the utility failed to properly inspect its system following eight previous leak failures in the neighborhood going back to 1983.[552][553]
- On January 9, a 30-inch Atmos Energy gas transmission pipeline exploded and burned in Robertson County, Texas. 4 families nearby were evacuated.[554]
- On January 11, butane leaking from a pipeline storage facility, in Conway, Kansas, forced a closure of a nearby highway for a time.[555]
- On February 14, a 6-inch crude oil pipeline broke near Rozet, Wyoming, spilling about 1,500 gallons of crude oil into a creek bed.[556]
- On February 16, an explosion and fire occurred at a gas plant in Frio County, Texas. 2 employees at the plant were injured.[557]
- On February 24, a 10-inch propane pipeline exploded and burned, near Sulphur, Louisiana. There were no injuries. About 208,000 gallons of propane were burned. The cause was from manufacturing defects.[558][559]
- On March 11, about 30,000 gallons of gasoline spilled from a leaking plug on a pipeline, at a tank farm in Sioux City, Iowa.[560]
- On March 22, about 4,000 gallons of gasoline spilled from a 6-inch petroleum products pipeline in Harwood, North Dakota.[561]
- On April 2, the TransCanada Corporation Keystone Pipeline was observed by a local resident to be leaking, near Freeman, South Dakota. The cause was a crack in a girth weld, and amount of tar sands dilbit spill was about 16,800 gallons.[562][563]
- On April 12, a pipeline at a gas plant in Woodsboro, Texas exploded, killing 2 men, and injured another worker.[564]
- On April 17, a 10 petroleum products pipeline failed in Wabash County, Illinois, resulting in a sheen on the Wabash River. About 48,000 gallons of diesel fuel was spilled.[565]
- On April 29, a 30-inch Texas Eastern/Spectra Energy pipeline exploded, injuring one man, destroying his home and damaging several others. The incident was reported at 8:17 a.m., near the intersection of Routes 819 and 22 in Salem Township, Westmoreland County, Pennsylvania. Later, Spectra Energy Corp. announced plans to dig up and assess 263 miles of that pipeline, from Pennsylvania to New Jersey. Corrosion had been detected at the failed seam 4 years before the rupture.[566][567][568]
- On May 20, a Shell Oil Company pipeline leaked near Tracy, California, spilling about 21,000 gallons of crude oil.[569]

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- On June 23, a Crimson Pipeline crude oil line leaked in Ventura County, California. Initial reports said the spill size was from 25,200 gallons to 29,000 gallons, but, later reports estimate 45,000 gallons of crude were spilled.[570][571]
- On July 6, a Plantation Pipeline line was noticed to be leaking in Goochland County, Virginia. The spill did not reach nearby waterways.[572]
- On August 12, contractors were working on one of the main lines in Sunoco Pipeline LP's Nederland, Texas terminal when crude oil burst through a plug that was supposed to hold the oil back in the pipeline and ignited. The contractors were knocked off the platform to the ground, suffering injuries from the fall and severe burns. 7 contractors were injured.[573]
- On September 4, a pipeline broke in Kern County, California, spilling reclaimed water & oil.
- On September 5, a pipeline in Bay Long, Louisiana was hit by dredging operations, resulting in a spill of about 5,300 gallons of crude oil into the water.[574]
- On September 9, a Colonial Pipeline mainline leak was noticed by workers on another project, in Shelby County, Alabama. At least 252,000 gallons of gasoline leaked from line.[575][576]
- On September 10, a Sunoco pipeline ruptured near Sweetwater, Texas. About 33,000 gallons of crude oil were spilled. The pipeline was just over a year old.[577]
- On October 11, two Nicor Gas workers were injured, and two townhouse units destroyed in a massive fire and explosion, caused by a gas leak in Romeoville, Illinois.[578]
- On October 17, an 8-inch ammonia pipeline started leaking, near Tekamah, Nebraska. A farmer living nearby went to find the source of the ammonia, and was killed by entering the vapor cloud. About 50 people were evacuated from their homes.[579]
- On October 19, a contractor in Portland, Oregon hit a 1-inch gas pipeline during work. Within an hour, there were 2 explosions, injuring 8 people, destroying or damaging several buildings, and started a fire. Contractors claim a utility locate was done before work began.[580]
- On October 21, an 8-inch Sunoco pipeline ruptured in Lycoming County, Pennsylvania, spilling about 55,000 gallons of gasoline into the Susquehanna River. The river was running high at the time.[581]
- On October 24, a pipeline ruptured on the Seaway Pipeline, in Cushing, Oklahoma, spraying the area with crude oil.[582]
- On October 31, a Colonial Pipeline mainline exploded and burned in Shelby County, Alabama, after accidentally being hit by a track hoe. One worker died at the scene, and 5 others were hospitalized, with one of those workers dying a month later. The explosion occurred approximately several miles from the 9 September 2016 breach.[583][584][585]
- On November 29, an Enterprise Products pipeline exploded in Platte County, Missouri, burning an ethane propane mixture. There were no evacuations or injuries.[586]
- On December 2, equipment failure in a Denbury Resources source water pipeline led to a leak of approximately 84,000 gallons of source water into Skull Creek, in Bowman County, North Dakota.[587]
- On December 5, a 6-inch Belle Fourche pipeline spilled 176,000 gallons of crude oil into Ash Coulee Creek in Billings County, North Dakota.[588]

References[edit]

1. ^ Jump up to:[a] [b] [c] *"UNITED STATES OF AMERICA, and STATE OF NORTH CAROLINA, Plaintiffs, v. PLANTATION PIPE LINE COMPANY, Civil Action No. 3:08-cv-500"* (PDF). *Archived from the original* (PDF) on October 28, 2013. Retrieved June 14, 2012.
2. **Jump up^** *"Use of In Situ Burning at a Diesel Spill in Wetlands and Salt Flats, Northern Utah, U.S.A: Remediation Operations and 1.5 Years of Post-Burn Monitoring"*. Retrieved April 12, 2014.
3. **Jump up^** *"Jan. 21, 2000 – ProPublica"*. Projects.propublica.org. January 21, 2000. Retrieved April 12, 2014.
4. **Jump up^** *"Jan. 21, 2000 – ProPublica"*. Retrieved January 15, 2015.

IND 821-1 cont'd

5. **Jump up^** *"The Item – Google News Archive Search"*. Retrieved January 15, 2015.
6. **Jump up^** *"Pipeline Accident Brief PAB-01-02"*. Ntsb.gov. Retrieved January 18, 2016.
7. **Jump up^** *"Letter to Ms. Daragh Porter"* (PDF). *Archived* (PDF) from the original on October 28, 2013. Retrieved October 30, 2016.
8. **Jump up^** Ron Rothschadl (August 3, 2005). *"SUNOCO Oil Spill Settlement"*. Fws.gov. Retrieved April 2, 2013.
9. **Jump up^** *"IncidentNews: Sun Oil Pipeline"*. Incidentnews.gov. Retrieved April 2, 2013.
10. **Jump up^** *"National Transportation Safety Board"* (PDF). Ntsb.gov. March 9, 2000. Retrieved January 18, 2016.
11. **Jump up^** *"Pipeline Accident Report PAR-02-01"*. Ntsb.gov. Retrieved January 18, 2016.
12. **Jump up^** *"Settlement: Colonial Pipeline Company Clean Water Act Settlement | Civil Enforcement | Compliance and Enforcement | US EPA"*. Epa.gov. Archived from the original on October 28, 2013. Retrieved April 2, 2013.
13. **Jump up^** *"Letter to Mr. Robert C. Luckner, President Wolverine Pipe Line Company"* (PDF). *Archived* (PDF)from the original on May 27, 2010. Retrieved October 30, 2016.
14. **Jump up^** *"The Argus-Press – Google News Archive Search"*. Retrieved January 15, 2015.
15. **Jump up^** *"Reading Eagle – Google News Archive Search"*. Retrieved January 15, 2015.
16. **Jump up^** *"July 5, 2000 – ProPublica"*. Retrieved January 15, 2015.
17. **Jump up^** *"Pipeline Accident Report PAR-03-01"*. Ntsb.gov. August 19, 2000. Retrieved January 18, 2016.
18. **Jump up^** *"USDOJ: Environment and Natural Resources Division : U.S. v. El Paso Natural Gas Co"*. Justice.gov. July 26, 2007. Archived from the original on April 14, 2013. Retrieved April 2, 2013.
19. **Jump up^** *"The Spokesman-Review – Google News Archive Search"*. Retrieved January 15, 2015.
20. **Jump up^** *"When is a lake not a lake? When is a river not a river? – Clean Water Fund"*. Archived from the original on January 1, 2015. Retrieved January 15, 2015.
21. **Jump up^** *"UNITED STATES OF AMERICA, Plaintiff, v. CHEVRON PIPE LINE COMPANY, Defendant. Civil Action No. 5:05-CV-293-C ECF"* (PDF). *Archived* (PDF) from the original on November 15, 2006. Retrieved October 30, 2016.
22. **Jump up^** Haurwitz, Ralph K.M.; Nesmith, Jeff (July 24, 2001). *"Digs gone awry: a top cause of tragedy"*. Austin, Texas: The American Statesman. Archived from the original on July 7, 2003. Retrieved April 2, 2013.[dead link]
23. **Jump up^** Williams, Brian (September 8, 2000). *"Abilene pipeline blast injures two"*. Lubbock Avalanche-Journal. Retrieved April 2, 2013.
24. **Jump up^** *"Exxon Mobil ordered to pay for pipeline blast"*. Lubbock Avalanche-Journal. Associated Press. November 7, 2001. Retrieved April 2, 2013.
25. **Jump up^** *"The Victoria Advocate – Google News Archive Search"*. Retrieved January 15, 2015.
26. **Jump up^** *"Pipeline Rupture: A Case Study"*. Fire Engineering. Retrieved April 2, 2013.
27. **Jump up^** *"Lawrence Journal-World – Google News Archive Search"*. Retrieved January 15, 2015.
28. **Jump up^** *"Boca Raton News – Google News Archive Search"*. Retrieved January 15, 2015.
29. ^ Jump up to: a b c d e *"Fuel Oil Incident List"*. Archived from the original on August 3, 2010. Retrieved October 30, 2016.
30. **Jump up^** *"NOTICE OF PROPOSED CORRECTWE ACTION ORDER"*(PDF). primis.phmsa.dot.gov.
31. **Jump up^** *"May 1, 2001 – ProPublica"*. Retrieved January 15, 2015.
32. **Jump up^** *"Big blast, but no injuries Pipeline explodes in Platte County field"*. Retrieved July 18, 2013.
33. **Jump up^** *"Lawrence Journal-World – Google News Archive Search"*. Retrieved January 15, 2015.
34. **Jump up^** *"Local News – Potosi oil pipeline blaze doused, but dispute smolders"*. Texnews.com. May 26, 2001. Retrieved February 14, 2014.
35. **Jump up^** *"Gasoline Pipeline Explosion"*. Hazmat2-9.com. July 24, 2001. Retrieved April 2, 2013.
36. **Jump up^** *"Beaver County Times – Google News Archive Search"*. Retrieved January 15, 2015.
37. **Jump up^** *"PHMSA – Southwest – CPF 4-2001-1005-H"*. Phmsa.dot.gov. Retrieved April 2, 2013.
38. **Jump up^** *"Nov 25, 2003 - RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION"* (PDF). Retrieved November 27, 2016.
39. **Jump up^** *"The Argus-Press – Google News Archive Search"*. Retrieved January 15, 2015.

IND 821-1 cont'd

40. **Jump up^** *"Aug. 12, 2001 – ProPublica"*. Projects.propublica.org. August 12, 2001. Retrieved February 14, 2014.
41. ^ Jump up to:[a] [b] *"WORLDWIDE PIPELINE INCIDENTS - APRIL 2002" (PDF)*. Archived from the original *(PDF)* on May 17, 2008. Retrieved October 30, 2016.
42. **Jump up^** *"PHMSA – Southwest – CPF 4-2001-1006-H"*. Retrieved January 15, 2015.
43. **Jump up^** *"Ludington Daily News – Google News Archive Search"*. Retrieved January 15, 2015.
44. **Jump up^** *"The Victoria Advocate – Google News Archive Search"*. Retrieved January 15, 2015.
45. **Jump up^** *"Oct. 15, 2001 – ProPublica"*. Retrieved January 15, 2015.
46. ^ Jump up to:[a] [b] [c] [d] *"United States v TE Products Pipeline Company" (PDF)*. Epa.gov. Retrieved January 18, 2016.
47. **Jump up^** *"The Danish Villages Voice – Google News Archive Search"*. Retrieved January 15, 2015.
48. **Jump up^** *"Document 1 Oklahoma Corporation Commission Pipeline Failure Investigation Report (manually redacted) Filing Date April 17, 2008 13 page(s) of Text (PDF) Photos"*. Dms.ntsb.gov. Retrieved April 2, 2013.
49. **Jump up^** *"Times Daily – Google News Archive Search"*. Retrieved January 15, 2015.
50. **Jump up^** *"March 6, 2002 – ProPublica"*. Retrieved January 15, 2015.
51. **Jump up^** *"Toledo Blade – Google News Archive Search"*. Retrieved January 15, 2015.
52. **Jump up^** *"Re: Great Lakes Gas Transmission Company CPF No. 3-2002-1003-H"(PDF)*.
53. **Jump up^** *"May 31, 2002 - Re: CPF No. 3-2002-501 I H" (PDF)*.
54. **Jump up^** *"June 20, 2002 - RE: CPF No. 1-2002-1004-H" (PDF)*.
55. **Jump up^** *"Pipeline Accident Report PAR-04-01"*. Ntsb.gov. Retrieved January 18, 2016.
56. **Jump up^** *"Family still grieves ten years after fatal Hopkinton explosion – News – Framingham, MA"*. The MetroWest Daily News. Archived from the originalon October 28, 2013. Retrieved April 2, 2013.
57. **Jump up^** *"PHMSA – Data and Statistics – Distribution, Transmission, and Liquid Accident and Incident Data"*. Phmsa.dot.gov. Retrieved April 2, 2013.
58. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved April 2, 2013.
59. **Jump up^** *"U.S. EPA On-Scene Coordinator Report" (PDF)*. Docket No. CWA-08-2002-35. EPA.gov. November 20, 2002. Archived from the original *(PDF)* on November 2, 2012. Retrieved January 18, 2016.
60. **Jump up^** *"Environmental Protection Agency: CWA0820040033CAFO"*. Archived from the original on November 8, 2012. Retrieved October 30, 2016.
61. **Jump up^** *"Nov. 2, 2002 – ProPublica"*. Retrieved January 15, 2015.
62. **Jump up^** *"Dec. 10, 2002 – ProPublica"*. Retrieved January 15, 2015.
63. **Jump up^** *"Lawrence Journal-World – Google News Archive Search"*. Retrieved January 15, 2015.
64. **Jump up^** *"Re: CPF No. 3-2003-1002-H"(PDF)*.
65. **Jump up^** *"CPF No 3-2003-1005-H" (PDF)*. Retrieved 27 November 2016.
66. **Jump up^** *"Re: CPF No. 2-2003-5002H"(PDF)*. Retrieved 27 November 2016.
67. **Jump up^** *"March 13, 2003 – ProPublica"*. Retrieved January 15, 2015.
68. **Jump up^** *"Re: CPF No. 5-2003-1002H"(PDF)*.
69. **Jump up^** *"Re: CPF No. 4-2003-S009H"(PDF)*. Retrieved 27 November 2016.
70. **Jump up^** *"Re: CPF No. 5-2003-1003-8"(PDF)*. Retrieved 27 November 2016.
71. ^ Jump up to:[a] [b] *"CPF No. 5-2003-1003-8" (PDF)*. Retrieved 27 November 2016.
72. **Jump up^** *"Re: CPF No. 3-2003-5014H"(PDF)*. Retrieved 27 November 2016.
73. **Jump up^** *"Natural Gas Pipeline Explodes in Texas"*. Firehouse. May 21, 2003. Retrieved April 2, 2013.
74. **Jump up^** *"May 20, 2003 – ProPublica"*. Retrieved January 15, 2015.
75. **Jump up^** *"National Transportation Safety Board" (PDF)*. Ntsb.gov. July 2, 2003. Retrieved January 18, 2016.
76. **Jump up^** *"Texas-New Mexico Pipeline Co. found guilty of negligence in Midland oil leak | Lubbock Online | Lubbock Avalanche-Journal"*. Lubbock Online. July 3, 2003. Retrieved January 18, 2016.
77. **Jump up^** *"More pipeline documents may be collecting dust near Midland"*.
78. **Jump up^** *"RE: CPF No 3-2003-5019H" (PDF)*. Retrieved 27 November 2016.
79. **Jump up^** *"Re: CPF No. 3-2003-5020H"(PDF)*. Retrieved 27 November 2016.
80. **Jump up^** *"Re: CPF No. 4-2003-$0108" (PDF)*. Retrieved 27 November 2016.

IND 821-1 cont'd

81. **Jump up^** *"Pipeline fails tests; gas shortage likely to continue"*. Azcentral.com. August 20, 2003. Retrieved April 2, 2013. [dead link]
82. **Jump up^** *"Google Drive Viewer"*. Docs.google.com. Retrieved April 2, 2013.
83. **Jump up^** *"Microsoft Word – ArizonaFuelSupplyReport11_13_03.doc"* (PDF). Retrieved April 2, 2013.
84. **Jump up^** *"July 30, 2003 – ProPublica"*. Retrieved January 15, 2015.
85. **Jump up^** *"PHMSA Corrective Action Order, CPF No.4-2003-1008H"* (PDF). Retrieved 28 November 2016.
86. **Jump up^** *"CPF No.3-2003-5023"* (PDF). Retrieved 27 November 2016.
87. **Jump up^** *"Oct. 13, 2003 – ProPublica"*. Retrieved January 15, 2015.
88. ^ Jump up to: a b *"Addicting Info"*. Addicting Info. Retrieved January 15, 2015.
89. **Jump up^** *"CPF No. 3-2003-1010H"* (PDF). Retrieved 27 November 2016.
90. **Jump up^** *"CPF No. 3-2003-5026H"*.
91. **Jump up^** *"CPF No.- 1-2004-5002-H"* (PDF). Retrieved 27 November 2016.
92. **Jump up^** *"CPF No. 1-2010-5008H"* (PDF). Retrieved 27 November 2016.
93. **Jump up^** Bulwa, Demian; St. John, Kelly; Fimrite, Peter (June 24, 2011). *"Pipeline spills 60,000 US gallons (230,000 L) of fuel into Suisun Marsh / Operators noticed problem Tuesday but waited to report it"*. The San Francisco Chronicle.
94. **Jump up^** *"April 27, 2004 – ProPublica"*. Retrieved January 15, 2015.
95. **Jump up^** Gordy Holt; Robert Mcclur (May 24, 2004). *"Wear caused gas leak in Olympic pipeline"*. Seattlepi.com. Retrieved April 2, 2013.
96. **Jump up^** *"Second explosion rocks gas storage facility in Texas"*. USA Today. August 20, 2004.
97. **Jump up^** *"DCA-04-MP-006"* (PDF). Retrieved 27 November 2016.
98. **Jump up^** *"Trespassers blamed for pipeline explosion – Houston Chronicle"*. Chron.com. September 27, 2004. Retrieved April 2, 2013.
99. ^ Jump up to: a b *"Pipeline Firms to Pay $3.65 Million to Settle Claims Related to 2004 Ammonia Spills in Nebraska and Kansas – OPA – Department of Justice"*. Retrieved January 15, 2015.
100. **Jump up^** *"CPF No. 4-2004-5028H"* (PDF). Retrieved 27 November 2016.
101. **Jump up^** *"Star-News – Google News Archive Search"*. Retrieved January 15, 2015.
102. **Jump up^** *"Ammonia Spills in Nebraska, Kansas Cost Pipeline Firms $3.65M"*. ENS-Newswire.com. Retrieved April 2, 2013.
103. **Jump up^** *"Gas Line Explodes In West Little Rock, Arkansas"*. Firehouse. November 1, 2004. Retrieved April 2, 2013.
104. **Jump up^** *"CPF No. 2-2004-5017H"* (PDF). Retrieved 27 November 2016.
105. **Jump up^** *"Kentucky New Era – Google News Archive Search"*. Retrieved January 15, 2015.
106. **Jump up^** *"Pipeline System"* (PDF). Retrieved April 2, 2013.
107. **Jump up^** *"Mojave River Pipeline Spill, San Bernardino County, CA"* (PDF). Part 2. Retrieved April 2, 2013.
108. **Jump up^** *"Mojave River Pipeline Spill, San Bernardino County, CA"* (PDF). Part 1. Retrieved April 2, 2013.
109. **Jump up^** *"Propane Pipeline Leaks In Richland County, North Dakota"*. Firehouse.com. December 16, 2004. Retrieved April 2, 2013.
110. **Jump up^** *"Up To 5,000 Gallons Of Crude Oil Spilled From Montana Pipeline"*. Firehouse.com. December 27, 2004. Retrieved April 2, 2013.
111. **Jump up^** *"Federal Government Reaches Settlement with Pipeline Companies Regarding Crude Oil Spills"*. Justice.gov. August 15, 2006. Retrieved April 2, 2013.
112. **Jump up^** *"Jan. 18, 2005 – ProPublica"*. Retrieved January 15, 2015.
113. **Jump up^** *"Jan. 26, 2005 – ProPublica"*. Retrieved January 15, 2015.
114. **Jump up^** *"Kentucky New Era – Google News Archive Search"*. Retrieved January 15, 2015.
115. **Jump up^** *"Pennsylvania Pile Line Fire Finally Dies Out"*. Firehouse. February 5, 2005. Retrieved April 2, 2013.
116. **Jump up^** *"CPF No. 1-2005-5002H"* (PDF). Retrieved 27 November 2016.
117. **Jump up^** *"Beaver County Times – Google News Archive Search"*. Retrieved January 15, 2015.
118. **Jump up^** *"CPF No. 5-2005-5020H"* (PDF). Retrieved 27 November 2016.
119. **Jump up^** *"Kinder Morgan Pays $5.3M For California Oil Spills"*. Retrieved January 15, 2015.

IND 821-1 cont'd

120. **Jump up^** *"Diesel fuel leaks into creek near El Dorado"*. KSN-TV. Retrieved May 23, 2016.
121. **Jump up^** *"PHMSA: Stakeholder Communications – Operator Information"*. dot.gov. Retrieved May 23, 2016.
122. **Jump up^** *"CPF No.4-2005-1011"* (PDF). Retrieved 27 November 2016.
123. **Jump up^** *"CPF No. 4-200S-S02OH"* (PDF). Retrieved 27 November 2016.
124. **Jump up^** *"Lawrence Journal-World – Google News Archive Search"*. Retrieved January 15, 2015.
125. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved January 15, 2015.
126. **Jump up^** *"CPF No. 4-200S-S021H"* (PDF). Retrieved 27 November 2016.
127. **Jump up^** *"The Victoria Advocate – Google News Archive Search"*. Retrieved January 15, 2015.
128. **Jump up^** *"Aug. 11, 2005 – ProPublica"*. Retrieved January 15, 2015.
129. **Jump up^** *"US Department of Transportation Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety – Failure Investigation Report"* (PDF). Retrieved July 13, 2015.
130. **Jump up^** *"19.2_text.indd"* (PDF). Archived from the original (PDF) on October 27, 2013. Retrieved April 2, 2013.
131. **Jump up^** *"US Department of Transportation: PHMSA Pipeline and Hazardous Materials Safety Administration: OPS Office of Pipeline Safety: Central Region"* (PDF). Archived from the original (PDF) on January 26, 2016. Retrieved October 30, 2016.
132. **Jump up^** Rice, Heidi (December 7, 2005). *"Natural gas explosion shakes up Colo. between Rifle and Rulison"*. SummitDaily.com. Retrieved April 2, 2013.
133. **Jump up^** *"Accident No.: DCA-06-MP-001"*(PDF). Retrieved 27 November 2016.
134. ^ Jump up to:a b *"UNITED STATES SECURITIES AND EXCHANGE COMMISSION Washington, D.C. 20549 FORM 10-Q"* (PDF). Retrieved 28 November 2016.
135. **Jump up^** *"Man Injured In Natural Gas Explosion"*. NBC11news.com. Retrieved April 2, 2013.
136. **Jump up^** *"CPF No. 5-2006-501 5H"* (PDF). Retrieved 27 November 2016.
137. **Jump up^** *"Pipe corrosion in Alaska takes the issue off back burner – Houston Chronicle"*. Chron.com. August 13, 2006. Retrieved April 2, 2013.
138. **Jump up^** *"Corrective Action Order_03292006"* (PDF). Retrieved 27 November 2016.
139. **Jump up^** *"CPF NO. 1-2006-5003-H"* (PDF). Retrieved 27 November 2016.
140. **Jump up^** *"April 17, 2006 – ProPublica"*. Retrieved January 15, 2015.
141. **Jump up^** *"CPF No. 3-2006-5037H"* (PDF). Retrieved 27 November 2016.
142. **Jump up^** *"June 27, 2006 – ProPublica"*. Retrieved January 15, 2015.
143. **Jump up^** *"CPF No. 2-2006-3 007 H"* (PDF). Retrieved 27 November 2016.
144. **Jump up^** *"Gas Explosion Was Kentucky's Fourth In Last Decade"*. Lexington, Kentucky: LEX18.com. January 3, 2012. Archived from the original on October 27, 2013. Retrieved April 2, 2013.
145. **Jump up^** *"Aug. 7, 2006 – ProPublica"*. propublica.org. Retrieved May 23, 2016.
146. **Jump up^** *"PHMSA: Stakeholder Communications – Operator Information"*. dot.gov. Retrieved May 23, 2016.
147. **Jump up^** *"PHMSA: Stakeholder Communications"*. DOT.gov. Retrieved April 2, 2013.
148. **Jump up^** *"liquid0102.zip"*. phmsa.dot.gov. Retrieved September 28, 2016.
149. **Jump up^** *"PHMSA: Stakeholder Communications – Operator Information"*. dot.gov. Retrieved May 23, 2016.
150. **Jump up^** *"Lawrence Journal-World – Google News Archive Search"*. Retrieved January 15, 2015.
151. **Jump up^** *"Searchers Find Body of Fourth Victim of Deadly Louisiana Gas Pipeline Explosion"*. Fox News. October 13, 2006.[dead link]
152. **Jump up^** Clark, Dwayne (October 5, 2006). *"Jacksonville Florida Maritime Lawyers"*. Lawboat.blogspot.com. Retrieved April 2, 2013.
153. **Jump up^** *"PHMSA: Stakeholder Communications"*. DOT.gov. Retrieved April 2, 2013.
154. **Jump up^** *"1 Dead After Wyoming Gas Pipeline Explodes"*. Fox News. November 11, 2006. Retrieved April 2, 2013.
155. **Jump up^** *"El Paso Corp. Fined $2.3 million For Wyoming Pipeline Explosion"*. Huffington Post. December 1, 2009. Archived from the original on October 31, 2013.

IND 821-1 cont'd

156. **Jump up^** *"News"*. Retrieved January 15, 2015.
157. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved January 15, 2015.
158. **Jump up^** *"The Victoria Advocate – Google News Archive Search"*. Retrieved January 15, 2015.
159. **Jump up^** *"Dec. 24, 2006 – ProPublica"*. Retrieved January 15, 2015.
160. **Jump up^** Content, Thomas (January 4, 2007). *"Milwaukee Journal Sentinel: "Oil group cleans spill in Clark County""*. Jsonline.com. Retrieved April 2, 2013.
161. ^ Jump up to:[a] [b] *"CPF No. 3-2012-5017H"* (PDF).
162. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved April 2, 2013.
163. **Jump up^** Bergquist, Lee (February 16, 2007). *"Milwaukee Journal Sentinel: "Oil spill tainted water table""*. Jsonline.com. Retrieved April 2, 2013.
164. **Jump up^** *"Pipeline Fire"*. YouTube. Retrieved January 15, 2015.
165. **Jump up^** *"Gas explosion rocks northwest Harris County"*. Houston Chronicle. Retrieved 28 November 2016.
166. **Jump up^** TGP, Pipeline & Hazardous Materials Safety Administration, http://primis.phmsa.dot.gov.
167. **Jump up^** *"Pipeline Firm Sues Excavator over 2007 Leak"*. 1011now.com. Associated Press. Retrieved January 18, 2016.
168. ^ Jump up to:[a] [b] *"– Pipeline Companies Fined $1 Million for Spills in Three States – ENS"*. ens-newswire.com. Retrieved January 18, 2016.
169. ^ Jump up to:[a] [b] [c] [d] [e] [f] *"CPF No. 3-2014-10088"*(PDF).
170. **Jump up^** *"Bangor Daily News – Google News Archive Search"*. Retrieved January 15, 2015.
171. **Jump up^** *"Leak in Jackson Township, Tioga County in the NCRO weekly report"*. How Should We Do the Mountain?. 16 October 2009. Retrieved 27 November 2016.
172. **Jump up^** *"Small gas leak on Little Mountain posed no danger"*. Retrieved January 15, 2015.
173. **Jump up^** *"BP Alaska facilities still at risk"*. Alaska Dispatch. November 7, 2010. Retrieved April 2, 2013.
174. **Jump up^** *"Investigation begins into what caused natural gas explosion"*. wzzm13.com. Retrieved January 15, 2015.[dead link]
175. **Jump up^** *"Dow Chemical Ethylene Pipe Explodes in Port Arthur, Texas"*. LiveLeak.com. Retrieved April 2, 2013.
176. **Jump up^** Ryan Myers (October 2, 2008). *"Pipeline explosion spurs lawsuit"*. Beaumont Enterprise. Retrieved April 2, 2013.
177. **Jump up^** *"Pipeline Accident Report PAR-09-01"*. ntsb.gov. Retrieved January 18, 2016.
178. **Jump up^** *"CPF No. 2-2008-6002"* (PDF). Retrieved 27 November 2016.
179. **Jump up^** *"Enbridge fined in fatal Minnesota accident – Houston Chronicle"*. Chron.com. August 18, 2010. Retrieved April 2, 2013.
180. **Jump up^** Griese, Noel (May 8, 2009). *"Energy Pipeline News: Enbridge will appeal $2.4 million fine levied for fatal Minnesota accident"*. Energypipelinenews.blogspot.com. Retrieved April 2, 2013.
181. **Jump up^** *"Attorney Matt Minner leads Hare Wynn team in achieving $3 million dollar settlement in explosion case"*. Archived from the original on February 1, 2010. Retrieved October 30, 2016.
182. **Jump up^** *"Fayetteville man hurt in deadly Louisiana interstate blast"*. TuscaloosaNews.com. Retrieved April 2, 2013.
183. **Jump up^** *"Federal Register | Notice of Lodging of Consent Decree Pursuant to the Clean Water Act"*. Federalregister.gov. February 22, 2010. Retrieved April 2, 2013.
184. **Jump up^** *"Jan. 7, 2008 – ProPublica"*. Retrieved January 15, 2015.
185. **Jump up^** *"Old pipelines are a hidden menace | Energy | Chron.com – Houston Chronicle"*. Chron.com. November 15, 2010. Retrieved April 2, 2013.
186. **Jump up^** *"PHMSA: Stakeholder Communications – Operator Information"*. dot.gov. Retrieved May 23, 2016.

IND 821-1 cont'd

187. **Jump up^** *"No Fatalities From Gas Plant Explosion – NewsChannel5.com | Nashville News, Weather and Sports"*. NewsChannel5.com. Archived from the original on October 29, 2013. Retrieved April 2, 2013.
188. **Jump up^** *"Explosion Reported at South Texas Oil Pipeline"*. Fox News. Retrieved January 18, 2016.
189. **Jump up^** Michler, Caroline. *"Ameren Missouri wrongful death trial set to begin Tuesday"*. Columbia Missourian. Retrieved April 2, 2013.
190. **Jump up^** *"Document 1 DOT Incident Report (manually redacted) Filing Date November 06, 2008 3 page(s) of Text (PDF) Photos"*. Dms.ntsb.gov. Retrieved April 2, 2013.
191. **Jump up^** *"Apex Oil Ordered to Clean Soil, Water Under Illinois Village"*. ENS-Newswire.com. July 29, 2008. Retrieved April 2, 2013.
192. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved April 2, 2013.
193. **Jump up^** Kebede, Rebekah (August 11, 2008). *"Marathon KY refinery cuts rates after pipe leak"*. Reuters.
194. **Jump up^** *"Workers cleaning up Illinois oil spill; crude valued around $525,000 " Evansville Courier and Press"*. Courierpress.com. Archived from the original on October 27, 2013. Retrieved April 2, 2013.
195. **Jump up^** *"PHMSA Stakeholder Communications: Operator Information – Incident and Mileage Data"*. Primis.phmsa.dot.gov. Retrieved April 2, 2013.
196. **Jump up^** *"Gas pipeline fire burns out in Caldwell County"*. Archived from the original on October 5, 2008. Retrieved October 30, 2016.
197. **Jump up^** *"Pipeline Failure Investigation Report"* (PDF). Retrieved October 30, 2016.
198. **Jump up^** Janelle Stecklein (September 10, 2008). *"Gas explosion burns 2"*. Amarillo Globe-News. Retrieved April 2, 2013.
199. **Jump up^** *"CPF No. 1-2008-1004H"* (PDF). Retrieved 27 November 2016.
200. **Jump up^** *"Three Years Later, Residents Moved on After Gas Pipeline Explosi – WSET.com – ABC13"*. WSET.com. September 14, 2011. Retrieved April 2, 2013.
201. **Jump up^** McGurty, Janet (September 24, 2008). *"Longhorn Pipeline stops fuel flow due to fire"*. Reuters.
202. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved April 2, 2013.
203. **Jump up^** JEFF TRENTLY (October 5, 2008). *"Cleanup of oil spill continues"*. NJ.com. Retrieved April 2, 2013.
204. ^ Jump up to: *"PHMSA: Stakeholder Communications – Operator Information"*. dot.gov. Retrieved May 23, 2016.
205. **Jump up^** *"Oct. 3, 2008 – ProPublica"*. Retrieved January 15, 2015.
206. **Jump up^** *"Compressor station blows up"*. Retrieved July 18, 2013. [dead link]
207. **Jump up^** *"Sunoco faces $2.3 million DEP fine for Murrysville pipeline leak"*. TribLIVE.com. Retrieved January 15, 2015.
208. **Jump up^** *"Driver killed as vehicle hits Colon gas pipeline; fire expected to burn all weekend"*. MLive.com. Retrieved May 23, 2016.
209. ^ Jump up to: *"PHMSA: Stakeholder Communications – Operator Information"*. dot.gov. Retrieved May 23, 2016.
210. **Jump up^** *"Failure Investigation Report – Columbia Gas Transmission Well Line Rupture Failure Date: 01/04/2009"* (PDF). Retrieved 27 November 2016.
211. **Jump up^** Loy, Wesley (February 6, 2009). *"Inquiry launched after pump station accident"*. ADN.com. Archived from the original on September 27, 2013. Retrieved April 2, 2013.
212. **Jump up^** *"Gas pipeline explosion near Carthage"*. Archived from the original on September 13, 2014. Retrieved October 30, 2016.
213. **Jump up^** *"UPDATE 1-Explosion near DCP Midstream's Texas natgas plant"*. Reuters. February 11, 2009.
214. **Jump up^** *"Press release by Sunoco Logistics"*. Retrieved 27 November 2016.
215. **Jump up^** *"Ohio, Michigan score among highest for states with oil spills"*. Toledoblade.com. Retrieved April 2, 2013.

IND 821-1 cont'd

216. **Jump up^** *"Pipeline Failure Investigation Report - 2-18-2009" (PDF). Retrieved 27 November 2016.*
217. **Jump up^** *"CPF No. 2-2009-1002H" (PDF). Retrieved 28 November 2016.*
218. **Jump up^** *"CPF No. 3-2009-1009H" (PDF). Retrieved 27 November 2016.*
219. **Jump up^** *"CPF 3-2012-5018" (PDF). Retrieved 28 November 2016.*
220. **Jump up^** *"May 21, 2009 – ProPublica". Retrieved January 15, 2015.*
221. **Jump up^** *"Pipeline accident investigation could take months – KLTV.com-Tyler, Longview, Jacksonville, Texas | ETX News". Kltv.com. Retrieved April 2, 2013.*
222. **Jump up^** *"Pipeline explodes,killed 1 injured 3". www.industrialprojectsreport.com. Retrieved 28 November 2016.*
223. **Jump up^** *"Pipeline and Hazardous Materials Safety Administration - November 2, 2010" (PDF). Retrieved 27 November 2016.*
224. **Jump up^** *"Upton County Gas Line Fire Caused by Leak". Archived from the originalon March 15, 2012. Retrieved October 30, 2016.*
225. **Jump up^** *"Fire rocks plant north of St. Elmo". Effingham Daily News. Retrieved 28 November 2016.*
226. **Jump up^** *"CPF No. 4-2009-1021H" (PDF). Retrieved 27 November 2016.*
227. **Jump up^** *"Home Destroyed In Texas Gas Line Blast". Firefightingnews.com. November 5, 2009. Retrieved April 2, 2013.*
228. **Jump up^** *Kevin Welch; JC Cortez. "Bushland gas release reminds residents of 2009 explosion". Amarillo Globe-News. Retrieved January 19, 2016.*
229. **Jump up^** *"CPF No. 4-2009-1021H" (PDF). Retrieved 27 November 2016.*
230. **Jump up^** *"Columbia Gas Transmission – Adaline Compressor Station Fire Failure Date 11/14/2009" (PDF). Retrieved 28 November 2016.*
231. **Jump up^** *"CPF No. 3-2009-1024H" (PDF). Retrieved 27 November 2016.*
232. **Jump up^** *"CPF No. 3-2009-1024H" (PDF). Retrieved 27 November 2016.*
233. **Jump up^** *Noel Griese. "Energy Pipeline News". Retrieved January 15, 2015.*
234. **Jump up^** *"Dec. 4, 2009 – ProPublica". Retrieved January 15, 2015.*
235. **Jump up^** *"Pipeline leaks 210,000 gallons of oil – www.staplesworld.com – Staples World". Archived from the originalon October 16, 2014. Retrieved January 15, 2015.*
236. **Jump up^** *"Pipeline and Hazardous Materials Safety Administration - September 29, 2010" (PDF). Retrieved 27 November 2016.*
237. **Jump up^** *"PHMSA: Stakeholder Communications". Primis.phmsa.dot.gov. Retrieved April 2, 2013.*
238. **Jump up^** *"CPF No. 3-2010-5001H" (PDF). Retrieved 28 November 2016.*
239. **Jump up^** *"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.*[dead link]
240. **Jump up^** *"A year later, gas line checks continue". StarTribune.com. Retrieved May 14, 2012.*[dead link]
241. **Jump up^** *"History". CrossboreSafety.org. February 9, 1999. Retrieved April 2, 2013.*
242. **Jump up^** *"Highway closed for gas leak " Local news " The Enid News and Eagle, Enid, OK". Enidnews.com. February 25, 2010. Retrieved April 2, 2013.*
243. **Jump up^** *"PHMSA: Stakeholder Communications". Primis.phmsa.dot.gov. Retrieved April 2, 2013.*
244. **Jump up^** Failure Investigation Report – Mid-Valley Pipeline Internal CorrosionPipeline and Hazardous Materials Safety Administration, November 7, 2011, accessed September 5, 2015, 31 pages
245. **Jump up^** *Gamm, Joe (March 16, 2010). "No injuries in gas line rupture north of Pampa". Amarillo Globe-News. Retrieved April 2, 2013.*
246. **Jump up^** *"Failure Investigation Report – Sunoco R&M Flange Gasket 03/25/2010"(PDF). Retrieved 28 November 2016.*
247. ^ Jump up to:[a] [b] *Wilder, Forrest (November 26, 2010). "The Fire Down Below". The Texas Observer. Retrieved April 2, 2013.*
248. **Jump up^** [1][dead link]

INDIVIDUALS
IND821 – K. Kirkbride

IND 821-1 cont'd

249. **Jump up^** "Another Gas Pipeline Explosion in Texas Kills 2 – KFDA – NewsChannel 10 / Amarillo News, Weather, Sports". Newschannel10.com. June 9, 2010. Retrieved April 2, 2013.
250. **Jump up^** "CPF 5-2010-5028" (PDF). Retrieved 28 November 2016.
251. **Jump up^** "Failure Investigation Report – Dixie Pipeline Company 8-inch Propane Pipeline Release 07/05/2010" (PDF). Retrieved 28 November 2016.
252. **Jump up^** "U.S. EPA "EPA Response to Enbridge Spill in Michigan"". Epa.gov. Retrieved April 2, 2013.
253. **Jump up^** "Archived copy". Archived from the original on October 7, 2012. Retrieved May 14, 2012.
254. **Jump up^** "EPA Response to Enbridge Spill in Michigan | US EPA". Epa.gov. Retrieved April 2, 2013.
255. **Jump up^** "U.S. EPA REMOVAL ADMINISTRATIVE ORDER UNDER SECTION 311(c) OF THE CLEAN WATER ACT, REGION 5" (PDF). Retrieved April 2, 2013. [dead link]
256. **Jump up^** "Press Release July 10, 2012". Ntsb.gov. Archived from the originalon April 3, 2013. Retrieved April 2, 2013.
257. **Jump up^** "Plains All American Pipeline Settlement | Compliance and Enforcement | US EPA". Epa.gov. Archived from the original on April 13, 2013. Retrieved April 2, 2013.
258. **Jump up^** Times Staff (August 18, 2010). "Hammond officials deal with oil leak". nwitimes.com. Retrieved May 23, 2016.
259. **Jump up^** Gamm, Joe (August 26, 2010). "Canadian man injured in pipeline accident". Amarillo Globe-News. Retrieved April 2, 2013.
260. **Jump up^** "1 Injured in Gas Compressor Station Explosion | KATC.com | Acadiana-Lafayette, Louisiana". KATC.com. Archived from the original on October 27, 2013. Retrieved April 2, 2013.
261. **Jump up^** "Liquid propane pipeline set to reopen in January " Local News " The Daily Star, Oneonta, NY – otsego county news, delaware county news, oneonta news, oneonta sports". Thedailystar.com. December 17, 2010. Retrieved April 2, 2013.
262. **Jump up^** "CPF No. 1-2010-5008H" (PDF). Retrieved 28 November 2016.
263. **Jump up^** "Failure Investigation Report Enterprise Products Propane Line Crack Failure Date 8/27/2010" (PDF). Retrieved 28 November 2016.
264. **Jump up^** Wittenstein, Jeran (September 10, 2010). "Gas Explosion Engulfs Houses in San Francisco suburb of San Bruno". Bloomberg.com. Retrieved April 2, 2013.
265. **Jump up^** "San Bruno explosion and fire kills 4, destroys 38 homes". Mercurynews.com. September 12, 2010. Retrieved April 2, 2013.
266. **Jump up^** Worth, Katie. "PG&E threatened with fines of $1 million for pipeline data | Katie Worth | Bay Area | San Francisco Examiner". Sfexaminer.com. Archived from the original on May 15, 2013. Retrieved April 2, 2013.
267. **Jump up^** Van Derbeken, Jaxon (October 24, 2011). "PG&E knew of many leaks in San Bruno pipeline". The San Francisco Chronicle.
268. **Jump up^** "Pacific Gas & Electric Pipeline Bursts During Test, Closing Freeway". Huffington Post. November 7, 2011. Archived from the original on November 8, 2011.
269. **Jump up^** "CPF 2-2010-1010S" (PDF). Retrieved 28 November 2016.
270. **Jump up^** "Investigation Report Released for Cairo Gasline Explosion". Wctv.tv. January 5, 2011. Retrieved April 2, 2013.
271. **Jump up^** Shipp, Brett (October 20, 2010). "Pipeline 'pig' crashes through Grand Prairie home | wfaa.com | Dallas – Fort Worth Local News". wfaa.com. Archived from the original on January 26, 2013. Retrieved April 2, 2013.
272. **Jump up^** "Natural gas pipeline ruptures, injures 3 | KATC.com | Acadiana-Lafayette, Louisiana". KATC.com. Archived from the original on August 25, 2013. Retrieved April 2, 2013.
273. **Jump up^** "CPF No. 4-2010-1007H" (PDF). Retrieved 28 November 2016.
274. **Jump up^** "Was Chevron's response too slow? | The Salt Lake Tribune". Sltrib.com. December 3, 2010. Retrieved April 2, 2013.
275. **Jump up^** "Pipeline Discovered Leaking Gasoline". Retrieved May 14, 2012. [dead link]
276. **Jump up^** "Failure Investigation Report – Tennessee Gas Pipeline Co. - Internal Corrosion Failure Date 12/08/2010"(PDF). Retrieved 28 November 2016.
277. **Jump up^** "Gas Line Fire Explosion Critically Burns Man's Face". South Texas: Kiiitv.com. Retrieved April 2, 2013.

IND 821-1 cont'd

278. **Jump up^** *"Long Beach pipeline company charged in oil spill"*. Press-Telegram. Retrieved April 2, 2013.
279. **Jump up^** *"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.
280. **Jump up^** *"CPF 1-2011-1013S"* (PDF). Retrieved 28 November 2016.
281. **Jump up^** *"Failure Investigation Report - Columbia Gas Transmission, Millennium Pipeline Weld Anomaly Failure Date 01/11/2011"* (PDF). Retrieved 28 November 2016.
282. **Jump up^** *"2nd UPDATE: Philadelphia Gas-Line Blast Kills One, Hurts Six"*. Archived from the original on January 23, 2011. Retrieved October 30, 2016.
283. ^ Jump up to:a b *"Page has moved"*. Retrieved January 15, 2015.
284. **Jump up^** *"Fairport Harbor blasts probed"*. news-herald.com. February 2, 2011. Retrieved April 2, 2013.
285. **Jump up^** *"Lawsuit filed over natural gas fires in Fairport Harbor"*. Newsnet5.com. Associated Press. Archived from the original on March 9, 2012. Retrieved April 2, 2013.
286. **Jump up^** *"Dominion officials respond to Fairport residents"*. news-herald.com. October 19, 2011. Retrieved April 2, 2013.
287. **Jump up^** *"Puco Staff Report Fire Investigation"*. Retrieved May 14, 2012.[dead link]
288. **Jump up^** *"Five Killed in Pennsylvania Gas Explosion"*. Archived from the original on February 21, 2011. Retrieved October 30, 2016.
289. **Jump up^** *"UGI told years ago to remove old pipes"*. Archived from the original on October 2, 2012. Retrieved October 30, 2016.
290. **Jump up^** *Allentown Explosion*. February 10, 2011. Retrieved January 19, 2016 – via YouTube.
291. **Jump up^** *"UGI cited for multiple safety violations leading to Allentown gas explosion | Regional: Lehigh Valley – Home"*. Wfmz.com. June 11, 2012. Retrieved April 2, 2013.
292. **Jump up^** *"Huge Natural Gas Explosion Near Lisbon – 33 News – We Believe in This Valley"*. Wytv.com. Archived from the original on March 25, 2012. Retrieved April 2, 2013.
293. **Jump up^** *"Cause of explosion in Hanover Township determined – 21 News Now, More Local News for Youngstown, Ohio"*. Wfmj.com. Retrieved April 2, 2013.
294. **Jump up^** *"CPF No. 3-2011-1001S"* (PDF). Retrieved 28 November 2016.
295. **Jump up^** *"Ruptured line held 250,000 gallons of gasoline"*. Archived from the originalon March 23, 2012. Retrieved October 30, 2016.
296. **Jump up^** *"About 5,000 gallons of fuel spilled, TCEQ says"*. Archived from the original on March 23, 2012. Retrieved October 30, 2016.
297. **Jump up^** *"PHMSA: Stakeholder Communications"*. DOT.gov. Retrieved April 2, 2013.
298. **Jump up^** *"CPF No. 3-2011-1018H"* (PDF). Retrieved 28 November 2016.
299. **Jump up^** *"PHMSA: Stakeholder Communications - Operator Information"*. primis.phmsa.dot.gov. Retrieved October 5, 2016.
300. **Jump up^** David Joles. *"Light 'like the sun' rose above Mpls. blast crater"*. StarTribune.com. Retrieved April 2, 2013.
301. **Jump up^** *"Report ID's Cause of Windom Pipeline Explosion"*. Southwest Minneapolis, Minnesota Patch. Retrieved January 15, 2015.
302. **Jump up^** *"Company Continues Probe into Mid-Michigan Gas Leak"*. archive.is. 28 November 2016. Retrieved 28 November 2016.
303. **Jump up^** *"CPF No. 3-2011-5006H"* (PDF). Retrieved 28 November 2016.
304. **Jump up^** *"CPF No. 3-2011-5008S"* (PDF). Retrieved 28 November 2016.
305. **Jump up^** McGurty, Janet (January 20, 2011). *"UPDATE 2-Sunoco shuts Oklahoma crude line after Weds. leak"*. Reuters.
306. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved January 15, 2015.
307. **Jump up^** *"Archived copy"*. Archived from the original on September 2, 2012. Retrieved May 14, 2012.
308. **Jump up^** O'Connor, Anahad (July 2, 2011). *"Ruptured Pipeline Spills Oil Into Yellowstone River"*. The New York Times.

IND 821-1 cont'd

309. **Jump up^** *"Laurel residents evacuate after oil pipeline break"*. KTVQ.com. Archived from *the original* on October 26, 2014. Retrieved January 15, 2015.
310. **Jump up^** *"Exxon Oil Spill in Montana River Prompts Evacuations"*. Fox News. July 3, 2011.
311. **Jump up^** *"Exxon oil spill prompts evacuations"*. The Washington Post. July 3, 2011. [dead link]
312. **Jump up^** *"Greenspace"*. Los Angeles Times. July 3, 2011.
313. ^ Jump up to: a b *"ExxonMobil pipe spills oil into Yellowstone River"*. msnbc.com. Retrieved January 19, 2016.
314. **Jump up^** *"Exxon: Yellowstone spill 1,500 barrels, not 1,000"*. Fox News. January 19, 2012.
315. **Jump up^** *"Lawsuits against Exxon Mobil mount over big oil pipeline spills"*. Retrieved January 15, 2015.
316. **Jump up^** *"Montana DEQ – Page Not Found"*. Archived from *the original* on January 28, 2015. Retrieved January 15, 2015.
317. **Jump up^** *"Exxon Mobil gets $1 million penalty for pipeline spill"*. Daily Inter Lake. Retrieved January 18, 2016.
318. **Jump up^** *"Wyoming nat gas pipeline out of commission"*. UPI. Retrieved January 15, 2015.
319. **Jump up^** *"Quality concerns arose before TransCanada pipeline blast"*. CBC News.
320. **Jump up^** *"Archived copy"*. Archived from *the original* on March 28, 2012. Retrieved May 14, 2012.
321. **Jump up^** *"CPF No. 3-2011-5010H" (PDF)*. Retrieved 28 November 2016.
322. **Jump up^** *"CPF No. 3011-5009H" (PDF)*. Retrieved 28 November 2016.
323. **Jump up^** *"Pipeline Leak Sends Gasoline Into Missouri River"*. Associated Press. Retrieved January 15, 2015.
324. **Jump up^** *"Mid-America Pipeline Company and Enterprise Products Operating to Pay $1 Million for Spills in Iowa, Kansas and Nebraska – OPA – Department of Justice"*. Retrieved January 15, 2015.
325. **Jump up^** *"Kinder Morgan, Owner of Illinois Natural Gas Pipeline Co. Where Explosion Occurred, Has Lengthy Record of Pipeline, Workplace Safety Violations – Natural Gas Watch.org"*. Retrieved January 15, 2015.
326. **Jump up^** *"HazardEx – Gas plant explosion injures five"*. Retrieved January 15, 2015.
327. **Jump up^** *"Providence Journal – Rhode Island news, sports, weather and more"*. Archived from *the original* on October 16, 2011. Retrieved January 15, 2015.
328. **Jump up^** Van Derbeken, Jaxon (October 17, 2011). *"Plastic natural gas pipe failure data kept secret"*. The San Francisco Chronicle.
329. **Jump up^** *"Failure Investigation Report – Chevron Coahoma LPG Loop Failure Date 9/8/2011" (PDF)*. Retrieved 28 November 2016.
330. **Jump up^** *"Ruptured gasoline pipeline fixed in Aurelius; testing of nearby private wells continues"*. syracuse.com. Retrieved January 15, 2015.
331. **Jump up^** McGurty, Janet (October 24, 2011). *"Blueknight reopens Oklahoma crude line after leak"*. Reuters.
332. **Jump up^** *"Link to video of Artemas gas explosion at bottom of page"*. The Cumberland Times-News. Retrieved January 18, 2016. [dead link]
333. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved January 15, 2015.
334. **Jump up^** *"Vectren agrees to $75,000 settlement in 2011 gas explosion"*. News and Tribune. Retrieved January 18, 2016.
335. **Jump up^** *"Missing Man Found Dead After Deadly Ohio House Explosion"*. Fox News. November 13, 2011.
336. **Jump up^** *"CPF No. 3-2011-IOISH" (PDF)*. Retrieved 28 November 2016.
337. **Jump up^** *"Nov. pipeline blast leaves lasting impact on lives - MariettaTimes.com - News, Sports, Jobs, Ohio, Community Information - The Marietta Times"*. mariettatimes.com. Retrieved September 16, 2016.
338. **Jump up^** *"CPF No. 2-2011-IOIOH" (PDF)*. Retrieved 28 November 2016.
339. **Jump up^** *"Pipeline explodes in Marengo County, causes massive fire"*. wsfa.com. December 3, 2011. Retrieved January 18, 2016.
340. **Jump up^** *"CPF No. 2-2011-IOIIH" (PDF)*. Retrieved 28 November 2016.

IND 821-1 cont'd

341. **Jump up^** *"Corrosion cited in pipeline explosion – The Demopolis Times"*. Retrieved January 15, 2015.
342. **Jump up^** JEREMY FUGLEBERG. *"Two suffer injuries due to fire at Wyoming natural gas site"*. Casper Star-Tribune Online. Retrieved January 15, 2015.
343. **Jump up^** *"Magellan: Pipeline fixed near Nemaha, fuel pumping resumes"*. JournalStar.com. Retrieved January 15, 2015.
344. **Jump up^** ALGIS J. LAUKAITIS / Lincoln Journal Star. *"Pipeline fixed near Nemaha; fuel pumping resumes"*. JournalStar.com. Retrieved January 15, 2015.
345. **Jump up^** Paul Burkhardt. *"Magellan Reduces Nebraska Line Spill Estimate to 2,834 Barrels"*. Businessweek.com. Archived from the original on October 28, 2013. Retrieved January 15, 2015.
346. **Jump up^** *"El Paso says no estimate for Return of Ruby gas line in Utah"*. Denver Post. December 12, 2011.
347. **Jump up^** *"Ruby Pipeline LLC :: Informational Postings"*. Retrieved January 15, 2015.
348. **Jump up^** *"Failure Investigation Report – Enterprise Products Operating LLC – Girth Weld Failure 12/27/2011"* (PDF). Retrieved 28 November 2016.
349. **Jump up^** *"Archived copy"*. Archived from the original on January 6, 2012. Retrieved May 14, 2012.
350. **Jump up^** *"Failure Investigation Report – Columbia Gulf Transmission, Line 200 Rupture in Estill County, Kentucky Failure Date - January 2, 2012"*(PDF). Retrieved 28 November 2016.
351. **Jump up^** [2][dead link]
352. **Jump up^** *"Man feared dead in home explosion had hoped to move near son"*. Retrieved January 15, 2015.
353. **Jump up^** *"Wellington: Families still evacuated after massive pipeline spill"*. January 13, 2012. Retrieved January 15, 2015.[dead link]
354. **Jump up^** *"Wellington may have answers in the coming weeks"*. newsnet5. Archived from the original on October 27, 2013. Retrieved January 15, 2015.
355. **Jump up^** *"No injuries, damage after gas line explodes in Rio Vista"*. Retrieved January 15, 2015.
356. **Jump up^** *"Archived copy"*. Archived from the original on January 19, 2012. Retrieved May 14, 2012.
357. **Jump up^** *"Cortlandt contractor in gas explosion may lack enough insurance, lawyer for homeowners says"*. The Journal News – lohud.com. Archived from the original on February 23, 2015. Retrieved January 15, 2015.
358. **Jump up^** *"Jan. 18, 2012 – ProPublica"*. Retrieved January 15, 2015.
359. **Jump up^** Giang Nguyen; Marques White. *"Details About Victim Of Home Explosion Released"*. Retrieved January 15, 2015.
360. **Jump up^** Stephanie Ramos-Tomeoni. *"Home Explosion Victim Dies"*. Retrieved January 15, 2015.
361. **Jump up^** *"Jet Fuel Leaks For 2 Weeks Into Sewer"*. WISN. Retrieved January 15, 2015.
362. **Jump up^** Bruce Vielmetti. *"Former Shell Pipeline monitor to plead guilty in airport leak"*. Retrieved January 15, 2015.
363. **Jump up^** *"CPF No. 4-2013-1014H"* (PDF). Retrieved 28 November 2016.
364. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved January 15, 2015.
365. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved January 15, 2015.
366. **Jump up^** *"2 killed by Ill. oil pipeline explosion"*. FireRescue1.com. Retrieved January 15, 2015.
367. **Jump up^** *"Late-night car race that caused pipeline fire rare, not unique"*. Reuters. March 7, 2012.
368. **Jump up^** news, Tulsa World: Tulsa; sports; business; entertainment; weather. *"Tulsa World"*. tulsaworld.com. Retrieved September 16, 2016.
369. **Jump up^** *"Officials finish cleaning crude from leaky pipeline in Barataria Bay"*. NOLA.com. Retrieved January 15, 2015.

IND 821-1 cont'd

370. **Jump up^** *"Northern Pennsylvania gas explosion was out of regulatory reach"*. Philly.com. Retrieved January 15, 2015.
371. **Jump up^** Laura Legere. *"Explosion rocks natural gas compressor station"*. Retrieved January 15, 2015.
372. **Jump up^** *"Williams Gas Pipeline-Transco: North Bergen, NJ, 72nd Street Interstate Trans Lateral Leak Failure Date: 4/2/2012"*(PDF). Retrieved 28 November 2016.
373. **Jump up^** Amy Tatum (April 4, 2012). *"Pipeline explodes near Carthage"*. kcentv.com. Retrieved January 18, 2016.
374. **Jump up^** *"In brief: Repairs continue on leaking line"*. MCA. Archived from the original on October 28, 2013. Retrieved January 15, 2015.
375. **Jump up^** *"Natural gas pipeline ruptures, sending flames soaring in Terrebonne Parish marshes"*. NOLA.com. Retrieved January 15, 2015.
376. **Jump up^** *"Northern Natural Gas: Men did not check for pipeline"*. ktiv.com. April 26, 2012. Retrieved January 18, 2016.
377. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved January 15, 2015.
378. **Jump up^** *"CPF No. 4-2012-5019H"* (PDF). Retrieved 28 November 2016.
379. **Jump up^** *"ExxonMobil Pipeline Company To Pay Civil Penalty Under Proposed Settlement For Torbert Louisiana Oil Spill Settlement Resolves Clean Water Act Violation Stemming From 2012 Spill"*. Retrieved January 15, 2015.
380. **Jump up^** *"CPF No. 4-2012-1011H"* (PDF). Retrieved 28 November 2016.
381. **Jump up^** [3][dead link]
382. **Jump up^** *"HazardEx – BP gas compressor station explosion in Colorado kills one"*. Retrieved January 15, 2015.
383. **Jump up^** *"Archived copy"*. Archived from the original on February 1, 2013. Retrieved January 24, 2013.
384. **Jump up^** Don Behm. *"Tests reveal chemicals in 23 more Jackson wells"*. Retrieved January 15, 2015.
385. **Jump up^** Don Behm. *"Fuel company seeks to divert Cedar Creek for pipeline fixes"*. Retrieved January 15, 2015.
386. **Jump up^** Don Behm. *"Fuel pipeline repairs force closure of parts of Jackson Marsh"*. Retrieved January 15, 2015.
387. **Jump up^** Don Behm. *"Large gasoline spill linked to benzene in Village of Jackson well"*. Retrieved January 15, 2015.
388. **Jump up^** *"Archived copy"*. Archived from the original on August 15, 2012. Retrieved July 20, 2012.
389. **Jump up^** *"This Week In Natural Gas Leaks and Explosions – July 30, 2012 – Natural Gas Watch.org"*. Retrieved January 15, 2015.
390. **Jump up^** *"Lightning Causes Compressor Explosion"*. Retrieved January 15, 2015.
391. **Jump up^** *"UPDATE 4-Enbridge to replace leaky Wisconsin oil pipeline Monday"*. Reuters. July 29, 2012.
392. **Jump up^** Jeremy Fugleberg. *"Four burned in Lost Cabin gas plant flash fire"*. Casper Star-Tribune Online. Retrieved January 15, 2015.
393. **Jump up^** *"Jet Fuel Spill Near Chicago Closes Canal, Highway"*. Retrieved January 15, 2015.
394. **Jump up^** *"CPF No. 3-2012-5019H"* (PDF). Retrieved 28 November 2016.
395. **Jump up^** *"Pipeline in Palos Park Was Corroded: Company Rep"*. Palos, Illinois Patch. Retrieved January 15, 2015.
396. **Jump up^** *"Gas Line Fire Snuffed Out"*. NBC 10 Philadelphia. Retrieved January 15, 2015.
397. **Jump up^** *"Gas line explosion in McKinney leaves four injured, 1,000 without gas"*. The Scoop Blog. Retrieved January 15, 2015.
398. **Jump up^** *"Production impact 'minimal' from pipe blast"*. Retrieved January 15, 2015.
399. **Jump up^** *"Cause of Sept. 6 explosion at gas plant still being investigated"*. Retrieved January 15, 2015.
400. **Jump up^** *"Colorado Interstate Gas sets force majeure after compressor fire"*. Reuters. September 12, 2012.

IND 821-1 cont'd

401. **Jump up^** *"Archived copy" (PDF). Archived from the original (PDF) on April 8, 2013. Retrieved September 20, 2012.*
402. **Jump up^** *"Natural gas line struck by excavator near Orange County Airport". recordonline.com. Retrieved January 15, 2015.*
403. **Jump up^** *"Gas explosion lights the sky in downtown Lewiston". Idaho Press-Tribune. Retrieved January 15, 2015.*
404. **Jump up^** *"OSHA Fines Company Over Natural Gas Explosion". Retrieved January 15, 2015.*
405. **Jump up^** *Aaron Clark. "BP Chicap Pipe Spilled Oil at Illinois Tank Farm, Filing Shows". Businessweek.com. Archived from the original on October 28, 2013. Retrieved January 15, 2015.*
406. **Jump up^** *"2 workers hurt in natural gas explosion near Price". NewsOK.com. Retrieved January 15, 2015.*
407. **Jump up^** *"Claims for losses in Springfield explosion continue to mount". masslive.com. Retrieved January 15, 2015.*
408. **Jump up^** *"Hwy 99 reopens after a Madera County gas leak". ABC30 Fresno. Retrieved January 15, 2015.*
409. **Jump up^** *"Pipeline Safety and Injuries | Explosion Burn Death Lawyers Hill Law Firm". 22 January 2013. Retrieved 28 November 2016.*
410. **Jump up^** *"Pipe explodes near Goldsmith plant". Odessa American. Retrieved January 15, 2015.*
411. **Jump up^** *"WV explosion highlights pipeline safety". statejournal.com. December 12, 2012. Retrieved January 18, 2016.*
412. **Jump up^** *"PHOTOS: West Virginia Gas Line Explodes, Sends Flames Up To 75 Feet In The Air". Huffington Post. December 11, 2012. Archived from the original on December 12, 2012.*
413. **Jump up^** *"UPDATED: Gas line explodes, burns homes and roads". Beckley Register-Herald. Retrieved January 18, 2016.* [dead link]
414. **Jump up^** [4] [dead link]
415. **Jump up^** *"CPF No. 2-2012-1005H" (PDF). Retrieved 28 November 2016.*
416. **Jump up^** *"Investigation of deadly Lewisville explosion continues". Retrieved January 15, 2015.*
417. **Jump up^** *"Cable Contractor Involved in KC Gas Explosion". Retrieved January 15, 2015.*
418. **Jump up^** *"OSHA cites drilling company in fatal explosion at JJ's restaurant". kansascity. Retrieved January 15, 2015.*
419. **Jump up^** *"Fire erupts after tug hits Chevron LPG pipeline: Coast Guard". Reuters. March 13, 2013.*
420. **Jump up^** *"Tug captain Chad Breaux dies of burns after Louisiana gas explosion". UPI. Retrieved January 15, 2015.*
421. **Jump up^** *"Settlement reached in 2013 Columbia County case of 6,000-barrel oil spill from pipeline". Magnolia Reporter – Magnolia, Arkansas News. Retrieved May 23, 2016.*
422. **Jump up^** *"Utah Local News – Salt Lake City News, Sports, Archive – The Salt Lake Tribune". Retrieved January 15, 2015.*
423. **Jump up^** *"CPF No. 5-2013-5006H" (PDF). Retrieved 28 November 2016.*
424. **Jump up^** *"UPDATE 1-Williams natgas line ruptures in West Virginia". Reuters. March 22, 2013.*
425. **Jump up^** *Visser, Nick (April 9, 2013). "Maddow Slams Exxon's 'Paper Towel' Cleanup Efforts". Huffington Post.*
426. **Jump up^** *"Web Extra: Background on Pipeline that Ruptured Near Mayflower". Retrieved January 15, 2015.*
427. **Jump up^** [5] [dead link]
428. **Jump up^** *"Exxon: Cause of pipeline failure 'manufacturing defects'". Thv11.com. July 10, 2013. Archived from the original on October 28, 2013. Retrieved January 15, 2015.*
429. **Jump up^** *"Employee ran 1 mile to escape Guthrie natural gas explosion". koco. Retrieved January 15, 2015.*
430. **Jump up^** [6] [dead link]
431. **Jump up^** *"Archived copy". Archived from the original on July 14, 2013. Retrieved April 16, 2013.*

IND 821-1 cont'd

432. **Jump up^** *"Exxon says Missouri oil spills from already-ruptured Pegasus line"*. Reuters. May 1, 2013.
433. **Jump up^** *"Report: Copper wire to blame for 2013 20K-gallon pipeline leak on nor…"*. archive.is. 28 November 2016. Retrieved 28 November 2016.
434. **Jump up^** *"DEP: Compressor stations shows signs of explosion"*. Retrieved January 15, 2015.
435. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved January 15, 2015.
436. **Jump up^** *"Skytruth Alert: NRC Report: Natural Gas near Crockett, TX 2013-05-08"*. SkyTruth Alerts. Retrieved January 15, 2015.
437. **Jump up^** *"News – MyCentralJersey.com – mycentraljersey.com"*. MyCentralJersey.com. Archived from the original on October 24, 2014. Retrieved January 15, 2015.
438. **Jump up^** *"CPF No. 5-2013-1007H"* (PDF). Retrieved 28 November 2016.
439. **Jump up^** *"Gas line explosion rattles Washington Parish | Home | The Advocate — …"*. archive.is. 3 October 2014. Retrieved 28 November 2016.
440. **Jump up^** *"Observer-Reporter – Blaze hits compressor station in Gilmore Township"*. Observer-Reporter. Retrieved January 15, 2015.
441. **Jump up^** Kathy Antoniotti. *"City not privy to pipeline locations inside own borders"*. www.ohio.com. Retrieved January 15, 2015.
442. **Jump up^** *"Downed Wires Lead To Car Fires, Ruptured Gas Line In Mamaroneck " CBS New York"*. Retrieved January 15, 2015.
443. **Jump up^** *"Crews Work To Contain BP Pipeline Leak In Osage County"*. newson6.com. July 26, 2013. Retrieved January 18, 2016.
444. **Jump up^** [7][dead link]
445. **Jump up^** *"Search Results – KEYE-TV Austin"*. Archived from the original on August 27, 2013. Retrieved January 15, 2015.
446. **Jump up^** *"Update to gas explosion in Overland Park"*. fox4kc.com. Retrieved January 15, 2015.
447. **Jump up^** *"Gas line not yet repaired after explosion in Buna"*. Beaumont Enterprise. Retrieved January 15, 2015.
448. **Jump up^** *"City worker hits gas line"*. Retrieved January 15, 2015.
449. **Jump up^** *"Corrosion may have led to North Dakota pipeline leak: regulator"*. Yahoo! News. October 11, 2013. Retrieved January 15, 2015.
450. **Jump up^** *"Archived copy"*. Archived from the original on June 15, 2015. Retrieved June 14, 2015.
451. **Jump up^** *"No Injuries Reported After Pipeline Explosion in Howard County"*. newswest9.com. October 7, 2013. Retrieved January 18, 2016.
452. **Jump up^** *"(With video and three photos) Oil spill cleanup continues along Horsehead Creek tributary near Macedonia"*. Magnolia Reporter – Magnolia, Arkansas News. Retrieved January 15, 2015.
453. **Jump up^** *"Resident Describes Gas Line Explosion In Harper County"*. news9.com. October 9, 2013. Retrieved January 18, 2016.
454. **Jump up^** *"Pipeline explosion shoots flames into Oklahoma sky"*. The Christian Science Monitor. Retrieved January 15, 2015.
455. **Jump up^** *"CPF No. 4-2013-1016H"* (PDF). Retrieved 28 November 2016.
456. **Jump up^** *"Archived copy"*. Archived from the original on October 31, 2013. Retrieved October 30, 2013.
457. **Jump up^** *"Small Town Residents Allowed To Return After Fiery Blast"*. Retrieved January 15, 2015.
458. **Jump up^** *"UPDATE 4-Chevron pipeline explodes, burns in rural Texas"*. Reuters. November 14, 2013.
459. **Jump up^** *"CPF 4-2014-5012"* (PDF). Retrieved 28 November 2016.
460. **Jump up^** *"ExxonMobil's King Ranch Gas Plant Continues Burning – KiiiTV.com South Texas, Corpus Christi, Coastal Bend"*. kiiitv.com. November 18, 2013. Retrieved January 18, 2016.
461. **Jump up^** *"Gas Pipeline Rupture Send Flames 100 Feet Into Air"*. BigCountryHomepage. Associated Press. Archived from the original on October 23, 2014. Retrieved January 15, 2015.

IND 821-1 cont'd

462. **Jump up^** *"Pipeline explosion sends fireball 300 feet into air"*. fox4kc.com. Retrieved January 15, 2015.
463. **Jump up^** *"Archived copy"*. Archived from the original on December 13, 2013. Retrieved December 10, 2013.
464. **Jump up^** *"PHMSA: Stakeholder Communications"*. Primis.phmsa.dot.gov. Retrieved January 15, 2015.
465. **Jump up^** *"480 tons of soil removed from site of winter gas leak"*. Retrieved January 15, 2015.
466. **Jump up^** *"Lawsuit Filed over Gasoline Leak"*. highbeam.com. Retrieved January 18, 2016.
467. **Jump up^** *"Crews respond to gas-line fire in Shrewsbury"*. Retrieved January 15, 2015.
468. **Jump up^** *"Ashevill gas line explosion costs $825,000"*. The Asheville Citizen-Times. Retrieved January 15, 2015. [dead link]
469. **Jump up^** *"Archived copy"*. Archived from the original on February 22, 2014. Retrieved February 13, 2014.
470. **Jump up^** Marcus Green (September 18, 2014). *"Analysis: Existing cracks a cause in Kentucky pipeline blast"*. WorldNow and WDRB.
471. **Jump up^** *"Ky. gas line blast injures 2, destroys 2 homes"*. Archived from the originalon February 22, 2014. Retrieved October 30, 2016.
472. **Jump up^** *"Boy killed as house collapsed was planning to attend birthday party - Natural Gas Watch.org"*. naturalgaswatch.org. Retrieved September 16, 2016.
473. **Jump up^** *"America's aging pipelines - CNN Video"*. cnn.com. Retrieved September 16, 2016.
474. **Jump up^** *"Archived copy"*. Archived from the original on March 10, 2014. Retrieved March 10, 2014.
475. **Jump up^** *"NTSB: Abnormal Concentration Of Gas Found Near East Harlem Blast Scene"*. CBS New York. Retrieved January 15, 2015.
476. **Jump up^** *"Oil spill cleanup ending; 20 salamanders being cared for off-site"*. WLWT.com. Retrieved January 15, 2015.
477. **Jump up^** *"CPF No. 3-2014-5002H"* (PDF). Retrieved 28 November 2016.
478. **Jump up^** *"Arvin still in the dark about leaking gas line"*. The Bakersfield Californian. Retrieved January 15, 2015.
479. **Jump up^** *"Massive Explosion Rocks Washington State Natural Gas Plant"*. thinkprogress.com. March 31, 2014. Retrieved January 15, 2015.
480. **Jump up^** *"Archived copy"*. Archived from the original on July 1, 2014. Retrieved June 23, 2014.
481. **Jump up^** *"Company won't be cited for W.Va. pipeline blast"*. Archived from the original on September 13, 2014. Retrieved October 30, 2016.
482. **Jump up^** *"Natural gas line ruptures in Union Township; man taken to hospital"*. The Newark Advocate. April 17, 2014. Archived from the original on October 6, 2014. Retrieved January 15, 2015.
483. **Jump up^** *"Archived copy"*. Archived from the original on May 17, 2014. Retrieved May 15, 2014.
484. **Jump up^** *"Fire still burns at damaged Wyoming gas plant"*. Casper Star-Tribune Online. Associated Press. Retrieved January 15, 2015.
485. **Jump up^** *"Pipeline Rupture, Hazardous Material Spill in Knox"*. nemonews.net. Retrieved January 15, 2015.
486. **Jump up^** *"Gas line ruptures, 150-foot geyser of gas spews onto workers"*. WYFF4. May 13, 2014. Retrieved January 15, 2015.
487. **Jump up^** *"Port St. John gas line rupture under investigation"*.
488. **Jump up^** *"PHMSA: Stakeholder Communications – Operator Information"*. Primis.phmsa.dot.gov. Retrieved January 19, 2016.
489. **Jump up^** *"Wharton County gas line explosion sends 150-foot flames up in air"*. ABC13 Houston. May 13, 2014. Retrieved January 15, 2015.
490. **Jump up^** *"Susquehanna County compressor station shut down after morning fire"*. Times Leader. July 10, 2014. Archived from the original on October 21, 2014. Retrieved January 15, 2015.
491. **Jump up^** Felicia Cummings, "Gas leak near Midway Elementary," The Union-Recorder, July 23, 2014 4:15 pm | Updated: August 7, 2014.

IND 821-1 cont'd

492. **Jump up^** *"Crews contain oil spill near Santa Maria"*. KSBY.com. August 4, 2014. Archived from the original on February 5, 2015. Retrieved January 15, 2015.
493. **Jump up^** *"White Oak man killed in Rusk Co. pipeline explosion"*. Archived from the original on February 22, 2015. Retrieved January 15, 2015.
494. **Jump up^** *"Four hurt after natural gas line catches fire near Lindsay"*. Tulsa World. Retrieved January 15, 2015.
495. **Jump up^** Lynn Cook (September 15, 2014). *"Chevron Shuts Gas Pipeline After Worker Dies in Gulf of Mexico Accident – WSJ"*. WSJ. Retrieved January 15, 2015.
496. **Jump up^** *"TransCanada Pipeline Rupture Prompts Evacuation Of Benton Harbor"*. The Huffington Post. Retrieved January 15, 2015.
497. **Jump up^** *"TransCanada: After pipeline rupture, repairs may take several weeks"*. wsbt.com. Retrieved January 15, 2015.
498. **Jump up^** Chris Oberholtz (October 13, 2014). *"Emergency crews respond to pipeline rupture, fire near Centervie – KCTV5"*. kctv5.com. Retrieved January 18, 2016.
499. **Jump up^** Vickie Welborn (October 18, 2014). *"Crude oil spills into Caddo bayou, kills wildlife"*. Retrieved January 15, 2015.
500. **Jump up^** *"Roads open, repairs underway after gas leak"*. kait8.com. October 22, 2014. Retrieved January 18, 2016.
501. **Jump up^** *"Blue Racer Pipeline Shut Down After Explosion - News, Sports, Jobs - The Intelligencer"*. theintelligencer.net. Retrieved September 16, 2016.
502. **Jump up^** *"CPF 2-2015-5001S" (PDF)*. Retrieved 28 November 2016.
503. **Jump up^** *"Kinder Morgan pipeline leak reaches 300,000 gallons in South Carolina"*. savannahnow.com. Retrieved January 19, 2016.
504. **Jump up^** *"US Evangeline Pipeline shuts down after leak discovered"*. Retrieved January 15, 2015.
505. **Jump up^** *"News – Argus Media"*. Retrieved January 15, 2015.
506. **Jump up^** *"CPF No.: 4-2014-5027H" (PDF)*. Retrieved 28 November 2016.
507. **Jump up^** *"Gas line explodes, burns near reservoir"*. WAPT News. January 14, 2015. Retrieved January 15, 2015.
508. **Jump up^** *"Reservoir gas pipeline fire extinguished"*. The Clarion-Ledger. January 14, 2015. Retrieved January 15, 2015.
509. **Jump up^** *"CPF 2-2015-1001S" (PDF)*. Retrieved 28 November 2016.
510. ^ Jump up to:[a] [b] [c] [d] [e] [f] [g] [h] [i] Pipeline and Hazardous Materials Safety Administration operator data, http://primis.phmsa.dot.gov., Retrieved April 1, 2016.
511. **Jump up^** Sider, Alison. *"Oil Spill Contaminates Montana Town's Water Supply, EPA Says"*.
512. **Jump up^** Tom Lutey. *"Clean water likely to be restored to Glendive on Thursday after oil spill along Yellowstone"*. INFORUM. Retrieved January 18, 2016.
513. **Jump up^** *"PHMSA: Stakeholder Communications – Operator Information"*. dot.gov. Retrieved May 23, 2016.
514. **Jump up^** *"PHMSA: Stakeholder Communications – Operator Information"*. dot.gov. Retrieved May 23, 2016.
515. **Jump up^** *"Pipeline fire shuts down FM 2004 in Texas City"*. The Galveston County Daily News. Retrieved January 18, 2016.
516. **Jump up^** *"24,000 Ethane Barrels Burned - News, Sports, Jobs - The Intelligencer"*. theintelligencer.net. Retrieved September 16, 2016.
517. **Jump up^** *"Breaking January Sees Five Major Pipeline Leaks"*. Al Jazeera America. Retrieved January 19, 2016.
518. **Jump up^** *"Pipeline Ruptures Near Pike 43 | The People's Tribune"*. thepeoplestribune.com. Retrieved 28 November 2016.
519. **Jump up^** Operator Information, Pipeline & Hazardous Materials Safety Administration, http://primis.phmsa.dot.gov.
520. **Jump up^** Marcus Green (April 8, 2015). *"Jet fuel remains in Shively soil months after pipeline spill"*. wdrb.com. Retrieved January 18, 2016.
521. **Jump up^** Marcus Green (November 4, 2015). *"More than 2,500 tons of soil removed from Shively neighborhood a – WDRB 41 Louisville News"*. wdrb.com. Retrieved January 18, 2016.
522. **Jump up^** *"CPF No. 4-2015-5005H" (PDF)*. Retrieved 28 November 2016.

IND 821-1 cont'd

523. **Jump up^** *"Cleanup begins on diesel pipeline spill near Tehuacana Creek"*. WacoTrib.com. Retrieved January 18, 2016.
524. **Jump up^** *"'Heavy Rains' Cited In Marshall Pipeline Failure - News, Sports, Jobs - The Intelligencer"*.
525. **Jump up^** *"DEP: 132 Barrels Spilled Into Marshall County Creek - News, Sports, Jobs - The Intelligencer"*. theintelligencer.net. Retrieved September 16, 2016.
526. **Jump up^** *"Natural gas pipeline fire near Borger extinguished"*. Retrieved 28 November 2016.
527. **Jump up^** *"Pipeline explosion at Fresno shooting range caused by front loader, state report says"*. Retrieved August 21, 2015.
528. **Jump up^** Paul Vercammen; Pat St. Claire (May 20, 2015). *"California oil spill: Up to 105,000 gallons lost – CNN.com"*. CNN. Retrieved January 18, 2016.
529. **Jump up^** *"Failure Investigation Report], (PDF)Plains Pipeline, L.P., Line 901, Crude Oil Release, May 19, 2015, Santa Barbara County, California; May 2016"*.
530. **Jump up^** *"Arkansas River pipeline blowout occurred on Sunday morning, cause still unknown"*. Retrieved August 21, 2015.
531. **Jump up^** *"Natural gas pipeline ruptures east of I-30 bridge, closing two miles of Arkansas River"*. Retrieved August 21, 2015.
532. **Jump up^** *"Williams natgas pipeline in Pennsylvania ruptures; no injuries"*. Reuters. June 11, 2015. Retrieved August 21, 2015.
533. **Jump up^** *"Failure Investigation Report – Williams Partners L.P./Transco 24" Leidy Line B Failure, Unityville, PA 6/9/2015" (PDF)*. Retrieved 28 November 2016.
534. **Jump up^** *"Pipeline rupture released thousands of pounds of gas vapors"*. victoriaadvocate.com. Retrieved January 18, 2016.
535. **Jump up^** *"Texas 225 eastbound reopens after a truck collision with feeder road pipeline shut it down"*. Houston Chronicle. June 22, 2015. Retrieved December 8, 2015.
536. **Jump up^** *"4 Injured in White Deer Gas Line Explosion"*. NBC 5 Dallas-Fort Worth. Retrieved January 18, 2016.
537. **Jump up^** *"Highland resident files suit against oil company responsible for spill"*. bnd. Retrieved January 18, 2016.
538. **Jump up^** Sheldon Ingram (July 29, 2015). *"2 workers hurt in explosion when backhoe strikes gas line"*. WTAE. Retrieved January 18, 2016.
539. **Jump up^** *"Sheriff's Office: Natural gas pipeline 'explosion' forced 150 Falfurrias families from their homes"*. Valley Central. Retrieved August 21, 2015.
540. **Jump up^** *"CPF No. 4-2015-1009H" (PDF)*. Retrieved 28 November 2016.
541. **Jump up^** *"Fire on Williams pipeline"*. www.upstreamonline.com. Retrieved August 21, 2015.
542. **Jump up^** KPRC. *"All-clear given to Cypress residents evacuated after gas leak"*. Retrieved September 6, 2015.
543. **Jump up^** *"Two Injured in Louisiana Pipeline Fire"*. The Maritime Executive. Retrieved January 18, 2016.
544. **Jump up^** *"Gas leak forces Fairfax Co. business closures"*. WTOP. September 24, 2015. Retrieved January 18, 2016.
545. **Jump up^** *"Centreville Brief: Colonial Issues Cleanup Update"*. connectionnewspapers.com. Retrieved January 18, 2016.
546. **Jump up^** Clint Durrett (May 15, 2012). *"Police: 3 dead, 2 in serious condition after Gibson plant explosion"*. WDSU. Retrieved May 23, 2016.
547. **Jump up^** *"PHMSA: Stakeholder Communications – Operator Information"*. dot.gov. Retrieved May 23, 2016.
548. **Jump up^** *"CPF 4-2016-1008" (PDF)*. Retrieved 28 November 2016.
549. **Jump up^** Administration, Department of Transportation's Pipeline and Hazardous Materials Safety. *"PHMSA - Briefing Room"*.
550. **Jump up^** *"11,000 gallons of gasoline, butane and propane leak from pipeline in Summit County"*. DeseretNews.com. November 30, 2015. Retrieved May 23, 2016.
551. **Jump up^** Von Quednow, Cindy & Carlson, Cheri (December 9, 2015). *"Highway 118 commuters beware: Somis oil spill cleanup will take days"*. Ventura County Star.
552. **Jump up^** *"Preliminary investigation: ONG releases cause behind Oklahoma City house explosion"*. KFOR.com. Retrieved May 23, 2016.

IND 821-1 cont'd

553. **Jump up^** *"ONG agrees to pay $1 million in fines related to Oklahoma City home explosion"*. October 12, 2016.
554. **Jump up^** *"Gas line explosion in Robertson County"*. Kbtx.com. Retrieved January 18, 2016.
555. **Jump up^** *"Gas leak closes Highway 56 west of McPherson"*. KSN-TV. Retrieved May 23, 2016.
556. **Jump up^** Scott hansen News Record Writer shansen@gillettenewsrecord.net (February 16, 2016). *"Cause of oil leak determined to be internal corrosion of an old pipe"*. Gillette News Record. Retrieved May 23, 2016.
557. **Jump up^** *"Officials: 2 Hurt After Gas Plant Blast, Fire in South Texas"*. NBC 5 Dallas-Fort Worth. Retrieved May 23, 2016.
558. **Jump up^** Shireen Santhanasamy (February 24, 2016). *"Pipeline fire north of Sulphur"*. kplctv.com. Retrieved May 23, 2016.
559. **Jump up^** *"PHMSA: Stakeholder Communications - Operator Information"*. primis.phmsa.dot.gov. Retrieved October 5, 2016.
560. **Jump up^** Jessica Plue. *"UPDATE: The gas spill at Magellan Pipeline Company has been"*. SIOUXLANDMATTERS. Retrieved May 23, 2016.
561. **Jump up^** Al Aamodt. *"Pipeline leak being repaired near Harwood"*. valleynewslive.com. Retrieved May 23, 2016.
562. **Jump up^** *"TransCanada shuts down Keystone after oil seeps to surface"*. National Observer. Retrieved May 23, 2016.
563. **Jump up^** *"CPF No. 3-2016-5002H" (PDF)*. Retrieved 28 November 2016.
564. **Jump up^** TEGNA. *"Two Killed, One Injured in Gas Plant Explosion Near Woodsboro"*. kiiitv.com. Retrieved September 16, 2016.
565. **Jump up^** *"CPF No. 2-2016 5003H" (PDF)*. Retrieved 28 November 2016.
566. **Jump up^** Tribune-Review (April 29, 2016). *"Man burned in Salem Twp. gas line explosion; homes, businesses evacuated"*. TribLIVE.com. Retrieved May 23, 2016.
567. **Jump up^** *"Spectra Energy Corp. assessing natural gas transmission pipeline after explosion in April 2016, according to Pittsburgh Post-Gazette - Pittsburgh Business Times"*. bizjournals.com. Retrieved September 16, 2016.
568. **Jump up^** *"Corrosion discovered four years before Westmoreland County pipe blast"*. post-gazette.com. Retrieved September 16, 2016.
569. **Jump up^** *"Oil pipeline near Tracy spills thousands of gallons of crude"*. sfgate.com. Retrieved September 16, 2016.
570. **Jump up^** *"California Crimson Pipeline Oil Spill Stopped Before Reaching Pacific Ocean"*. weather.com. Retrieved September 16, 2016.
571. **Jump up^** *"More oil spilled in Ventura barranca than initially believed"*. vcstar.com. Retrieved September 16, 2016.
572. **Jump up^** *"Petroleum leak reported along Goochland-Henrico line"*. richmond.com. Retrieved September 16, 2016.
573. **Jump up^** Wray, Dianna (September 2, 2016). *"Sunoco, Sued After August Pipeline Fire, Has a History of Safety Violations"*. houstonpress.com. Retrieved September 16, 2016.
574. **Jump up^** *"Dredge hits coastal Jefferson Parish pipeline, Coast Guard reports"*. nola.com. Retrieved September 16, 2016.
575. **Jump up^** *"State of emergency declared after crucial oil pipeline leaks 250,000 gallons in Alabama"*. kofr.com. Retrieved September 16, 2016.
576. **Jump up^** Posey, Melanie. *"Colonial Pipeline: At least 42,000 gallons of gas leaked from line"*. wbrc.com. Retrieved September 16, 2016.
577. **Jump up^** *"U.S. regulator orders inquiry, repairs after Sunoco's Permian leak"*. September 15, 2016 – via Reuters.
578. **Jump up^** *"Two Nicor Gas Workers Injured, Townhouse Units Destroyed in Romeoville Explosion"*.
579. **Jump up^** writers, Andrew J. Nelson and Emily Nitcher / World-Herald staff. *"Some families being allowed into their homes; those nearest deadly chemical leak unable to return"*.
580. **Jump up^** *"Subcontractor takes responsibility for Portland gas line breach"*.
581. **Jump up^** Writer Staff, TOM KNAPP. *"55,000 gallons of gasoline spills into Susquehanna, effect on Lancaster County drinking water unclear"*.

IND 821-1 cont'd

582. **Jump up^** *"Seaway Pipeline crude oil leak reported in Cushing, Okla."*.
583. **Jump up^** *"Colonial may open key U.S. gasoline line by Saturday after fatal blast"*. November 2, 2016 – via Reuters.
584. **Jump up^** *"Helena – Colonial Pipeline Response"*.
585. **Jump up^** News, ABC. *"OSHA: 2nd Person Dies After Alabama Pipeline Explosion"*. ABC News.
586. **Jump up^** *"Pipeline explosion in Northland draws federal investigator"*. Kansas City.
587. **Jump up^** *"Leak causes approximately 2,000 barrels of source water to flow into Skull Creek in Bowman County"*. North Dakota Department of Health. December 2, 2016.
588. **Jump up^** *"Western North Dakota oil pipeline shut down after spill"*. Duluth Tribute.

INDIVIDUALS
IND822 – Kim Kirkbride

20161222-5176 FERC PDF (Unofficial) 12/21/2016 10:38:16 PM

Federal Energy Regulatory Commission
Kimberly D. Bose, Secretary
888 First St. N.E. Room 1A
Washington, DC 20426

RE: Docket #CP16-10-000 (Mountain Valley Pipeline)

Ms. Bose,

IND 822-1 I am writing to provide you with information on gross inadequacies within the Mountain Valley Pipeline (MVP) draft environmental impact statement. I live along the proposed pipeline route in Pembroke, Va in Giles County. I have lived in this area for ten years and never expected that an area I love so dearly would be threatened by a natural gas pipeline.

Lack of needs assessment

My objection to the pipeline and the inadequate DEIS begins with a lack of a needs assessment by FERC. The National Environmental Protection Act requires agencies to assess the need for a proposed project. Considering the significant environmental impacts of pipeline construction that FERC has listed in the DEIS, it is absolutely imperative to first answer whether there is a need for new infrastructure.

The Synapse report concludes that current natural gas infrastructure capacity will exceed even high end estimates of natural gas demands up to the year 2030. More explicitly, the report concludes that neither the MVP nor Atlantic Coast Pipeline is needed to meet the high end projections of natural gas demand in the next few decades. Renewable resources are quickly gaining in economic viability; even Dominion Power has admitted they can produce solar cheaper than they can produce natural gas.

IND 822-2 **Lack of consideration of cumulative impacts**

My second objection is on the grounds that FERC has failed to consider the cumulative environmental impacts of building new pipelines and locking in another generation of fossil fuel infrastructure. It was over ten years ago that policymakers and energy industry leaders were saying that natural gas would serve as a bridge fuel as we transition to an energy economy based on renewables. The past ten years have been that bridge, and now renewables are more economically viable than ever. We do not need to pin our future on natural gas when alternatives exist. FERC has failed to address the real viability of renewable alternatives and the cumulative effects of climate change. FERC and MVP have failed to address these critical issues because if climate change were a factor in approving this project, it could not comply. Citizens deserve a full accounting of all the effects of committing to decades more fossil fuel extraction. It is a required part of the NEPA process.

IND 822-3 **Cultural and Historical Impacts**

In my own county the proposed path of the MVP threatens multiple historic sites. I want to stress that threats to these historic sites are not mitigatable. Historic sites within the blast zone of the MVP will face irreparable harm. The proposed path goes right through historic Newport Village, with numerous historic buildings being within the "blast zone". Pipeline leaks and explosions are not uncommon. Natural gas pipelines can and do explode, pressure relief systems do fail and when they do, communities and ecosystems have to bear the burden. Mt. Olivet United Methodist church that has stood for 165 years cannot simply be replaced if incinerated. The Newport Recreation Center is a historic building that houses an arts-based afterschool childcare program, a nature-based preschool, a public library and

IND822-1 See the response to comment FA11-2 regarding need. Non-environmental FERC staff may address the Synapse report in the Project Order.

IND822-2 Cumulative impacts and climate change are addressed in sections 4.11 and 4.13 of the EIS.

IND822-3 Historic sites are evaluated in section 4.10 of the EIS. Impacts on historic properties can be mitigated, in accordance with the regulations for implementing Section 106 of the NHPA at 36 CFR 800. The Mount Olivet Methodist Church is 430 feet away from the pipeline and the Newport Recreation Center is 945 feet away; neither would be adversely affected by the MVP. See the response to comment IND2-1 regarding safety. See the response to comment IND92-1 regarding leaks.

IND 822-3 cont'd

Virginia's oldest agricultural fair. These programs are enriching our community and nurturing our next generation. If the MVP is built adjacent to this building no parent would send their child to a preschool or afterschool program there. These businesses would be forced to relocate, and there are not many options for that in Giles County. In essence you are asking us to trade in our community assets for threats to our water, forest and peace of mind. In Pembroke the proposed path of the MVP will go within yards of the first church and first schoolhouse building ever built in Little Stony Creek hollow. These buildings cannot be rebuilt if they are incinerated by a pipeline explosion. They cannot be replaced, and threatening them amounts to threatening our heritage.

IND 822-4

Karst and erosion control

I'm sure that I'm not the first person to mention the porous Karst geology and steep topography along the MVP route. It does not take a scientist (although many agree) to realize that the combination of mountainous karst terrain and a natural gas pipeline are a recipe for disaster. We have over 300 caves in Giles County, with water flowing unpredictably throughout them. It would be impossible for FERC and MVP to guarantee that the pipeline will not leak into the ground water. As I mentioned above, pipelines can and do leak (please see other submission regarding pipeline accidents in the 21st century). Most of Giles County residents are on well water, and many of those wells are shallow because of our high water table. The steep terrain and seismic activity of karst will put additional stress on the pipeline, increasing the possibility of leaks and cracks in the line. When, not if, the pipeline does leak, it will certainly contaminate the groundwater.

Furthermore, denuding the landscape to construct the pipeline will cause significant and unnecessary soil erosion that will threaten our streams and the New River. We have some of the best trout streams in the state thanks to our intact and healthy forest ecosystem. The disruption of pipeline construction is only the beginning of the sedimentation issue. This region is prone to landslides on denuded ground. The clear cut of the pipeline path will be prone to landslides over time, meaning our streams will continue to experience increased erosion and sedimentation. The less stable the ground is surrounding the pipeline, the more vulnerable the pipeline will be to shifts and cracks. No landscape deserves a pipeline, especially given all the other cumulative impacts, but Karst terrain alone is reason enough to not approve this pipeline project.

IND 822-5

Jefferson National Forest Management plan

I was appalled to see that the DEIS suggests that an existing forest management be weakened to accommodate pipeline construction. In this wet and steep ecology, the pipeline construction cannot occur without increasing stream sedimentation above levels set out in the current Jefferson National Forest Management plan. The Jefferson National Forest is a major tourism draw for Giles County. The Appalachian Trail, Cascades Recreation area and trout fishing in Big and Little Stony creeks attract people from all over. We have some of the healthiest forests in the state thanks to existing protections and it is inexcusable to weaken them to allow for this pipeline to be built.

The scenic integrity objective along the Appalachian National Scenic Trail should not be reduced to allow for pipeline construction. Thousands of through hikers pass along the ANST each year and many that I have met remark that Giles County is one of the most beautiful places along the AT. The MVP will cross the ANST at the Rice Fields, a high elevation meadow with nearly 360 degree views. It is one of the most beautiful campsites one can find; you can see the sun rise and set from one place. There are practically infinite special places like these in the Jefferson National Forest, and we should continue to protect them as the Forest Service has done so well for decades.

IND822-4 Steep slopes, landslides, and karst are addressed in section 4.1 of the EIS. See the response to comment IND3-1 regarding drinking water. See the response to comment IND70-1 regarding erosion.

IND822-5 See the response to comments FA8-1 and FA10-1 regarding the LRMP on the Jefferson National Forest. The ANST would be crossed by a bore. A revised visual analysis (including a leaf-off analysis) of the ANST can be found in section 4.8 of the final EIS. Tourism is addressed in section 4.9 of the EIS. See the response to comment FA8-1 regarding the 500-foot-wide utility corridor on the Jefferson National Forest.

IND 822-5 cont'd

Along these lines, I absolutely oppose the proposed change allowing a 500 foot corridor for future pipelines. Giles County is the fastest growing tourism economy in the state of Virginia and that is exclusively due to our abundant and pristine natural resources. The construction phase of the pipeline and the lasting threat of possible explosions will have direct negative impacts on our tourism economy. A 500ft wide utility corridor only increases the number of acres deforested, the number of pipelines that can leak into our water supply, and the amount of pesticides that will be sprayed each year to maintain the right of way.

Lastly, speaking purely for myself, although I know many others share this sentiment: The Jefferson National Forest is my home. It's my place of comfort and solace. It's my favorite place to spend time with friends and family, or simply to be alone. Some of the most important moments of my life have been spent in this forest. Please know how terrifying it is to think that my place of peace and joy for over ten years will be clear cut, bulldozed and left with the persistent threat of a leak or an explosion. I am not alone.

I urge the Forest Service to please continue to do their job as they have done well and not allow for exceptions to riparian and old growth protections to allow this pipeline. Please protect our natural resources from all threats, not consolidate this and future pipeline threats into one utility corridor. That would be taking one of the most beautiful landscapes in the state and turning it into a sacrifice zone. We have much better options.

IND 822-6

In closing

Lastly I want to say that I know that FERC is populated with engineers and regulatory gurus that will probably laugh at my arguments and think I know nothing and haven't read the DEIS thoroughly enough. That was my experience when I attempted to give my testimony in person in Roanoke, VA on November 3rd. I will ask this of you: please take note not only of the specifics in the public comments, but of their overall concern with this project. I know you have received thousands of public comments of concern regarding the MVP. The magnitude of that response counts for something on its own. I'm no fool to realize that industry engineers and regulators can twist the facts to their side. So at some point this just comes down to realizing what your decision means for thousands of people. We are being told, not even being asked, to share all of the risks of this project with no benefit. No one wants to lose their land to this project, whether by selling their easement or through imminent domain. No landowner or forest lover wants this project, because it is only threat and no benefit. Please think of the people that you're assigning this burden. What did they do to deserve this? Why does any community (human or forest) deserve to have their ways and means of life threatened for the sake of industry and corporate profits? We can't drink gas. Water is the most important thing on earth and this pipeline is a paramount threat to our water. This pipeline should not exist, not here or anywhere. We have better options available.

Kim Kirkbride
Pembroke, VA

IND822-6 The Commission would decide if the projects have public benefits and their opinions would be published in their Order.

Dear Federal Energy Regulatory Commission:

IND 823-1

Unfortunately, based on the DEIS, FERC appears to have ignored or disregarded the suggestion in my comment letter of July 4, 2016 (accession number 20160705-5054) that FERC scrutinize carefully the filings made by MVP before proceeding further with the certification process. As a result, the DEIS is a slanted, one-sided document biased in favor of the applicant MVP's proposed alignment. Below I identify numerous omissions, half-truths, inaccuracies and outright falsehoods in just those parts of the DEIS that pertain to the roughly four-mile span of the proposed alignment (approximately mileposts 213 through 217) in the vicinity of my farm. In these portions of the DEIS, FERC appears to systematically minimize legitimate environmental and life-safety concerns documented on the record by bona fide experts in the applicable scientific disciplines, and appears to be acting as an advocate for MVP's proposed alignment, which is unseemly, to say the least, given that MVP is one of FERC's regulated entities. Based on this material in the DEIS, it is reasonable to reckon, by extrapolation, that similar inaccuracies and omissions pepper the remainder of the document, sprinkled in at the same density as in the material respecting mileposts 213-217. Accordingly, FERC must either disapprove MVP's application altogether or issue a revised DEIS that, unlike the present iteration, avoids bias in favor of, and undue reliance on, MVP and thus affords the public a significant opportunity to weigh and comment upon an objective presentation of the evidence, and provides the basis for a meaningful comparison of alternatives.

Karst

IND 823-2

On p. ES-5 the DEIS states that "in part due to lack of access, [MVP] have not completed field surveys to identify water wells and springs within 150 feet of construction workspaces (500 feet in karst terrain)." To begin, it is alarming that FERC would consider issuing the DEIS prematurely, thereby approving MVP's proposed alignment, *before* the applicant completes field surveys. Secondly, this is one of dozens of instances throughout the DEIS where FERC appears to excuse MVP's failure to provide complete information on the basis that landowners are not allowing MVP access to their land. I, for one, have granted MVP access to my land on four separate occasions, on 4/6/16, 4/18/16, 4/25/16 and 6/24/16. Nonetheless, the most recent alignment, referenced in footnote 1 on p. 2-1 of the DEIS, still fails to identify all the Karst features on my land — even those features directly in the pipeline's path — features that were literally mapped out for FERC and MVP in my July comments. Thus, there may well be other reasons, in addition to the uncooperativeness of landowners, why MVP has not provided complete survey information with respect to the proposed alignment, especially in light of the fact that, based on its premature issuance of this DEIS, the FERC appears ready to approve MVP's proposed alignment so precipitously, without having all the applicable information at its disposal. As a responsible regulator FERC must explore what those other reasons might be, and must not allow MVP to proceed with the proposed alignment until all necessary information has been disclosed.

IND 823-3

Throughout the DEIS FERC consistently minimizes the extent of, and the hazards posed by, karst features along the proposed alignment. For example, the DEIS states on page 4-35 that "94 instances of karst features were identified" along the proposed alignment, but there are many more karst features along the proposed alignment that have *not* been identified, as is acknowledged elsewhere in the document.

As Dr. Kastning teaches in his most recent comments, with respect to Appendix L to the DEIS, purporting to list "Karst Features Identified Within 0.25 Mile of the Mountain Valley Project": "The paucity of detailed information in Appendix L is testimony that the karst inventory is insufficient for routing the

IND823-1 See the response to comment FA11-2 and LA5-1 regarding preparation of the EIS. We are not issuing another draft EIS, but this final EIS includes revisions and addresses comments on the draft.

IND823-2 See the response to comment LA15-14 regarding water wells.

IND823-3 Section 4.1 of the final EIS has been revised to provide additional details regarding karst features in the project area. See the response to comment IND62-1 regarding Dr. Kastning's report

IND 823-3

proposed pipeline corridor. The real density of karst features is undoubtedly considerably more than six per mile (as stated in the above introduction) and the average spacing would be much less than 900 feet if subtle karst features were included" (Accession number 20161212-5032, p.7). Indeed, Appendix L at p. L-17 does omit several sinkholes I literally had mapped out for FERC in connection with my comments submitted in July (accession number 20160705-5054). It also omits the swallet/sinkhole at milepost 216.3 characterized elsewhere in the DEIS as a wetland and as a fishery of special concern, as discussed below. Perhaps most shockingly, however, is the mischaracterization of the sinkholes at milepost 215.8: The indicated "Level of Concern" is "None," the "Description of the Feature" is "Sinkholes 150 to 400 feet left (northwest) of the proposed alignment," and the "Construction Recommendations" include the statement that "The proposed construction alignment, as mapped, does not appear to directly encounter the sinkholes." In fact the proposed alignment goes directly through at least two sinkholes and narrowly skirts others.

IND 823-4

The latest iteration of the proposed alignment in the vicinity of my farm is shown in the document entitled "Karst Review – FERC 4.0.0 Desktop & [yes, *still*] Incomplete Field," Sheet 25 of 37, dated 02-18-16, which represents various sinkholes mapped in previous alignments (see, e.g., Accession number 20151023 (30974910), p. 211 of 284), but magically shrunken. Note, however, the disclaimer corresponding to the shrunken sinkhole representations, in fine print to the left: "VGIN Contour Disclaimer: 'Any determination of topography or contours, or any depiction of physical improvements, property lines or boundaries is for general information only and shall not be used for the design, modification, or construction of improvements to real property or for flood plain determination'." This act of prestidigitation apparently is the basis for the above-quoted statement that the "alignment, as mapped, does not appear to directly encounter the sinkholes." Please see the comments of Dr. Hodges (Accession number 20151127-5175, and generally) for an informed discussion of the value of this new graphic representation of the sinkholes, as well as for the authoritative discussion of the dangers posed by weak soils in this location.

IND 823-5

Similarly misleading, at (printed) page 7 of 10, Table 2: Karst Features — Proposed MVP Filing Alignment (Accession number 20160226-5404 (31274316), p. 530 of 730) also omits the swallet/sinkhole at milepost 216.3. This table is not included in the DEIS or its appendices. It contains admissions absent elsewhere in the MVP filings as to the grave danger of disturbing the karst features located at mileposts 216.75 and 216.80, respectively. As to milepost 216.75 the listed "Concern" is that "[c]onstruction across or in [sic] near the vicinity of sinkhole may lead to long-term differential settlement and pipeline instability." With respect to milepost 216.80 the "Concern" is that "[t]he proposed alignment procedes up a ridge alongside the edge of the watershed for a stream that sinks into and open throat sinkhole at a potential cave entrance. This observation suggests the karst groundwater flow could be relatively near the ground surface in the immediate area." This is an especially grave threat, given the location of these features, where the pipeline suddenly turns right to scale the steep slope of Sinking Creek Mountain. In neither case is the corresponding "Recommendation[]" actually responsive to the indicated concern. How could it be, when obviously the only responsible way to proceed is not to build at these locations?

IND 823-6

Also on page 4-35 the DEIS cites historic PHMSA incident data for Virginia and West Virginia "in order to characterize the potential for karst (ground subsidence) to affect the MVP." Fifty-three such incidents are reported as having occurred from 1970 to 1984. However, incidents of subsidence appear to have been reported less frequently for subsequent periods. The DEIS is quick to point out that for the earlier period (1970 to 1984) there is no data as to whether or not the 53 incidents were due to karst. However,

IND823-4 Mountain Valley adopted some slight modifications into its proposed route in an October 2016 filing, that are addressed in the final EIS.

IND823-5 Table 2 was used to prepare appendix L in the EIS. Table 2 was last revised on October 14, 2016.

IND823-6 Section 4.12 indicates that incidents involving FERC-regulated interstate natural gas pipelines are rare. Section 4.1 points out that existing pipelines have been safely installed across karst.

IND 823-6 cont'd

the DEIS is silent as to whether, and the extent to which: (1) the apparently reduced frequency of reports of subsidence may be due to how such incidents were tagged or categorized when input into the respective datasets being built at the applicable times, or (2) the categories used by FERC it its attempt to retrieve these figures from the database in fact produced a complete listing of such incidents that were actually reported. On the other hand, the DEIS does point out that in the most recent period (2010 to present) "only one record was identified ... not due to heavy rains/floods." Of course it is quite possible that other incidents of ground failure, which *were* categorized as due to heavy rains/floods during this period, were actually the result of the operation of the storm water on underlying karst features.

IND 823-7

DEIS p. 4-78: "Trench spoils would be used to backfill the trench, and the ground surface would be re-contoured to pre-construction conditions." This is precisely the instrumentality that causes suffusion/piping as described by Dr. Kastning in his "An Expert Report on Geologic Hazards in the Karst Regions of Virginia and West Virginia" (Accession number 20160713-5029), hereinafter the "Kastning report. In the section on Suffusion (Piping) beginning at p. 28 of the Kastning report, Kastning explains how the fill around the buried pipeline will, owing to the lower porosity of the fill material than that of the surrounding undisturbed trench floor and wall, act as conduit for groundwater flows, especially in areas where the buried pipeline traverses steep slopes. These "**enhanced groundwater flows**," according to Dr. Kastning have the "**potential to increase rates of underground dissolution at subsurface locations receiving those flows. Underground rock dissolution caused by surface water infiltration is usually undetected until the final roof of an enlarging cavity falls in; such processes could easily and suddenly impact the integrity of the pipe**" (Kastning report, p. 29).

IND 823-8

In the discussion under the heading "Karst Terrain" at p. 4-78 of the DEIS, FERC acknowledges that there is "significant karst development present from MPs 190 to 237." The DEIS assures us, however, that MVP would "implement its Karst Mitigation Plan and deploy a karst specialist to assist in limiting potential negative impacts on karst features" during construction. However, when after a day of searching for it I was finally able to locate the Karst Mitigation Plan among the numerous hodgepodge MVP filings (the Karst Mitigation Plan, oddly, is not included as such in the DEIS), I discovered that it is essentially devoid of much real substance; similarly, it is unclear what the function of the "karst specialist," alternatingly referred to elsewhere in the DEIS as the "karst team," would actually be, during construction, other than to be present and "inspect." The DEIS at p. 4-78 states that "[t]he karst specialist would inspect karst features to identify potential connectivity to the subterranean environment, assess risk for impacting groundwater quality and recharge to the karst aquifer" (tasks which should, in my view, have been completed before the issuance of the DEIS or, at any rate, before MVP is allowed to proceed), "as well as provide recommendations for karst feature stabilization and mitigation," functions which should only be necessary in the case of karst features along the proposed alignment that could not have been discovered prior to the beginning of construction.

IND 823-9

As suggested elsewhere in this document, the Karst Mitigation Plan (Accession number 20151023-5035 (30974910), pp. 282 of 284).) is insubstantial. Essentially there are two levels of inspection; if after a second-level inspection it appears that the karst feature has "connectivity to the subterranean environment and potential to impact groundwater, the KS [Karst Specialist] will consult with MVP Construction regarding appropriate mitigation," which would be conducted according to recommendations from VDCR, and alert Mr. Orndorff of that agency (Ibid. at 279 of 284). The reader is assured that "[t]he final MVP alignment for construction will have accommodated for karst feature

IND823-7 See the response to comment IND62-1 regarding Dr. Kastning's report.

IND823-8 We stand by our findings that Mountain Valley has developed plans that would mitigate construction through karst.

IND823-9 See the response to comment CO59-1 regarding Canoe Cave. The October 2016 proposed route would avoid the Canoe Cave Conservation Site.

IND 823-9 cont'd

avoidance recommendations. Therefore, a karst feature located within the LOD is likely to be minor" (Ibid. at 276 of 284). (This is interesting in light of the fact that Mr. Orndorff himself has, as discussed below, recommended in the strongest possible terms that the Canoe Cave Conservation Site be avoided; does this mean that MVP will actually follow this recommendation?) "Avoidance of a karst feature," we are assured, "constitutes the first and foremost recommendation for mitigating impact" (Ibid. at 269 of 284).

IND 823-10

At p. 4-43 of the DEIS, FERC omits mention of Craig County, in the sentence immediately preceding Table 4.3.1-2, even though the table in fact discloses the existence of a swallet at milepost 216.8 in Craig County.

IND 823-11

Table 4.3.1-2 itself also fails to disclose the existence of the swallet or sinkhole at milepost 216.3, which elsewhere in the DEIS is characterized as a "wetland" (Appendix G-1, p. G1-31), and a "fishery of special concern" (Appendix F-5, p. F5-5), crossed by MVP. At certain seasons of the year, however, the sinkhole at milepost 216.3 appears to be by definition a swallet, since at those times it takes the entire insurgence of the associated spring-fed stream. The proposed alignment runs directly through this swallet/sinkhole, yet this particular apparent karst feature, known to MVP, is systematically omitted from lists of karst features throughout the DEIS. This repeated omission is especially troubling, as the mischaracterization of a karst feature as something other than a karst feature may call into question the integrity of the DEIS itself with respect to its presentation of karst hazards, and certainly the MVP filings relied on to produce it.

Compounded Potential Hazards

IND 823-12

DEIS p. 4-49: "Mountain Valley's Karst Mitigation Plan also provides measures for mitigation of minor karst features such as sinkholes. Mitigation of sinkholes would involve reverse gradient backfilling of the sinkhole to stabilize the sinkhole from collapse. If a larger karst feature or cave is identified during construction the karst inspector would coordinate with the appropriate state agencies regarding mitigation and/or avoidance of the discovered feature. Mountain Valley modeled the pipeline's ability to span a sinkhole. According to Mountain Valley, a pipe with a wall thickness of 0.7 inch (the minimum that would be used in a karst area), could span a sinkhole from 57 feet, with 10 feet of cover, to 145 feet with 3 feet of cover."

Modeling the pipeline's ability to span sinkholes is certainly appropriate here, but the mathematical modeling techniques used by MVP's consultant to perform this task do not replicate the actual conditions under which the pipe will be used. The modeling referred to assumes linear spans of pipe of the specified lengths, when the reality is that the pipeline will twist and turn quite frequently as it follows MVP's proposed circuitous alignment over the Valley and Ridge Province. What happens when ground failure(s) occur(s) at or near (an) elbow joint(s)? Further, individual sections of pipe will be bent by a pipe-bending machine to conform to the contours of the ground, as described on p. 2-40 of the DEIS, which is not accounted for in the mathematical modeling presented by MVP. Will a bent section of pipe perform according to the model for linear pipe? Certainly bending will alter the thickness of the wall of the pipe at certain locations along the bend. Moreover, MVP's modeling assumes — unrealistically, given the high density of sinkholes along certain sections of the alignment, exemplified by the area around milepost 215.8 — that a length of pipe will need to span just one sinkhole, when multiple sinkholes may be present along the given length of pipe. How much ground must *not* subside between two sinkholes along a certain span in order for the pipe not to fail? Among three sinkholes?

IND823-10 The commentor's statement is unclear as page 4-43 is the geology section and table 4.3.1-2 is included in the water resources section.

IND823-11 Table 4.3.1-2 of the EIS lists drinking water sources, such as springs, swallets, and water wells. Wetlands are provided in appendix G.

IND823-12 Bending would not alter the thickness of the pipe. The gentle bending is not expected to interfere with the modeling results.

IND 823-12 cont'd

The sinkholes in the area around milepost 215.8, for instance, are much more closely spaced than 57 feet. Finally, to what extent would the sheer weight of a buried 42 inch diameter steel pipe with minimum .7 inch walls, filled with high-pressure natural gas, itself *cause* ground subsidence in fragile karst terrain already prone to subsidence? All these questions must be answered authoritatively, by means of modeling *and* field testing, before FERC can responsibly allow the project to proceed.

IND 823-13

At pp. 4-50 – 4-51 the DEIS explains that blasting may be necessary in areas of shallow bedrock. The existence of shallow bedrock in the vicinity of my farm, at milepost 216.8-217.2, is disclosed in Appendix M at p. M-5. The DEIS is silent about the extent to which blasting will further weaken underlying karst structures and actually promote further ground failure. However, the reader is assured that MVP "would not conduct blasting in karst areas without a karst specialist." The DEIS is silent as to how, exactly, the presence during blasting of a karst specialist, no matter how highly qualified, will avoid or mitigate damage to underlying and nearby karst features from blasting. But we are told that MVP has "developed" a draft Blasting Plan. Frankly, I am unaware of any reason to assume that the draft Blasting Plan developed by MVP is any more substantive a document than the Karst Mitigation Plan, discussed above. While the DEIS does not say that that such Blasting Plan has been filed with FERC, the DEIS does provide a list of bulleted items that are outlined in the plan. Only one of the bulleted items ("limit the charge size and stagger charge detonations") appears to have any bearing on preventing or mitigating damage to underlying karst structures from blasting; the remaining items appear to involve life safety and monitoring for, and mitigating, after the fact the damage that has been caused by the blasting. At any rate, there is nothing karst-specific about this particular phrase, since it applies generally to all construction-related blasting. It may, however, tend to promote a false sense of security as to the safety or wisdom of blasting in karst terrain in the first place.

IND 823-14

Similarly conclusory, and empty, statements about blasting appear in the often referred to Karst Mitigation Plan: "Blasting will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of known or inferred subsurface karst structures.... Blasting will be conducted by a qualified blasting contractor, in accordance with the contractors [sic] written and approved blasting plan" (Accession number 20151023-5035 (30974910), p. 282 of 284). Again, there simply is nothing here that will actually mitigate damage to karst from blasting. Nor could there be.

IND 823-15

On p. 4-52 of the DEIS: "The GCSZ is a seismically active area known for small local seismic events and one historic quake that took place in 1897 before modern seismic monitoring equipment but was estimated to be magnitude 5.8 (Bollinger et al., 1988)." The area around mileposts 213-217 lies squarely within the Giles County Seismic Zone (the GCSZ) (See Figure 6-A: Seismic Zones in Virginia and West Virginia at p. B-11 of the Kastning report.)

"There is potential for an earthquake to occur during the decades of operation and maintenance of the MVP. As stated in section 4.1.2.4, the MVP would be able to withstand probable seismic events that may be encountered in the project area. Specifically the MVP would be designed according to 49 CFR 192 Subpart C, ASME B31.8-2014 Paragraph 840, and PRCI – Guidelines for the Seismic Design and Assessment of Natural Gas and Liquid Hydrocarbon Pipelines which includes procedures and guidelines for quantifying seismic hazards, pipeline performance criteria, pipeline analysis procedures, and potential mitigation options with regards [sic] to pipeline design." These regulations and guidelines, however, do not address earthquake hazard in conjunction with steep slopes in Karst topography prone to ground subsidence and landslides. It therefore does not follow from the above that the MVP would

IND823-13 See the response to comment CO14-1 regarding blasting. The location of the *General Blasting Plan* can be found in table 2.4-2.

IND823-14 See the response to comment CO14-1 regarding blasting.

IND823-15 Seismicity and earthquakes are addressed in section 4.1 of the EIS. As stated in section 4.1 of the EIS, earthquake shaking alone does not pose a significant threat to the integrity of modern buried welded steel pipelines.

IND 823-15 cont'd

be able to withstand probable seismic events. The pronouncement that MVP would be able to withstand probable seismic events is based on the unrealistic assumption that the pipeline would likely not be subject to other, compounded stresses in the event of a quake: As Mountain Valley points out, "[i]t is generally recognized that earthquake ground shaking alone does not pose a significant threat to the integrity of modern buried welded steel high-pressure pipelines" (Accession number 20160408-5318 (31374518), p. 97 of 666). Such a statement might be of some use where the pipeline company has not deliberately chosen to construct the pipeline in areas where other, extraordinary risks are always present, such as risk of landslide, ground failure, etc. This, however, in not the case with the MVP, where a host of factors will necessarily increase or exacerbate damage to the pipeline caused by ground shaking in an earthquake.

IND 823-16

At p. 5-1 the DEIS states that "[a]bout 67 percent of the MVP would cross areas susceptible to landslides." Before allowing the project to proceed, FERC, as a responsible regulatory agency, must assess the likelihood that, and the extent to which, landslides could: (1) damage the pipeline, (2) be caused by the construction and/or operation of the pipeline and (3) be caused by blasting or even minor earthquakes.

The risk of landslide is generally highest in areas of steep slopes. Some of the steepest slopes along the proposed alignment occur, in karst terrain, among very densely spaced, apparently unavoidable, known and documented karst features, some of which are associated with groundwater, at mileposts 213.7, 214.2, 214.8-214.9, 215.5, 216.2, 216.7-216.8 and 217 (Appendix K, pp. K-29–K-30). It is difficult to understand how a responsible regulatory agency could permit construction of a natural gas pipeline to proceed in an area that thus represents "the perfect storm" of compounded potential hazards.

Endangered Species

IND 823-17

DEIS p. 4-158: "The MVP pipeline route would cross the Canoe Cave Conservation Site in the vicinity of MP 213.7 in Giles County, Virginia. The site is ranked by VDCR as B2, having second order significance for natural resources. However, there are no records of federal or state-listed species associated with the site. Canoe Cave also has a high potential for use as a bat hibernacula. VDCR staff inventoried Canoe Cave in November 2015 and observed two tri-colored bats." It is an outright falsehood to say that there are no federal or state-listed species associated with the site, because according to MVPs own filings there is indeed a reliable record of an observation of the animal now classified as the Northern long-eared bat, a federal endangered species, in Canoe Cave (Accession number 20160718-5161 (31585150), pp. 62 of 304: Attachment DR3 Wildlife-5a-2). Similarly, while the DEIS seemingly attempts to downplay the importance of VDCR staff observing "two tricolored bats" in Canoe Cave just last year, the tri-colored bat is in fact a state-listed species (Accession number 20160718-5161 (31585150), 61 of 304).

Nesting habitat and foraging habitat for the Loggerhead Shrike, another endangered species, are also present at mileposts 215.66, 215.82, 215.94, 216.14, 216.27, 216.46 and 216.6 (Accession number 20160718-5161 (31585150), p. 301-302 of 304: Attachment DR3 Wildlife-8.

This area may also be habitat for the Northeastern bulrush, yet another federal endangered species (Accession number 20161027-5212, p. 54 of 113).

IND823-16 Landslides are addressed in section 4.1 of the EIS. Mountain Valley would adhere to the landslide mitigation techniques as outlined in the *Landslide Mitigation Plan*.

IND823-17 See the response to comment CO59-1 regarding Canoe Cave. The October 2016 proposed route would avoid the Canoe Cave Conservation Site. Threatened and endangered species are addressed in section 4.7 of the EIS.

Alternatives/Variations/Adjustments to the Proposed Alignment

IND 823-18

DEIS p. 4-35: "The current proposed alignment for the MVP pipeline would cross subterranean portions of Canoe Cave. Inspections by Mountain Valley's Karst Team suggest that the cave is located close to the ground surface. Historical mapping of Canoe Cave indicated underground stream flow coming from the upland mountain ridge to the northeast. Construction across Canoe Cave could result in damage to natural resources, differential settlement, and pipeline instability. Due to potential underground stream flow, the potential to inadvertently discharge to groundwater exists. Mountain Valley is continuing to evaluate route adjustments that would avoid Canoe Cave."

In fact, roots observed in the cave suggest that "the cave comes very close to the surface directly beneath the pipeline route." The cave contains three deep lakes and its actual size is unknown at this time; scuba divers will need to explore how much more dry cave area may extend beyond the lakes (Accession number 20160718-5161 (31585150), p. 54 of 304: Attachment DR3 Wildlife-5a-2). Accordingly, MVP may not be able to determine whether or not any contemplated adjustments to the proposed alignment will actually move the pipeline out of the cave's footprint. Wil Orndorff, VDCR's Karst Protection Coordinator (Accession number 20160718-5161 (31585150), p. 63 of 304) is of opinion is that "[t]o the maximum extent possible, avoidance of the Canoe Conservation site is recommended. Construction within the cave footprint is strongly discouraged" (Ibid. at p. 65 of 304).

IND 823-19

As previously noted, and demonstrated in this document, the DEIS does not provide complete or suitable information that could serve as a meaningful basis of comparison of alternative rountings. Furthermore, the presentation and discussion of alternatives in the DEIS is cursory and simplistic at best. One of the reasons this is true is that MVP's filings themselves don't provide the relevant information, even when complete, all in one location so that readers can actually make comparisons in the first place. For instance, Attachment DR3 Alternatives-2 (Accession number 20160718-5161 (31585152), p. 501 of 503) provides only five areas of comparison. To facilitate meaningful comparison of alternatives, if the project is to be allowed to proceed, a revised draft DEIS must be issued which contains a similar table listing all the alternatives, but also listing all the features discussed in this document (e.g., nature of and proximity to karst features encountered, seismicity, hydrology, likelihood blasting will be necessary, likelihood of landslide, steepness of slopes, endangered species potentially affected, Natural Heritage Resource Cave Conservation Sites crossed, etc.). All other pertinent areas of comparison must also be disclosed, in the same place, including, for instance, (1) number and nature of Ecological Core Areas (ECAs) crossed (Alternate Route 200 necessitates the crossing of a large core and a medium core ECA[i] that are avoided by other alternatives (Accession number 20161027-5212, p. 34 of 113)), and (2) the possibility of shared use of existing utility easements (Alternate Route 1 is presented as crossing a prohibitive expanse of old growth forest but, as other commenters have pointed out, MVP could follow the course of an existing utility easement for much if not all of that distance).

Necessary Conditions to Proceeding with the Project

IND 823-20

FERC's Recommendation 15 states that "Prior to the end of the draft EIS comment period, Mountain Valley shall file with the Secretary the results of on-site surveys for the Mount Tabor Route Alternative to assess constructability and identify karst features that shall be avoided if the alternative is adopted into the proposed pipeline route" (DEIS, p. 5-20). In like manner, FERC should now require that MVP, before a revised DEIS is issued, (1) develop a route alternative to the proposed alignment between mileposts 213 and 217, and (2) file on-site surveys for both the proposed alignment between mileposts

IND823-18 See the response to comment CO59-1 regarding Canoe Cave. The October 2016 proposed route would avoid Canoe Cave by over 900 feet.

IND823-19 All alternatives of substance raised by stakeholders have been provided in the EIS for comparison.

IND823-20 See the response to comment CO6-1 regarding the Mount Tabor Variation.

IND 823-20 cont'd

213 and 217 and the alternate route to assess constructability and identify karst features that shall be avoided, whether or not the alternative is adopted.

IND 823-21

At p. 4-255 the DEIS states that MVP "is continuing to evaluate options for Canoe Cave." However, there is just one permissible option for Canoe Cave: FERC should impose as a condition to MVP's proceeding with the project a requirement that proposed alignment be rerouted to avoid the Canoe Cave Conservation Site.

IND 823-22

FERC's Recommendation 39 states that "Prior to construction, Mountain Valley and Equitrans shall file with the Secretary the location of all water wells, springs, swallets, and other drinking water sources within 150 feet (500 feet in karst terrain) of the pipeline and aboveground facilities" (DEIS, p. 5-23). This recommendation must be modified to require that this filing be made before the close of the new comment period for the revised DEIS, so that FERC can ensure that contamination of groundwater used for drinking water can be avoided, and not just mitigated. This is especially true in the vicinity of my farm, given the difficulty of finding a good well in the area.

Conclusion

IND 823-23

The misleading and incomplete analysis in the DEIS demonstrates reckless lack of concern for the welfare of the community by MVP and FERC. Obviously the application must be denied or, failing that, a new, revised DEIS must be issued. As currently proposed the pipeline will ruin our valley and impose unreasonable hardships on property owners and their neighbors, for the sole purpose of generating corporate profit.

I am an octogenarian and a veteran. I have a right to expect better from my government than this apparent papering over of MVP's attempted land grab. If the irresponsible decision to route the MVP over my property and neighboring properties is, as it appears from the DEIS to be, a foregone conclusion, I deserve to be told as much, by the FERC, without equivocation. In October and November I received voicemail messages from MVP's Rick Elmore expressing the desire to obtain from me an easement across my farm for the construction of the pipeline, despite the fact that I have previously made perfectly clear to him and, on record, to MVP and FERC the fact that I am unwilling to convey any interest in my property to MVP. Mr. Elmore apparently believes that FERC will indeed rubber-stamp MVP's application, as he indicated in October that MVP wished to obtain the easement "before condemnation proceedings" begin and in November that MVP wished to complete the agreement before "construction started." I will not be railroaded. I have faith that FERC will act responsibly, irrespective of the current iteration of the DEIS.

[i] In Figure 4.4.1-3 at DEIS p. 4-135 these are referred to as a "Very High" and an "Outstanding" ECA, respectively.

IND823-21 See the response to comment CO59-1 regarding Canoe Cave. The October 2016 proposed route would avoid Canoe Cave.

IND823-22 See the response to comment IND401-5 regarding pending information about water wells.

IND823-23 See the response to comment FA11-2 and LA5-1 regarding preparation of the EIS.

INDIVIDUALS

IND824 – Paige Holt

4815 Nature's Waye Rd
Blacksburg, VA 24060
December 21, 2016

Kimberly D. Bose
Secretary, Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

Reference:
OEP/DG2E/Gas 3
Mountain Valley Pipeline LLC
Docket No. CP16-10-000
Equitrans LP
Docket No. CP16-13-000

Dear Ms. Bose:

IND 824-1

I am writing to ask that you require significant revisions to the draft Environmental Impact Statement (EIS) which has been prepared for the Mountain Valley Pipeline and Equitrans Expansion Project. As you are aware, the NEPA requires all potential impacts of the activity to be considered. However, there are significant impacts that have not been considered as part of the document. I am requesting that these issues be addressed as part of a rewritten draft EIS and that an additional public comment period be provided to allow the public to evaluate the accuracy of the complete determination.

1. Air emissions have not been adequately quantified. While there are general statements that the NAAQS will not be exceeded, there is no data provided to support that assertion. For the public to have adequate review opportunity, calculations such as those must be available for scrutiny. In fact, the report does not even list the specific criteria or noncriteria pollutants that were considered. Furthermore, methane is a significant contributor to greenhouse gases and those emissions are not even mentioned.

   According to the EPA and state regulations, a stationary source is all the pollutant-emitting activities which (1) belong to the same industrial grouping, (2) are located on one or more contiguous or adjacent properties, and (3) are under common control. This entire project is completely on contiguous property under the common control. Therefore, the emissions from this entire project should be considered together to evaluate impacts on the surrounding communities and ecosystems. NEPA does not distinguish between temporary and permanent emissions or between fugitive and point source emissions. Therefore, all of those emission types must be considered, provided in the EIS, and available for review to the public before the environmental impact can be accurately assessed in preparation for a final decision.

   Specifically, fugitive emissions during construction are mentioned. I presume this would include particulate emissions from stone crushing, soil movement, welding, diesel equipment, and vehicular traffic traveling to/from the construction site. None of these are specifically mentioned, nor is the possibility of burning wood debris as approximately 81% of the pipeline would be constructed through forested land. This would require a substantial amount of clearing and elimination of a tremendous amount of wood debris. However, there is no detail provided to determine which, if any, of these types of emissions were actually considered or what the corresponding emissions level would be. Burning wood debris is, at a minimum, a significant

IND824-1

See the response to comment FA11-2 and LA5-1 regarding preparation of the EIS. This final EIS includes revisions and addresses comments on the draft.

The draft EIS read (page4-413): "It is expected that compliance with the applicable federal and state air quality standards and regulations would be addressed accordingly in the air quality permits. As a result, we conclude that air quality impacts during operation of the compressor stations would be minor." The EIS further explains that an air quality screening analysis (i.e., dispersion modeling) was performed for each of the compressor stations and results for all pollutants were in compliance with the relevant National Ambient Air Quality Standard (NAAQS). A copy of the dispersion modeling can be found as appendices to Resource Report 9 submitted with Mountain Valley's application.

During processing of the EIS, the Applicant's emissions calculations were reviewed for completeness and accuracy. The results are presented as tables in the EIS. The calculation worksheets can be found as appendices to Response Report 9.

For operational emissions, the EIS includes greenhouse gas (GHG) and hazardous air pollutant (HAP) emissions in the emissions tables (i.e., non-criteria pollutants). GHG emissions are comprised mainly of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O); the values are presented in the form of CO_2-equivalents. HAPs are presented as a cumulative total – and the emissions from the highest individual HAP (formaldehyde) is provided in the table note. For construction emissions, the Applicant used EPA's Nonroad2008a model to calculate emissions for nonroad engines; the model includes hydrocarbons (HC), carbon monoxide (CO), oxides of nitrogen (NOx), particulate matter (PM), CO_2, and sulfur dioxide (SO_2). HAP emissions were quantified as a portion of the HC emissions. The Applicant used EPA's Mobile6.2 model to calculate emissions for on-road vehicles; the model includes HC, CO, NOx, PM, CO_2, SO_2 and some HAPs. The models do not quantify other components of GHGs beyond CO_2 since the amounts are generally very minimal. For fugitive emissions, the applicant used EPA's AP-42 emission factors. All results are presented as tables in the EIS – HAP emissions from construction were not provided in the tables and have been added as a table note in the final EIS. If the calculation worksheets are requested for viewing, they can be found as appendices to Resource Report 9.

INDIVIDUALS
IND824 – Paige Holt

IND824-1

As discussed in the EIS, the Applicants submitted source aggregation analyses to the respective state agencies. The determination was that, except for Harris Station, each of the compressor stations and respective contiguous or adjacent facilities did not meet the definition of a single stationary source.

All emissions results are presented as tables in the EIS – which tabulates emissions from fugitive dust and open burning. The calculation worksheets (appendices to Response Report 9), indicate that fugitive dust was calculated for travel on paved roads, travel on unpaved roads, and earthmoving (includes bulldozing and grading). Open burning includes fugitives from burning of brush and slash from clearing.

IND 824-1 cont'd

activity that was not even mentioned in the EIS. And it can have substantial health effects such as heart attacks and lung issues if conducted close to residences which contain elderly, asthmatics, children, or particularly susceptible individuals. Beyond the health concerns, it is prudent practice to use a variety of control techniques to minimize emissions from the construction activities including water suppression, low sulfur diesel fuel, and mitigation techniques for transportation of workers. Since the air emissions were not quantified, none of these appear to have been considered either.

The concept that there are significant emissions from any pipeline carrying chemicals is well established. Many of EPAs New Source Performance Standards and Maximum Achievable Control Technology regulations require Leak Detection and Repair (LDAR) practices to be implemented. These regulations include estimates to quantify typical leak rates but they also require that owners of chemical piping and transport equipment like pumps and valves measure the leak rate from that equipment. This action proposes to install approximately 309 miles of new pipeline and never even quantifies or mentions the amount of natural gas that will be lost through exactly the same type of piping that is used in chemical plants, except that the ones in chemical plants are more accessible and more likely that a leak would be noticed. At a minimum, LDAR practices should be required for this project as well.

Standard sources generalize that approximately 3% of the total gas sent into the transport/distribution system is "lost"[i], indicating that approximately 0.03 x 0.4 billion ft^3/ day of natural gas emissions can be anticipated as a direct result of this pipeline construction. That equates to approximately 4.4 BILLION cubic feet per year of gas emitted. This does not include emissions from the processing plant. However, EPA air regulations routinely require that any emissions calculation for a project include any additional emissions that stem from debottlenecking an upstream or downstream process. In this case, the pipeline will provide additional means to sell the gas product and therefore the emissions from the overall processing and transportation of the gas should be quantified and are an important factor that have been completely left out of this EIS.

Assuming that the gas volume quoted of 0.4 Bcf/day is measured at 15 oC and atmospheric pressure, emissions can also be calculated using emission factors from a study which refined methodology from the *IPCC Guidelines for National Greenhouse Gas Inventories*. Emission factors from this document estimate that methane will be released at the rate of approximately 3.7 x 10^{-3} Gg per km[ii]. This would equate to approximately four million pounds of methane released per year, or 2026 tons/ yr. In CO_2 equivalents, this project would be directly responsible for the equivalent of 42,600 tons per year.

The omission of these impacts, as well as more potent pollutants (like formaldehyde) which are released in smaller quantities from the combustion process at pressure stations, from the EIS preparation indicate that environmental impacts have not adequately been considered and a final decision should not be made without additional review by the public of the potential impacts.

As a mitigation measure and to ensure that emissions are not excessive, chemical plants are required to monitor the emissions from pipelines on a quarterly basis, especially at flanges pumps, and valves. At a minimum, Mountain Valley pipeline owners should be required to meet this same standard for the entire time the pipeline is in service to prevent excess emissions of methane going undetected and to protect the citizens that live, play or work close to the pipeline.

IND 824-2

2. There are several elements within the EIS that refer to additional evaluation being needed, including the endangered species discussion, the North Fork Historic District, and the incomplete

IND824-2 Section 4.7 of the final EIS has been revised to provide updated consultations with the FWS. See the response to comment FA11-18 regarding pending cultural resource surveys. The North Fork Rural Historic District is discussed in section 4.10.

IND 824-2 cont'd

NHPA process. No decision should be finalized without the additional data and mitigation plans that are inferred but not defined or included for review. It is inappropriate to claim that such impacts have been considered if they have not even yet been defined.

IND 824-3

3. While karst topography was considered, no references or evidence of the anticipated impact of running this pipeline through karst was included. Sudden shifts and sinkholes frequently occur in karst topography and should be more thoroughly evaluated or the karst should be avoided altogether.

IND 824-4

For these reasons, I respectfully request that the EIS be resubmitted to include the missing elements and reasonable mitigation measures. For air pollution mitigation measures in particular, there are a variety of sources on minimizing emissions from natural gas processing and transmission, including quarterly LDAR inspections and required corrections. Those should be utilized to the maximum extent AND a reasonable effort must be made to provide an honest assessment of the impacts of air pollution emissions that will result from this project, including those associated with the processing plant debottlenecking.

Sincerely,

Paige W. Holt, PhD, PE

Endnotes

[i] "How much Natural Gas Leaks?", S.P. Ogburn, *Scientific American*, August 1, 2013, https://scientificamerican.com/article/how-much-natural-gas-leaks, page 3.

[ii] "Fugitive emissions from Oil and Natural Gas Activities", David Picard, *Good Practice Guidance and Uncertainty Measurement in National Greenhouse Gas Inventories,* p. 113

IND824-3 Karst and sinkholes are addressed in section 4.1 of the EIS. See the response to comment LA1-4 regarding existing 42-inch-diameter natural gas pipelines in karst terrain.

IND824-4 We did not produce a supplemental draft EIS. We produced a final EIS that addresses new information and comments on the draft.

Caroline Terlecki, Fort Washington, MD.

IND 825-1 Please do not allow this to happen. The Appalachian Trail is a national treasure to millions of Americans. Imagine running a pipeline through the Lincoln Memorial or the Washington Monument. The nature of the devastation that this would cause would be detrimental to the nation as a whole.

As an artist in the DC Metro area, I look to the memories of the views that I have seen to draw inspiration for my work. Walking the weathered trails and hiking to the tops of mountains, sleeping in the lean-to huts, and the flora and fauna of the mostly undisturbed environment is an experience that shouldn't be marred by construction and pipelines. Just 150 miles from Standing Rock, ND, a pipeline ruptured in the last month that's causing mass destruction to the environment. The streams and valleys of the Appalachian Trail would be permanently destroyed if that happened.

There are not words to describe the devastation that this pipeline would cause.

Please, from one citizen of the world to another, do not allow this to happen.

IND825-1 The ANST would be crossed by a bore. A revised visual analysis of the ANST can be found in section 4.8 of the final EIS. The proposed pipelines would transport vaporized natural gas, not oil. See the response to comment IND92-1 regarding leaks.

To: Kimberly D. Bose, Secretary; Federal Energy Regulatory Commission
Norman Bay, Chairman, Members of the Commission

From: Thomas Bouldin, Pence Springs, West Virginia

Date: December 22, 2016

Re: Intervenor Comment on the Draft Environmental Impact Statement
Docket No. CP16-10-000, Mountain Valley Pipeline

Environmental Justice and the Claims of Summers County, WV

IND 826-1 This comment challenges the DEIS account of the Mountain Valley Pipeline's impacts related to the issue of Environmental Justice and calls into question the routing of the Mountain Valley Pipeline through Summers County, West Virginia. There are good reasons to believe that the route clearly violates principles of environmental justice which have been articulated in numerous legal contexts for use in regulatory decision-making. Section 309 of the Clean Air Act empowers the EPA to pursue principles of Environmental Justice, and the Agency's guidance requires that "All EISs filed with the EPA should be reviewed for adequate environmental justice content."[1]

IND 826-2 The concern for environmental justice is simply one aspect of a broader concern for effects of public policy in degrading the "human environment" which Section 1508.4 of the National Environmental Policy Act defines "comprehensively to include the natural and physical environment and the relationship of people with that environment." The definition concludes by saying that "When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated then the EIS will discuss all of these effects on the human environment."

Further, the NEPA website discussion of NEPA and Environmental Justice states that a Clinton-era executive order "makes it the responsibility of each Federal Agency to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health and environmental impacts of its programs, policies, and activities on minority populations and low-income populations." While FERC itself has been historically somewhat averse to considering issues of environmental justice, the Department of Energy, with which FERC is allied, repeats the NEPA language, acknowledging that NEPA is "implemented in connection with agency projects," including environmental

[1] Jason Pinney, "The FERC and Environmental Justice: Do the NEPA and CAA Offer a Better Way?" http://bc.edu/dam/files/schools/law/lawreviews/j

IND826-1 We stand by our analysis of environmental justice in section 4.9 of the final EIS.

IND826-2 See section 4.9.8.1 for a description of the criteria used to assessment impacts on low income and minority populations.

IND 826-2 cont'd

justice issues addressed by determining if there are any such "disproportionately high" impacts on the populations identified. [2]

I will assume that environmental concerns for minority and low-income populations arise from the acknowledgement that low-income populations—at least in rural areas--are more directly dependent upon their relation to the natural and physical environments for food, fuel, shelter and supplemental income, and that they therefore are more vulnerable to the effects of negative impacts on that environment. And I am willing to argue that this is the case, even if such an understanding did not inform the Federal commitment to environmental justice.

IND 826-3

The DEIS as it currently stands does not provide the necessary data for assessing the issue of environmental justice in any meaningful way as the concept might relate to the proposed Mountain Valley Pipeline project. First of all, the materials prepared by FERC staff do not document the necessary economic data to display the purposes of the proposal that led to the selection of the route through Summers County. Nor does the DEIS contain the necessary data

IND 826-4

to identify the physical impacts of construction on affected landowners, much less predict the economic-value costs extracted by those impacts. Finally, the DEIS lacks the data needed to

IND 826-5

determine whether or not the vulnerable populations along the preferred route are in fact being asked to shoulder a *disproportionate* burden of the negative effects of the project.

Therefore, the conclusion of this comment is that the **DEIS treatment of socioeconomic aspects of the MVP proposal must be entirely reconceived and re-written before any final closing of the period for public comment on the draft Environmental Impact Statement.** The alternative course of action is for FERC to issue a decision of No Action, which would be justified on any number of counts, including the project's potential adverse effects on vulnerable populations.

1. CRITICAL DATA MISSING FROM THE DEIS

IND 826-6

I have noted in an earlier comment that the DEIS discussion of the socioeconomic environment for the MVP is inadequate in many ways. To a large degree, these deficiencies all serve to undermine any accurate analysis of the social costs of the project to the affected populations, whether these be the general public, the landowners and communities that will be asked to host the pipeline's presence and operation, or the unidentified and still un-numbered members of the public who will be asked to provide the commodity payments that generate the

[2] U.S. Department of Energy website, *Environmental Justice, 5-Year Implementation Plan, 3rd and 4th Year Progress Reports*. It is unfortunately typical that these various statements of principle do not define the key term 'disproportionately high' which triggers a judgment of injustice. One wonders if a 'proportionately high' incidence of suffering can be made acceptable. Equally disturbing is the Department of Energy statement that" Environmental Justice is addressed by determining If there are any" such impacts. The statement does not say that Justice requires any further action.

IND826-3

Section 4.9.2.8 of the final EIS states: "The MVP is designed to transport natural gas from the production fields of northern West Virginia to the Transco interconnect in central Virginia. Along the way, Mountain Valley selected its pipeline route to take advantage of ridgetop alignments, cross as little federal lands as possible, avoid major waterbodies and wetlands where possible, and avoid major population centers. The pipeline route mostly crosses rural regions with relatively low population densities. By avoiding metropolitan areas, the MVP should reduce impacts on communities with high percentages of minorities, low-income populations, and other vulnerable populations."

IND826-4

Impacts on landowners are discussed in section 4.9.

IND826-5

Section 4.9.2.8 of the EIS states: "Based on our review, we determined that low-income populations exist in the MVP and EEP areas; however, impacts from the projects would not disproportionately fall on environmental justice populations. Further, impacts on these populations would not appreciably exceed impacts on the general population."

IND826-6

We assume that the commentor's statement regarding "commodity payments" is in reference to current and potential future gas prices as a result of the projects. The price of natural gas is dependent on many factors and prediction of future prices is neither feasible nor within the scope of this EIS.

IND 826-6 cont'd | corporate profits guaranteed by FERC. Without such data, it is impossible to describe the proportion of the project's costs that fall on county residents along the route.

IND 826-7 | The DEIS misrepresents the for-profit dimensions of the project, excluding any discussion of the socioeconomic motives for the proposal[3]: the purpose of the project is described simply as providing shipping to unspecified markets in the mid-Atlantic, southeastern and Appalachian regions of high-quality, low-cost, clean natural gas. The DEIS also excludes any explanation of why the Transco pooling station 165 was selected as the only possible terminus for the MVP.[4]

IND 826-8

IND 826-9 | The proposing corporations and the FERC have systematically avoided public statements detailing the *expected profits* the pipeline will convey. For instance, in their examination of the negative effects of a No Action Decision from FERC, the company does not even mention the lost profits involved, or the capital already expended in preparing the application which would be lost if the proposal is rejected.[5] Similarly, there is no discussion of the high rate of return FERC has traditionally allowed for investments for infrastructure, a policy that some believe has led to serious over-building of pipelines.[6] Nor is there any discussion of the benefits of the proposed pipeline to stockholders in the various corporations sponsoring the application. (The centrality of that profit as a motivator can be seen if one imagines the corporate response should FERC allow construction—but limit the 'rate of return' to nothing more than what the EQT/MVP, NextEra and partners put into the construction in the first place.) The absence of this financial data makes it impossible to compare the impact on affected landowners to the benefits conferred on other participants.

IND 826-10 | Moreover, neither the MVP nor the DEIS acknowledge the *value of the gas transported*, a value to the general public that cannot be replaced once the resource is consumed.[7] Logically, this value must be considerably in excess of whatever EQT and the other partners are willing to pay

[3] See Docket CP16-10, Document #20161220-5050.

[4] As I have stated elsewhere, the Pittsylvania terminus for the MVP may not really be necessary. The possibly arbitrary choice of this end-point is important, for, if the line could as easily be routed around Summers County, to insist on the present route is more difficult to defend. The same applies to various environmental risks to the pipeline's integrity from karst and seismically active terrain: if avoidance is possible, why take the additional risks? Cost is likely to be the only answer. But again, the DEIS provides us no analytic details on this economic factor.

[5] I dealt with this failed argument in detail in Docket CP16-10, document# 20160201—5202.

[6] See the study submitted to FERC by Appalachian Mountain Advocates, http://www.appalmad.org/2016/04/27/study-mvp-and-acp-show-overbuilding-by-natural-gas-industry/ ; predictably industry voices take a different tact on this issue, but confirm the 14% figure, see "INGAA to FERC: Include MLPS in Equity Return Formula," http://www.ogi.com/articles/print/volume-104/issue-33/general-int

[7] I addressed this question in a comment to Docket PF15-3-000, Document #20150427—5109; the value of the gas to the public and future generations is far beyond the current market value, and much greater than all the short-term benefits which could be attributed to the MVP.

IND826-7 Non-environmental staff would assess rates for the projects. One of the original purposes of the NGA was to limit the profits of regulated natural gas companies.

IND826-8 Section 1 of the final EIS indicated that the terminus for the MVP pipeline at Transco Station 165 is the existing pooling point for Zone 5 on Transco's system and a gas trading hub for the Mid-Atlantic market, which is where the shippers want to receive gas.

IND826-9 An analysis of potential profits of the project are not within the scope of the EIS. Additionally, this information is not necessary to assess the potential effect of the project on landowners.

IND826-10 The current and future value of gas is not within the scope of this EIS.

IND 826-10 cont'd

for a fuel they intend to produce, transport, and sell at profit in the projected markets. And **the loss of this value once the gas has been used up is most obviously a *local or regional* loss, of natural wealth that might have benefitted local populations—and the nation as a whole—for generations into the future.** Yet, at present, MVP has identified only *two regionally local customers* for the gas along their transport lines: a small distribution company in the Roanoke area of Virginia[8], and Columbia Gas, a gas company in West Virginia which plans to transport the contracted fuel eastward toward the coast, rather than distributing it to its West Virginia customers. Other cooperating distributors are assumed to serve generalized markets throughout the target area (essentially the entire East Coast between New York and the Gulf Coast states), picking up the gas through the Transco terminus in Virginia.

The significance of this lack of regional benefit from the project was brought home by a recent ruling of the West Virginia Supreme Court. MVP had argued that state law gave them the right to survey for the pipeline even against landowners' wishes and without landowner consent. The Supreme Court, however, sided with a Monroe County judge who ruled that state law requires that a pipeline company requesting survey rights must demonstrate that the public has the benefit of use of the gas transported.[9] Such a public use clause is fairly characteristic of most applications of the principle of *eminent domain,* and it is one way the law protects against abuses of local citizens by large-scale interests, a goal quite similar to concerns for environmental justice.

IND 826-11

Yet another serious shortcoming in the DEIS is the exclusion of any attempt to evaluate the economic aspects of environmental degradation necessitated by the pipeline's construction. Even when acknowledging significant and long-term damages to area forests, the DEIS refuses to estimate any economic loss. In most cases, the FERC staff have carefully refused to offer measures of negative impacts, so that estimating their economic value is neither 'necessary' nor possible. Given the lack of data in the DEIS, one is forced to turn to the Key-Log Economics study for such data, which estimates costs of the MVP to affected counties at somewhere between 8.0 and 8.9 billion dollars in present value terms.[10]

[8] Earlier reports have suggested that Roanoke Gas does not, in fact, really need MVP as a supplier (The Roanoke Times, February 17, 2016: "Franklin County and Pipeline Opponents Reach Agreement on Information Request") since "there's a natural gas tap in Clearbrooke that could be extended to the county."

[9] See http://www.Roanaoke.com/business/west-virginia-supreme-court-sides-with-landowners in pipeline...

[10] Time permitting, I will submit to Docket CP16-10 a discussion of the issues raised in the DEIS re: the Key-Log Economics studies. In the meantime, see Key-Log Economics' response to DEIS' criticisms in Docket CP16-10, Document #20161220--5186.

IND826-11 We disagree with the commentor's statement that the EIS does not evaluate the economic impacts of the project. Economic impacts are addressed section 4.9. See the response to comment letter CO100 regarding the Key-Log Economics Study.

IND 826-12

Although the DEIS has obscured the relevant data, it seems not inaccurate to state that **the Mountain Valley Pipeline is a plan that removes natural wealth from the state of West Virginia, transports that wealth across substantial portions of the state and through a section of Virginia** that shares much in common culturally with Appalachian West Virginia—**and provides whatever benefits derive from this new supply of gas to areas (for the most part) outside the section of the country that will bear the negative impacts of the transmission pipeline.** Moreover, **one of the populations involved in the plan also bears the considerable negative impacts of production of the gas** by a method not universally utilized throughout the target-market area, since fracking is considered by some to entail negative effects on health and the environment that exceed the value of increased energy production.[11] Examples include the state of New York, which will **buy the gas but bans the practice**, and the state of Virginia, which welcomes the supposed **economic benefits stimulated by a supply of 'fracked' gas, but is inclined to discourage the use of the method** in the state's own environment.[12]

Thus it seems accurate to say that to a very large degree **the positive effects of the project extend to one population, while the negative impacts—resulting from manipulations of "the natural, physical, social and economic elements of the human environment"—are largely reserved for another group.** And as we shall see, at least one subset of the 'victimized' group is small in number, yet distinguished by relative poverty, high rates of disability, and advanced age—suggesting that the pipeline's negative effect may indeed be 'disproportionate'.

2. DEIS: DEMOGRAPHICS SELECTIVELY DISPLAYED

2.1 Poverty, Disabilities, an Aging Population, and Home-ownership in Summers County

IND 826-13

Summers County West Virginia is rich in natural beauty—with three mainstem rivers (two officially identified as National treasures), two major state parks, broad woodlands and sheltered valleys, extensive farm and pasture acreage. Yet it is an area that by most conventional standards is 'below average' in wealth and development. Even in the largely rural state of West Virginia, Summers County stands out in some significant ways. The county covers approximately 368 square miles in area, accommodating a population (in 2010) of 13,927. This yields a population density of only *36 persons per square mile*, with an *average of 20 occupied home-sites per square mile* (although these average figures are misleading since much of the county's acreage is, in fact, not built on at all).

[11] I have dealt elsewhere with the logical and practical fallacies of FERC's insistence on treating the MVP pipeline solely in terms of transportation issues. I address these issues in a comment on the MVP and the Public Interest, section 4.1., which I hope to submit by the close of the comment period.

[12] A valuable discussion of the decision to ban fracking can be found referenced in my comment just referred to, drawing on *a Washington Post* blog article, December 21, 2014, by Chris Mooney, "These two states had the same information about fracking. They made very different decisions."

IND826-12

As part of the Commission's determination whether to grant or deny the Applicants' request for Certificate authorization is a consideration of the benefits of the projects in comparison to any adverse impacts. See the Commission's "Certificate Policy Statement" (*Certification of New Interstate Natural Gas Pipeline Facilities*, 88 FERC ¶ 61,227 (1999), clarified in 90 FERC ¶ 61,128, and further clarified in 92 ¶ 61,094 (2000)).

IND826-13

Impacts on water resources, including wells, are discussed in section 4.3, forest fragmentation is discuss in section 4.4, and soil compaction is discussed in section 4.2.2.1.

IND 826-13 cont'd

The relatively dispersed population pattern has significant implications for certain **social impacts** of the MVP proposal (construction activities or accidents during operation could increase social isolation as well as affecting access to emergency services, shopping markets, and other necessities). Other aspects of a predominantly rural culture—including the prevalence of private wells, home gardens and wood lots for the provision of necessities—increase the potential severity of **environmental impacts**, especially various aspects of groundwater hydrology necessary for sustaining household and agricultural water supplies, the clear-cut easement's disruption and fragmentation of woodlands in the county, and increased threats of sedimentation, and the disruption and subsequent compaction of soils in the construction easement, workspaces, access roads and the ROW trench.

IND 826-14

But these observations about the county's population are too specific and concrete for the purposes of the DEIS, which provides no direct discussion of such specifics in relation to Summers County or any other site along the route. In the DEIS, any knowledge of the affected stakeholders is confined to abstracted demographic patterns like the following:[13]

Persons 65 years and older

Summers County	West Virginia	United States
20.5 percent	17.3 percent	14.1 percent

Persons with a disability, under age 65 years, percent (2009-2013)

Summers County	West Virginia	United States
21.7 percent	14.2 percent	8.4 percent

Percent of total population in poverty, 2013

Summers County	West Virginia	United States
22.6 percent	18.4 percent	14.5 percent

Percent of children in poverty, 2013

Summers County	West Virginia	United States
35.4 percent	26.3 percent	19.9 percent

[13] These figures were compiled from U.S. Census data issued September 2014; and USDA, ERS data last updated February 2015. I borrow this statistical material from a comment submitted Docket PF15-3—000, document #20150615-5111, which also includes commentary on why such figures as those on homeownership in a rural context present especially significant problems for regulatory decision-making. The materials in the DEIS pages confirm these claims, but omit any mention of home ownership—a significant omission.

IND826-14 Section 4.9 discusses environmental justice communities in the project area. Our analysis is in keeping with CEQ guidelines. The projects would not result in significant impacts to human health for populations that contain disproportionate percentages of minorities, poor, elderly, children, handicapped, or non-English speakers.

IND 826-14 cont'd

Per capita income in past 12 months (in 2013 dollars), 2009-2013

Summers County	West Virginia	United States
$17,416	$22,966	$28,155

Median household income (in 2013 dollars), 2009-2013

Summers County	West Virginia	United States
$33,784	$41,043	$53,046

Owner occupied housing unit rate, 2009-2013

Summers County	West Virginia	United States
79.6 percent	73.4 percent	64.9 percent

A quick glance at these figures suggests that the corporate sponsors of the MVP project appear to be either ignorant of—or capitalizing on—the vulnerability of a very susceptible group of citizens: a group including substantially higher-than-average numbers **of families and children living in relative poverty** (at rates considerably above national and state averages); above average rates of **citizens with disabilities** (at 21.7 % of the population, a rate almost 21/2 times the national average); and of **older citizens** (at 20.5% a rate more than 45% higher than the national average). A further examination of census data reveals that more than a third (34.7 %) of the households in Summers County include at least one individual 65 years of age or older, that 14.3% of the households are occupied by a person over 65 living alone (4.4% by a single male, 9.9% by a single female).

Any reasonable person looking at this data might question the humane wisdom of the present routing of the line. And any reasoned examination of these figures in light of lived human realities suggests immediately that the population of Summers County includes a very large number of people at unusual risk from the disruptions and dangers of pipeline construction. A third of households, for instance, include the elderly—who are more likely to be vulnerable to the stresses and pollution involved, and another 14% house seniors living alone. The county also includes a large group of people who would be at even greater risk throughout the years of the pipeline's operation should there be any major leak or rupture (with more than one in five citizens under the age of 65 already dealing with a disability).

IND 826-15

While we cannot know the route-planning procedures used by MVP,[14] and we cannot know the managerial motives that settled on a route through Summers County, we can know some things about Summers County that make it an effective emblem for the exercise of Environmental Justice. It is not just the high concentration of relatively impoverished citizens, or of children living in poverty, of people with disabilities, or the elderly. **The most telling of the figures in this list for 2013 reveals that an astounding number of these relatively poor people are living in their own homes**: ***79.6% of Summers County residences are owner-occupied*—almost 15% more than the national average. It is worth pointing out further that *69% of these homes are***

[14] I addressed this issue in a comment on the socioeconomic implications of the route-planning procedure, CP16-10, Accession #20161221-5063.

IND826-15 The potential economic impacts of the project on landowners, such as loss of crops, property values, and timber production are discussed in section 4.9. Compensation for an easement would be negotiated between the landowner and the Applicant. Impact discussions on all individual parcels is not discussed in the EIS; as this is a summary document. The projects do not involve fracking.

IND 826-15 cont'd

not subject to a mortgage.[15] Sadly, I have heard it suggested unofficially that because they do not owe mortgages, a high number of residents also do not carry homeowners and liability insurance, which—if true—leaves relatively impoverished homeowners incredibly vulnerable in case of construction damages or accidents.

The high rate of home ownership is crucial to understanding why Environmental Justice is so relevant a concept for Summers County—and also why the DEIS is utterly inadequate to exploring the issue. While residents may lack much in the way of discretionary income, they do own their homes—and they will suffer considerably if there is damage during construction or operation of the pipeline. While the DEIS reassures us that MVP *might* willingly compensate an owner for damage, the corporation has already shown an inclination to turn to the courts for any relief they deem even vaguely possible: would MVP require a court case before compensating a poor family for losses? (MVP filed suit against more than 100 state residents in an attempt to force permission to survey[16]; EQT has filed suit against Fayette County, West Virginia for advancing an ordinance that would prevent the disposal of fracking waste in the county.[17]) These families mostly draw on local water resources (either their own or from the Public Service District downstream of the Greenbrier crossing) which can be severely impacted by construction of the line, or by leaks of gas or fluid condensates during operation. As with damages from construction, MVP has made some *carefully hedged commitments* on base-line testing and protecting water supplies,[18] but the corporate record is not altogether reassuring.

And not only are these homes and families vulnerable to damages from a pipeline that provides them few advantages, but these homes are in many cases very real working homesteads, not the 'bedroom' communities of suburban America. In many cases these homes have been in the same families for multiple generations, as some family graveyards will attest. These homes serve as the site for family reunions that help maintain familial continuities and social relationships that are of crucial importance to individual identity and can provide practical support through hard times. Families grow vegetable gardens; they grow hay if they have livestock, cut firewood for winter heat, run larger numbers of cattle or goats or poultry for food at home and for sale in local markets. These owner-occupied rural homes are not just places to live—they are, in many cases, a very important *means of living*.
And yet the DEIS contains no analysis whatsoever of the economic functions and value of these homes—or of the economic costs which can be assumed to be entailed by the pipeline's

[15] According to the website for the Summers County Planning Commission Comprehensive Plan: http://summerscompplan.blogspot.com/

[16] "Mountain Valley Pipeline Sues 103 WV Landowners for Survey Access"—April 7, 2015, Marcellus Drilling News: http://marcellusdrilling.com/2015/04/mountain-valley-pipeline-sues-103

[17] "EQT fights waste disposal ban in WV," February 2, 2016, Powersource.post-gazette.com: http://powersource.post-gazette.com/powersource/companies/2016

[18] Among the 'hedges' mentioned are regulations promulgated by some Federal agencies which limit water-resource liabilities to within 150' proximity of a well, and various other bureaucratic conveniences that may not play out to a landowner's advantage in the real world. Other hedges have to do with having to demonstrate that the company or its subcontractors are at fault—which could require hiring a hydrologist to analyze the terrain and an attorney to handle the case.

IND 826-15 cont'd

construction. The DEIS tell us the comparative economic status of a county's overall population—the average per capita income, the average household income—but reveals nothing about the social realities of the county's people, nothing about:

* **the size and value of specific land parcels affected** –or the relative extent of damage suffered by the landowner in granting an easement (the construction easement impacts one acre of land for every 348.5 feet it crosses: on a five-acre plot, this could mean a considerable loss).

* **the particular economic impacts faced by affected landowners**: How many of affected families depend on their gardens for a substantial portion of their food? How many depend on a well for their water? How many get fuel from a woodlot that the pipeline will damage or render inaccessible?

* **the effects on agricultural productivity of a pipeline's construction**—the DEIS implies that FERC can calculate this impact on the basis of previous projects, but they provide no such estimates for the parcels affected by MVP.

IND 826-16

Finally, for many of these residents—for something close to 80% of the people in Summers County?—the home may well represent the **family's most valuable financial asset**, against which one could borrow in case of a health crisis or other emergency—provided that a pipeline's presence doesn't foreclose on the possibility of getting a bank loan. The DEIS suggests that it is most unlikely for the project to have negative impacts on property values, banks loans and the like. However, their confidence is based on studies some of which have been criticized for methodological flaws, and others as being insufficiently relevant to actual conditions and constraints affecting the MVP.[19] Summers County real estate is more adequately assessed, and experienced, as a rural haven, after all, not a thriving urban-industrial metropolis: the two life-worlds hold rather different charms and attractions for potential buyers.

If one goal of environmental justice is to protect minority populations, those with low-incomes or who are disabled or elderly from "high and adverse effects" of a project, MVP's potential for destruction of Summers County natural resources certainly qualifies as a concern. **This is most**

[19] For the most current statement of the shortcomings of the studies relied upon by MVP/DEIS see Key-Log Economics' response previously referenced in Docket CP16-10, Document #20161221--5068. Concerns for the impact of pipelines on real estate values can be found in many submissions to Docket PF15-3-00, including documents #20150819—5044 and #20150819--5045 which question the applicability of earlier studies, and #20150713-5170, #20150713—5170, # 20150803—0052, and #20150727—5028 which questions both the logic and the justification for particular features of industry and Commission claims as applied to rural properties. Similar objections have been raised concerning a study reported by MVP in March 2016, which was conducted by the gas industry and involved almost exclusively urban or suburban homes, not rural properties in agricultural and retirement markets, and both its methodology and its relevance are questionable. (See Key-Log Economics, LLC,:Review of INGAA Foundation Report 'Pipeline Impacts to Property Values and Property Insurability.'")

IND826-16 Mountain Valley would not be purchasing homes in Summers County; merely negotiating for an easement across land. See the response to comment IND12-1 regarding property values.

IND 826-16 cont'd

certainly an instance in which "economic or social and natural or physical environmental effects are interrelated," requiring that the FERC's EIS must "discuss all of these effects on the human environment." Such an examination will surely reveal any "high and adverse human health and environmental impacts" of the proposal on a population that clearly is more vulnerable to those impacts than the typical American community.

In revising the DEIS, then, the first requirement is that FERC provide **detailed descriptive data of what is at stake for county residents.** Generally speaking, we know the poverty, age and disability are all potential descriptors of vulnerable populations which may occasion concerns for environmental justice. But **to estimate the significance of MVP's physical presence in the county, we have to have a concrete knowledge of that population's relation to the environment—as well as a detailed sense of the measured impacts the MVP will entail. From this data we can deduce whether or not there are significant impacts on the identified population**. *Yet even more information will be needed to determine whether these effects are in any sense disproportionate.*

2.2 MVP's Analysis of Environmental Justice Issues—and FERC's Support

IND 826-17

As is typical of much of the writing in MVP's Resource Reports, the treatment of the issue of environmental justice involves the presentation of a great deal of data, about which the writers avoid making many strong interpretive statements. Thus, for instance the discussion in Resource Report 5. Socioeconomics admits that both the **poverty rates** (RR5. Socioeconomics, page 5—38) and also the **percentage of elderly** in Summers County (RR5. Socioeconomics, Page 5—38) exceed national and/or state averages. Nonetheless, having established that potentially disadvantaged populations exist in the project area, MVP denies—without proof—that the project will have any disproportionate effects on these populations. The writers state that "...construction of the Project is not expected to result in adverse and disproportionate human health or environmental effects to these communities, as discussed below. As a result, no environmental justice-related mitigation is proposed." (RR5. Socio-economics, pg. 5—39)

But MVP's demonstration of non-impact is unconvincing because it is almost completely lacking in concrete evidence. For instance, the writers state:

> *"Construction of the Project is not expected to have high and adverse human health or environmental effects on any nearby communities. Adverse construction-related impacts would likely include increases in local traffic and noise, as well as dust, and could result in temporary delays at some highway crossings. These impacts would be temporary and localized and are not expected to be high. Construction workers temporarily relocating to the Project area would increase demand for local housing resources." (RR5. Socio-economics, pg. 5—39)*

IND826-17 Section 4.9 presents our assessment of impacts on environmental justice populations. Impacts on groundwater is discussed in section 4.3; agricultural soils in sections 2, 4.2, and 4.8.

IND 826-17 cont'd

No serious impact on the environment is even mentioned here—just temporary increases in noise and dust, and a temporarily-increased demand for local housing. **In re-reading MVP's assertions, I am reminded of NEPA §1508.27 (b), where point 7 reads, in part, "Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts." Aside from the strange leap from noise and dust to construction workers renting local housing, notice that the passage neatly side-steps all the *environmental damages* that could result from "construction-related impacts."** There are no concerns for possible pollution of groundwater and agricultural soils through spills of lubricants and fuel, or for possible destruction of hydrological structures that provide water to wells and springs, or for increased sedimentation from construction on steep slopes. None of these perfectly realistic and possible construction-related impacts' is mentioned—nor is the heightened vulnerability of many of the identified citizen groups to noise, dust, and (in cases of emergency) 'minor' traffic delays.'

The remainder of MVP's discussion does not further the argument by providing detailed evidence. Possible negatives are briefly acknowledged in almost the same general terms already quoted—and then dismissed:

> *"Construction could also increase demand for health care and municipal services, as well as potentially increase demand for police and fire protection services. However, these impacts are expected to be temporary and are not expected to measurably affect the quality of services currently received by local communities and residents." (RR5. Socioeconomics, pg. 5—39)*

> *"Operation of the Project is not expected to have high and adverse human health or environmental effects on any nearby communities, or result in adverse and disproportionate human health or environmental effects to minority or low income communities." (RR5. Socioeconomics, pg 5—39)*

The fact that MVP writers do not 'expect' problems is supposed to be enough to compel our belief that there will be no problems. But part of the reason they don't expect problems is that they refuse to look realistically at the world the MVP will be acting upon.

Unfortunately, the DEIS proceeds to state the same ideas, making the worst arguments even more explicit. **Although there is good reason to question the claims in the DEIS that all environmental impacts are temporary and insignificant, that claim provides the basis for this passage:**

> *"As discussed in section 4.9.1.8 above, there are communities that contain vulnerable populations located along the route of the proposed MVP. However, as discussed throughout this EIS, construction and operation of the MVP would not significantly affect the environment….we have determined that water and air quality would not be significantly impacted and that safety risks would be minimal. Therefore, these populations would not in turn be significantly affected." (DEIS, pg. 4—321)*

IND 826-17 cont'd

Then, apparently forgetting that there are no significant impacts, the DEIS shortly thereafter states:

> *"Based on our review, we determined that low-income populations exist in the MVP and EEP areas; however,* ***impacts from the projects would not disproportionately fall on environmental justice populations.*** *Further, impacts on these populations would not appreciably exceed impacts on the general population." DEIS, Pg. 4—321)*

To use a comment common enough in the DEIS, 'Unfortunately, the writers provide no facts or data to support these claims.' There is not one paragraph, one table, one figure in the section of the DEIS addressing socioeconomics illustrating *any* measured "impacts" that here the writers admit will befall "environmental justice populations'" in the MVP area—and similarly there is no indication at all of those measured "impacts on the general population." The writers have provided no evidence for either of the central claims of this paragraph—no proof whatsoever.

IND 826-18

And yet the DEIS discussion concludes thus: "There is no evidence that the projects would cause significant adverse health or environmental harm to any community with a disproportionate number of minorities, low-income, or other vulnerable populations." (page 4—321.) **IF this claim is true, the research agenda of the FERC staff appears to be largely to blame.** MVP stated that they did not *expect* significant impacts, and as a result, *t*here has been no interest in describing the aged population along the route in terms of the numbers of those ill with asthma, or those with serious heart disease, or breathing disorders—people especially vulnerable to the stresses and physical conditions of the construction process. There have been no attempts to establish how many people along the route may be dependent on threatened water resources vulnerable to construction damage. There have been no studies of how many of the low-income families affected will lose food production or access to winter fuel as a result of the pipeline installation. **FERC is right that "there is no evidence" presented in the DEIS—but primarily because FERC has not looked for any.**

The DEIS might well contain appropriate data had FERC's research agenda included the following issues:

(1) What are the "high and adverse human health and/or environmental effects" commonly associated with pipeline installation construction in geographic circumstances similar to those faced by the MVP? (I mean such things as pollution or destruction of private wells, springs, and other water resources; the collapse of slopes during construction or operation of the pipeline route which result in destruction of property and transportation lines; the fugitive releases of gas and of liquid condensates into the local environment, leading to health issues for affected landowners. And I mean such things as the increased potential for leaks, line ruptures, and lethal explosions which will certainly be "high and adverse" increases in potential danger when the affected area is compared either to its situation prior to installation or when compared to areas not equipped with their own version of the MVP; and also I mean the effects on health and happiness of living with the constant knowledge of such potentially negative experiences.)

IND826-18 Assessing the current mental and physical health of all landowners crossed by the project is outside the scope of the EIS. Impacts to private wells, springs, and water resources are discussed in section 4.3, steep slopes are discussed in section 4.1, and impacts to air are discussed in section 4.11. An assessment of these impacts on identified environmental justice communities is provided in section 4.9.2.8.

IND 826-18 cont'd

(2) What are the predictable possibilities that any of these "high and adverse human health or environmental effects on any nearby communities" might occur in Summers County if the MVP is built? Are there some members of the population more vulnerable to these effects than others? And,

(3) What are the comparable probabilities of occurrence in the neighborhoods of those 'other' populations affected by the project—that is, those beneficiary populations that will not have to suffer the installation of the pipeline (e.g., the Applicant's managers, stockholders, and other beneficiaries in the general public.) After all, it is only through a comparison to the 'given' circumstance that we can establish whether the effect on Summers County is, in the language of the NEPA statute, "**disproportionately high**."

To repudiate claims that the project represents an Environmental Injustice perpetrated by wealthy corporations against a population of relatively disadvantaged citizens, the DEIS and MVP's other publicists will need to explore those three issues in some substantial detail. They have not provided such analyses to date—perhaps because they cannot analyze data they have not collected. Perhaps because they would not like the answer. But it is not enough to say that they "'do not expect high and adverse effects" or that such effects "are not anticipated." The issue is not whether MVP or FERC expects them, but whether such effects might be predictable accompaniments of the MVP project.

3. Issues FERC Must Now Address

IND 826-19

Clearly the first order of business for those charged with revising the discussion of Environmental Justice is to collect the necessary data. This includes **descriptive** data on affected populations along the route, and **comparative data** for all those affected by the project as whole.

Descriptions of Those Impacted by the Route: What is needed beyond a data dump of conventional demographics is a more concrete description of the relation of affected persons to the affected environment. There are both general/abstract dimensions of this data (patterns of home ownership, property size and value, percentage of property de-valued in construction, etc.), and also more specific/concrete details (estimated degree of dependence on owned or local resources for food, fuel, and supplemental income; specifics of property landscape affecting degree of damage posed by construction). A complete list of these categories of data would probably require extensive survey/interview research to establish an appropriate range of issues.

Descriptions of Those Impacted by the Project: If we hope to understand the degree to which the local impacts of the project are 'disproportionate,' we must have the details about those other populations that are affected by the project. Comparative statistics describing local populations relative to the nation as a whole provide some of this data. However, knowledge of more clearly defined sub-populations is required for an appropriate estimate: as noted,

IND826-19 An assessment of each individual parcel crossed by the project is outside the scope of the EIS; which is a summary document. The Commission would decide about public benefits from then projects in their Order.

IND 826-19 cont'd

information on **impacts for beneficiaries** of the project (managers, stockholders, etc.), and also on the ultimate end-users of the energy.

On the basis of such information, FERC can then provide us with the necessary comparisons to illuminate the following sorts of issues:

(1) **Affected Landowners in proximity of the ROW**--including those owning parcels directly crossed by the ROW and/or Construction easements, access roads or workspaces, those within the PIR, those within the Evacuation Zone. Both conventional demographic descriptions and the more concrete descriptive materials discussed are needed.

(2) **Executives, Managers and staff of the proposing corporations and stockholders** in these companies: this is the population group who have proposed and initially conceived the project and are among those who will benefit from its implementation. Needed data should allow meaningful comparisons to the affected populations within the counties hosting the project's installation. Also comparative data on benefits and negative impacts deriving from the project. (e.g., comparison of direct payments attributable to the project: overall payment for easement vs value of percentage of salary/bonus/stock dividends attributable to MVP-related work).

(3) **Commissioners, managers, and staff of the FERC:** this is the group whose decisions will revise the route and whose approval is needed for implementation. Data needed are similar to (2) above.

(4) **The end users of the energy involved in the project** as "transportation infrastructure"—demographic profiles and data similar to 2 and 3 above—divided into sub-groups within the proposed markets reported county-by-county to facilitate comparisons to counties directly impacted by implementation.

Comparisons of impacts on 'advantaged' vs 'less-advantaged' sub-groups. As suggested by demographic data already reported in the DEIS, Summers County has a disproportionate number of low-income, disabled, and elderly citizens compared to either the 'end-user' group or the 'managerial' groups – is there any indication that a greater percentage of **negative effects** likewise accrues to members of the public in Summers County than to members of the comparison groups? Is there any indication that **positive impacts** from the project accrue more fully to one group than to another?

Comparisons of impacts on affected landowners, end-users, and managerial groups: with a more concrete knowledge of the effects of the project on Summers County populations, the DEIS can begin to examine the distribution of effects (both negative and positive) across all these divisions of the public. From this, we can infer any disproportionate concentration of particular effects of the project. It could be, for example, that access to necessities (such as food and water and winter heat) involves damages attributable to the MVP that are likely to occur with some regularity among affected citizens in Summers County but are essentially unknown in some other subgroups. Or, for another example, direct economic benefit in the form of direct payments from MVP may be a more widespread phenomenon (affecting MVP

IND 826-19 cont'd

stockholders and employees as well as local landowners), yet still revealing substantial and significant variation within some sub-groups.

IND 826-20

Beyond this research, however, exploring issues of environmental justice will lead to additional discussions and research. For example, in evaluating the socioeconomic impact of the proposal on Summers County, a major concern will be the effects of the pipeline's presence on Emergency Services. While the DEIS contains some fairly complacent excuses for MVP in relation to this issue,[20] it is perfectly clear that neither the Applicant nor the Agency has developed any sense of the costs involved. As I noted in an earlier comment "Given the limitations of the PIR as a measure of the physical danger associated with a pipeline explosion, and given the character of the area through which the EQT/MVP proposes to place the line, it is crucial for citizens and the FERC to review the guidelines for placing transmission pipelines, and to review the issues surrounding fire safety in affected areas. Specifically, I request the following materials:

(1) Given the possibilities of serious fire danger related to the MVP, the company must prepare a full report and mapping of the following county-by-county data for the original route and all alternatives:

a. The relation of the line to **all existing roadways** in a way clearly revealing the carrying capacity/width of each;

b. The relation of the line to **all existing fire response units**;

c. Identification of **all firefighting equipment available to each unit**;

d. The **number of residences potentially to be evacuated** from each road segment and the **direction of egress for each group in case of emergency**;

e. Estimated travel **time between fire units and selected sites** along the line (to include sites more or less easily accessible and sites for which access would be highly difficult);

f. Identification of any **supplementary units or equipment available and travel time** to sites;

g. **Similar information for all emergency service units** such as ambulance service and hospitals.

[20] For example, on page 4—314, "we conclude that the project would not have significant adverse impacts on public services. Besides making monetary contributions to first responders, Mountain Valley would repair all roads used for access that may have been damaged....tax revenues...should far exceed the cost of local public services." There is no data detailing the costs envisioned for local emergency responders, although the expense of equipment upgrades alone could be enormous.

IND826-20 As discussed in section 4.12 of the EIS, the Applicants would design, construct, operate, and maintain the proposed facilities in accordance with the DOT's Minimum Federal Safety Standards in 49 CFR 192.

IND 826-20 cont'd

(2) Prior to approving the MVP, the FERC must conduct (or commission) research into the **probable effects** of a range of pipeline explosions (to include a 42" line at 1,480 psi) on various typical **rural circumstances** that would parallel the research on urban explosions reported in Document #20150615—5225. For instance, we should have data on the *probable rate of secondary fires* occasioned by an untreated initial explosion; the *distance beyond the PIR at which such fires would be likely to occur*; and related data for the destruction of houses, barns and other *typical rural structures*. **One research report discussed in detail in my earlier comment showed the extent of crop field damage resulting from an explosion near Appomattox, VA, but a far greater range of data is needed. For instance, what is the safe proximity to a rupture and explosion for stored fertilizers? Of a full haybarn? For a shed housing fuel for farm machinery. Understanding so-called 'secondary fires' in such circumstances will require substantially different treatment from predicting damage to urban or suburban housing.**

IND 826-21

(3**) FERC must demand commitments from MVP to provide the financial support needed to bring all affected firefighting units up to professionally-established standards** of training and equipment that would allow volunteer units to respond to an MVP-related accident without unreasonable risks to firefighters' lives and safety.[21]

(4) Prior to issuing any decision on the application, FERC must review the **regulations governing the placement of pipelines in relation to inhabited structures,** clarify what these require, and communicate these regulations clearly and unambiguously to the public and to MVP.

IND 826-22

In addition to these practical requests concerning the safety of the County (as well as all other properties along the pipeline route), I filed another request with FERC discussing the socioeconomic and cultural impacts of the pipeline. [22] That document concludes that, in trying to evaluate the impact of the MVP in the context of the future development of the Appalachian region in general—and of Summers County in particular—FERC must develop some significant research into **current initiatives in the area's economic resources**. The DEIS provides only very generalized data on the number of organic farming operations and tourists-dependent small businesses, where a far more detailed study is required to understand the likely long-term effects of the proposal and thus the degree to which the local economy is likely to be affected. **In the absence of other information, the study of costs by Key-Log Economics gives us a very good start on this kind of data and its inclusion in the revised Environmental Impact Statement will greatly enhance the public's understanding of this issue.**

[21] In one of their most recent submissions, the Applicant comments on a seemingly informal program of contacts and potential training sessions with local emergency providers, and implies that 'contributions' might be made to local volunteer fire departments. The extraordinary circumstances surrounding gas-line fires are entirely MVP's responsibility if the line is built, and threats to the lives of the local population should not be so easily dismissed. FERC faces an ethical and moral responsibility here that cannot be dismissed by bureaucratic boundary-drawing.

[22] Docket PF15-3-000, document #20150616—5168.

IND826-21 Section 4.9.2.3 discusses Mountain Valleys' coordination with local emergency service departments.

IND826-22 We discuss the KeyLog studies in our EIS, and find that those studies make sweeping generalizations about impacts without any facts to support those statements.

IND 826-22 cont'd

Notice that, given FERC's proposal for the development of a regional utility corridor, such research seems especially important, in light of the likelihood that, should the MVP route be approved, subsequent pipeline requests are more likely to be proposed for co-location through the county. This possibility has already been broached in early discussions of the so-called Appalachian Connector Project, and is made more threatening by the fact that at least some MVP easement contracts have required the right to place a second line in the purchased easement. To foresee such cumulative impacts on the county is—according to NEPA procedures—an important dimension of FERC's appraisal of the Environmental Justice aspects of the MVP application).

Beyond the immediate empirical data needed to determine just where the region stands in relation to the pipeline proposal, there is an important adjustment of perspective which could be provided by historical and social-analytic research into the history of the region's experience with extractive industry in general. Clearly the contemporary collapse of the coal industry is a grim reminder of the region's repeated experience with the social, political and economic damage that follows such a 'bust.' And yet such a collapse is almost guaranteed with an extractive industrial development: a quick rise to a flourishing economic 'boom' will necessarily be followed by a decline. That fall may be a gradual effect of shifting markets, or the dramatic collapse following the over-exploitation of the resource. Both things have happened in West Virginia and the rest of the Appalachian region, and some recent reports about the Marcellus/Utica gas fields suggest such things are not beyond imagining now. Understanding those previous disasters could well model better approaches to energy extraction in the present case.

IND 826-23

4. CONCLUSION

In concluding my present comment, **I want to return to the issue of environmental justice as the concept has been presented by the EPA: "Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."** The passage continues, saying that "**the nation will have attained a measure of Environmental Justice when "everyone enjoys the same protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn and work."**[23]

The population of Summers County West Virginia is in a number of ways vulnerable to exploitation by an industry fixated on profiting from a perceived national need for additional energy. The county includes large numbers of adults and children living in poverty, large numbers of persons with disabilities, large numbers of senior citizens—all at rates well-above national averages, and, in most cases, above state averages for West Virginia. The population of the county needs and desires additional employment—a benefit presented in glowing

[23] See www3.epa.gov/environmentaljustice.

IND826-23 See the response to comment IND826-17 regarding our assessment of impacts in relation to environmental justice communities.

IND 826-23 cont'd

promises by the energy industry, but realized in far more modest terms.[24] For such a population, land-purchase offers can seem a tempting solution to pressing short-term financial needs—but could in the long-term result in major financial losses through restricting the value of citizens' primary asset: their homes and real estate. And sale could result in numerous other, more immediate losses as well—in water, in use of the land, in a certain degree of independence, and more.

The Applicant has promised high levels of cooperation with landowners in planning the MVP route—and then proceeded to file lawsuits against those who choose not to cooperate in their surveys. The company guarantees high levels of safety—and then routes potentially dangerous lines extremely close to people's homes and outbuildings. The company promises water protections—and proposes a cheap but destructive method for 99 stream crossings in Summers County alone, including a major river dangerously close to a Public Service District water intake system. And while the company promises to pay fair prices for the land they wish to appropriate, the damages the pipeline poses will endure for years beyond the useful life of the line—undermining uses of the property and future sales "forever—or at least as much as one hundred years."[25]

At the very least, the pipeline is expected to bring the company substantial profits for twenty years (the minimum projected profitable operation of the line mentioned in FTI's economic analysis). But for county residents, the money offered for their property will not last half that: for the landowner who loses a woodlot, payments will go for winter heat; for the landowner whose well is affected, payments will go to Kroger's at a dollar a gallon for drinking water. Such losses may well be repeated throughout the operational life of the line as property is sold and resold at reduced prices and the loss is multiplied through a series of owners. And for any resident affected by a pipeline leak, by a fire?

Clearly, when a multi-billion dollar corporation can build a disruptive, environmentally damaging, and potentially-disastrous 42" gas transmission line through a place as vulnerable as Summers County—while the corporation itself remains safely ensconced hundreds of miles away, collecting its profits from—and distributing its benefits to—an entirely different

[24] It is a matter of some bitter amusement to local people that the all the promised 'good paying jobs' advertised by MVP have so far been filled by pleasant young men from Oklahoma, Missouri, Utah, and other western states. In truth, MVP's vaunted employment boom extends to no more than 29 fulltime positions in all of West Virginia for operating the pipeline. Resource Report 5, Socioeconomics, pg. 5--28. Even in construction jobs, 75% of employees will be 'non-local' workers (Resource Report 5. Socioeconomics, pg, 2—25).

[25] According to an MVP engineering representative at the company's Hinton 'open house' on January 14, 2015, this is how long the treated pipes will last in the ground. **Another relevant exchange from that odd meeting came in a discussion with two young men who claimed to be MVP lawyers. One of these gentlemen explained (as I transcribed in my notes after leaving) that 'when the FERC approves our application, they will basically be saying that some of you must suffer so that others can profit.' That is a large part of the burden of my present argument.**

IND 826-23 cont'd

population…**clearly, we have not yet arrived at the point where "everyone enjoys the same protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn and work."**

Without a principled examination of the issues it purports to 'discuss', and without the data to examine those issues, neither the FERC nor the cooperating agencies have anything upon which to base any 'consideration' of those issues which must occur under the provisions of the National Environmental Policy Act. The current DEIS for the Mountain Valley Pipeline should be withdrawn.

Sincerely,

Thomas Bouldin, Intervenor

Pence Springs, West Virginia

Cc:

Ted Boling, Associate Director for NEPA, Council on Environmental Quality

Jeffrey Lapp, Associate Director, Office of Environmental Programs, EPA Region 3

Barbara Rudnick, NEPA Team Leader, EPA Region 3

Ben Luckett, Senior Attorney, Appalachian Mountain Advocates

INDIVIDUALS

IND827 – Susan Crenshaw

20161222-5186 FERC PDF (Unofficial) 12/22/2016 1:07:49 PM

IND 827-1 Susan M Crenshaw, New Castle, VA.
Petition from over 1800 citizens to withdraw the inadequate and incomplete DEIS about the MVP.

IND827-1 See the response to comment FA11-2 and LA5-1 regarding preparation of the EIS. The draft EIS was not inadequate, and would not be withdrawn.

INDIVIDUALS
IND828 – Lois Martin

20161222-5225 FERC PDF (Unofficial) 12/22/2016 10:33:23 AM

December 21, 2016

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First St., N.E. Room 1A
Washington, DC 20426

RE: MOUNTAIN VALLEY PIPELINE, LLC/DOCKET NO. CP16-10-0000 ~~F301388

IND 828-1 The purpose of this letter is to express opposition to the proposed MVP route through Roanoke County, Virginia, particularly in the Bent Mountain area. You have received numerous, detailed, well-documented statements of opposition from concerned landowners, scientists and concerned citizens. Please consider their comments that contain a wealth of wisdom after they invested a great amount of time and research. My letter simply highlights my concerns for the project.

My reasons are as follows:

1. The karst topography of Bent Mountain and other areas in the proposed route. In your profession you are well aware of the unstable environment of karst topography. This will make for very unsafe conditions for the human and animal populations of the area, as well as the employees of MVP. Once this topography is disburbed there is no second change to undo the damages.

IND 828-2
2. The investors and maybe a few employees of MVP are the only individuals that will benefit from the pipeline. It's unconstitutional to destroy another person's property for profit. No one seems to take the landowner's financial loss into consideration. Farming cannot be done on an unstable foundation. MVP is basically causing farmers to lose their livelihood so pipeline workers can be employed and the investors get richer. Furthermore, people cannot inhabit a home next to a pipeline that could explode at a moment's notice and will have a negative impact on their water supply. As we all learned in elementary school, the three basic criteria for human survival are: food, water and shelter. The proposed pipeline puts all three of these survival needs in critical jeopardy for the population along the route. Furthermore, no one will want to purchase the property and of course, local government will still want their property tax. Once again, economic loss to the landowners. Instead of looking at the few jobs that will be gained, please consider the economic loss that will certainly happen.

IND 828-3
3. FERC should also be concerned with the environmental impact MVP will have on endangered species and the wetlands. At least three underground springs start on our property where MVP has staked the pipeline's path. These springs come above-ground, and feed into a branch that leads directly into Bottom Creek. As many people have mentioned in their filings concerning this project, this not only impacts the water supply of Bent Mountain residents but of the citizens of Roanoke, VA and surrounding areas.

IND 828-4
4. The pipeline will forever damage the beauty of the Virginia Mountains. This will impact the tourism industry economically as well as destroy the natural environment permently. In nature,

IND828-1 Karst is addressed in section 4.1 of the EIS.

IND828-2 See the response to comment CO2-1 regarding benefits. See the response to comment IND281-2 regarding jobs in Virginia. See the response to comment IND332-1 regarding farming. See the response to comment IND2-1 regarding safety. See the response to comment IND3-1 regarding drinking water. See the response to comment IND12-1 regarding property values.

IND828-3 The EIS provides a discussion of springs and wetlands in section 4.3. Endangered species are addressed in section 4.7.

IND828-4 Visual resources are discussed in section 4.8. Tourism is addressed in section 4.9 of the EIS. See the response to comment CO14-1 regarding blasting.

IND 828-4 cont'd

you do not get a second chance. We only have one Earth and we need to be good stewards of it. We have a rock formation in or near the pipeline's path. The archeologists that came to survey took numerous pictures of it. However, the lead archeologist would not dig near it. It's like he was purposely not digging around it because he was afraid he might find something that would result in the pipeline not being routed through our woods. The crew chief told me that the formation would not be disturbed during blasting because they blast "inward" not "outward". Not sure if he really believed what he was saying or he was insulting me. I find it interesting the path the pipeline is taking, it's like they are going out of their way to go through certain landowners property. On my neighbor's land, there is a 90 degree turn. What are the engineers thinking?

IND 828-5

5. Except for people that stand to gain economically from the MVP project, people that know what is at stake are against the project even though it does not impact them directly. Though every citizen for or against the project will be impacted. My family has lived in the area for over 100 years. It doesn't seem right that a "for profit" company will be able to forever damage it for their gain. The company didn't even give Roanoke County officials the curiosity of contacting them before it contacted the owners via letters of their plans. The company doesn't seem respectful and is moving very fast and Virginia experts (i.e. DEQ and local governments) do not seem up to the task of fully understanding the impact this project will forever have on the state. We have a lame duck governor that seems to be pushing it so he can brag of its economic gain, plus, it's a possibility he could benefit financially as well. I'm very skeptical of him especially after his financial contribution to the FBI director's wife's political campaign. Mrs. Clinton was for open borders and we all know of his friendship with the Clintons. Maybe the open borders would be a way to transport this gas out of the country. Judges seem afraid to rule against the pipeline because they are afraid of losing their jobs. If a company is behaving in this matter even before the project begins, it will only continue to get worse.

IND 828-6

6. I have always been under the impression that Federally protected land, where citizens were forced from their homes in order to make a natural preservation for future generations would be protected from private companies. Where is the protection? For example, a commercial vehicle is prohibited from driving on the Blue Ridge Parkway; however, MVP is proposing destroying a part of the Parkway along its route. How is this possible? Not to mention, how will MVP be allowed to even drive its equipment on the Parkway? Will that not be a violation of the law? What makes this company above the law?

I could go on and on the numerous reasons the project doest make sense and the personal impact this will have on my family. My mother should be enjoying her golden years; not worrying some cold, greedy company will forever destroy her home place and my children's heritage. I plead with you to consider the opposition filings of people that have an expertise in their fields. The pipeline route raises very serious and dangerous problems that can never be reversed once they are done. Thank you for your time and consideration.

Sincerely,

Lois W. Martin, Roanoke, Virginia

IND828-5 See the response to comment CO2-1 regarding benefits.

IND828-6 As described in section 4.8 of the EIS, the pipeline would be bored beneath the BRP. The Applicants would adhere to all federal, state, and local laws.

IND 829-1

I'd like to write in opposition to the Mountain Valley Pipeline. I oppose all of the Amendements to the Jefferson National Forest Management Plan and want to preserve our old growth forests. A utility corridor would be dangerous in our karst topography, and I would ruin our magnificent views. Building this pipeline is in direct opposition to the current Forest Management Plan.

This pipeline will not bring jobs or energy resources to our region. It will only add to the tragedy of climate change. The MVP goes right through one of our local historic districts, the village of Newport. Destruction of this kind is not mitigatable.

IND829-1 The EIS provides a discussion of karst in section 4.1, visual impacts in section 4.8, climate change in section 4.13, and cultural resources in section 4.10. See the response to comment IND281-2 regarding jobs in Virginia.

INDIVIDUALS

IND830 – Thomas and Betty Gilkerson

December 12, 2016

Dear Secretary Bose,

IND 830-1

We, Thomas and Betty Gilkerson, landowners very near (adjacent) to the proposed Mountain Valley Pipeline Route in Monroe County, FERC Docket# CP16-10-000 would like to comment on the DEIS and other issue regarding this project. As we stated in our Motion to Intervene on November 27th, 2015, we are very concerned about our water at our vacation home on Ellison's Ridge in Monroe County WV, which comes from a well that could and probably will be impacted by this project. We are also concerned that the value of that home could become nearly worthless and unusable due to the compromised air, water, and views among other things. The area will be greatly impacted by all facets of the construction and operation of this project, as it currently exist, which as stated previously, is near our land in one of the most beautiful and pristine areas of WV.

View from our front deck from the vacation home on Ellison's Ridge Monroe County WV, overlooking the Hans Creek Valley in the foreground and Flat Top Mountain in Raleigh Co in the distance. Photo taken December 11th 2016.

IND 830-2

If built as proposed the pipeline corridor would run (left to right) off the top of Ellison's Ridge, across the valley directly below our house and return to the top of Ellison's Ridge following the ridge below our house in such a manner to look like an airport runway. We would have a 180 degree view of the corridor.

IND830-1 See the response to comment IND3-1 regarding drinking water. See the response to comment IND12-1 regarding property values. The EIS provides a discussion of air quality in section 4.11.1, water resources in section 4.3, and visual resources in section 4.8.

IND830-2 Comments noted.

IND 830-3

We do not believe the proposed Mountain Valley Pipeline (MVP) is in the public interest. It poses very real threats to public health and safety in West Virginia. It will have permanent adverse impacts on the local environment.

The Draft Environmental Impact Statement (DEIS) issued by the Federal Energy Regulatory Commission (FERC) rightly concludes that constructing the pipeline will have significant adverse impacts to forests. However, the DEIS fails to fully account for the other threats posed by the MVP. There is no way to justify the risk of an explosion or leak to the people who live within the quarter-mile from the blast radius of the proposed pipeline.

Many people living in the region rely on headwater streams, springs and wells and other water resources that stand to be significantly impacted by this project. Yet the DEIS dismisses these concerns, saying only that developers would "evaluate any complaints" and "identify suitable settlements" in the event of contamination. Once the water is contaminated you cannot fix it.

IND 830-4

Because of the vulnerability of critical water resources in the karst areas at the base of Peters Mountain and on Ellison's Ridge, I support the requests that have been made by the Monroe County Commission and others, that the FERC require an independent, comprehensive hydro geological study of the public and private water resources in Monroe County (especially in areas of karst) before issuing a Revised Draft Environmental Impact Statement or a Final EIS, or approving an MVP route through Monroe County. I also encourage the GW & Jefferson National Forest office to complete such a study per the request of numerous citizens and citizen groups as well as public officials, on Peters Mountain before any decision is made about crossing this unique aquifer.

IND 830-5

The DEIS fails to adequately address and evaluate the impacts of **Air and Noise Pollution.** Three large compressor stations that have been proposed to move gas along the route in West Virginia, and there most likely will be a fourth sited in Virginia which is quite concerning. FERC expects one of the West Virginia compressors to violate local air quality standards. The FERC must state definitively whether additional compression will be required, and it must consider the environmental impacts of an additional compressor station within the context of the proposed project.

IND 830-6

FERC concedes that there will be permanent adverse impacts to forests. The MVP would cross thousands of acres of prime forest land and habitat for species listed as threatened and endangered. It would cross national treasures like the Appalachian Trail on Peters Mountain and the Blue Ridge Parkway. The AT has stated that the impacts to the AT are severe and would impact the trail like no other project ever. It would also impact the Brush Mountain Inventoried Roadless Areas, Old Growth Forest Areas, Peters Mountain and Brush Mountain Wilderness Areas to name a few. The DEIS says FERC will consult with the U.S. Forest Service to minimize impacts. However, the Forest Service has already commented that the sum of these crossings will result in significant impacts. The U.S. Forest Service has raised several of these forest impact issues, yet they have not been addressed by FERC or the project partners.

The project will also permanently impact farmland, fragile karst areas and fragment habitats of species listed threatened or endangered. Yet again, the DEIS waves off these concerns, only saying that FERC

IND830-3 The Commission would decide if the projects are in the public interest. Safety is discussed in section 4.12 of the EIS. See the response to comment FA15-5 regarding forest impacts. See the response to comment IND3-1 regarding drinking water.

IND830-4 See the response to comment CO34-1 regarding hydrogeological studies.

IND830-5 Section 4.11 of the EIS provides an assessment of air quality and noise impacts. See the response to comment LA15-5 regarding changes to the proposed MVP.

IND830-6 See the response to comment FA15-5 regarding forest impacts. The EIS analyzes impacts to forest, including old growth and core/interior forest in detail in sections 3, 4.4, and 4.8. Section 4.8 of the final EIS provides a revised discussion on the ANST and the BRP. Section 4.7 of the final EIS has been revised to provide updated consultation with the FWS. The FS is a cooperating agency and assisted in preparation of the EIS.

IND 830-6 cont'd

will consult with the U.S. Fish & Wildlife Service or will 'mitigate" these concern while offering not real plans on how this could be done. The EIS process should not move forward until all concerns raised by the United States Forest Service, the Appalachian National Scenic Trail, the BLM and citizens are addressed.

IND 830-7

I would also like to comment on the Amendments to the USFS Land Management Resource Plan Amendments as proposed by the NOAI contacted as part of the DEIS for the MVP.

I support none of these amendments to the forest plan. National Forest Service land is **for ALL Americans.** Preservation of our heritage, our rights, our water and our natural resources provided by the Forest is a privilege of all citizens and not something that should be given away to a corporation for financial profit.

I urge that you consider the amendments with due caution for how they will impact the future of the Jefferson National Forest as well as the citizens adjacent to the forest for at least 40 miles. Public input is essential, and should not be ignored by the Bureau of Land Management, the Army Corp of Engineers, or the USFS. The proposed amendments are disturbing and all due caution should be considered for how they will impact the future of the Jefferson National Forest (JNF) and generations to come. Allowing the pipeline to be constructed within the Jefferson National Forest (JNF) would violate the trust citizens have placed in our government to protect and steward a national treasure. This proposed pipeline crosses numerous delicate ecosystems, karst regions, and mountainsides and private properties.

The proposed Amendments would permit MVP to exceed many environmental restrictions, which is not acceptable. The environmental regulatory protections that are already in place for federally protected forest land and watershed areas should not be ignored or over-ridden.

I feel that these regulatory protections should be more stringent for such a project instead of the minimal environmental protections that now exist. The removal of old growth trees within the construction corridor is inexcusable. They are symbols of our heritage and should be protected and not cut down. They are unique part of the JNF and should not be allowed to be destroyed forever. Allowing MVP to avoid the environmental controls mandated by NEPA strictly for a for-profit company and in total disregard of the environment and the effects on citizens is troubling.

The pipeline and the gas transported will provide no additional benefits to the citizens in this area (an issue already decided by the Monroe County Court in August of 2015 and reinforced by the WV Supreme Court in November of 2016) but it will have a detrimental impact on the environment affecting all citizens of the area for generations to come. There have been many questions as to the need for this pipeline. Pipelines already in existence need proper maintenance to improve efficiency of transport and prevent ongoing environmental pollution. It appears the purpose of the MVP pipeline is for the sole interest of a few private corporations to make a substantial profit at the expense of our National Forest and local citizens.

Recreation and tourism are critical to many communities, especially in Monroe county, and surrounding counties in WV and VA. A prime reason many people, including us come here is for health, wellbeing and relaxation. The impacted by a pipeline corridor across the area, especially Monroe County, Peters Mountain and the Jefferson National Forest would cripple the important tourism industry of the area.

IND830-7 See the response to comment FA8-1 regarding Amendment 1. See the response to comment FA10-1 regarding Amendments 2, 3, and 4.

IND 830-7 cont'd

While each amendment is individually and separately without merit, Proposed Amendment 1 is the most egregious and constitutes a serious violation of the basic social contract between FERC and us, the citizens

I strongly oppose the proposed 500 ft Designated Utility Corridors. A 500-foot Right Of Way is ridiculous. Everyone can comprehend the length of a football field. This would create a corridor that would be nearly **twice** the length of a football field! The Right of Way would be the initial step for future expansion, with the potential for more pipelines, electrical lines, water lines, etc., to be constructed. The USFS needs to protect the JNF from not only the immediate environmental impacts of this pipeline but possible future pipelines and other utilities. The impact of the entire width of the designated corridor and whether that conflicts with the forest plan must be evaluated, as well as the impacts to private landowners within that same corridor, as well as those nearby.

This proposed amendment would not only create a "Utility Corridor" across he JNF, but would also create a Pipeline/Utility Alley in Monroe, Summers, and Greenbrier Counties, WV and Montgomery, Craig, Alleghany and Roanoke Counties, VA. The damage done by this "Alley" across these counties would be severe, but the greatest impacts would be to private landowners in counties on each end of this corridor, as all future projects would have to traverse these areas to enter and leave the corridor across the National Forest Lands. Thus, many landowners in these adjacent counties could become nothing more than custodians of the utilities lines and could not use their land for anything, making it useless and worthless at the same time.

I oppose the proposal to permit exceptions to the soil and riparian corridor conditions. I believe that Peters Mountain Wilderness Area, The Appalachian National Trail, Mystery Ridge, Brush Mountain Wilderness and Road-less Areas, the Old Growth Forest would suffer substantial damage with the construction. I find it objectionable to allow the construction of the MVP pipeline to exceed restrictions on soil and riparian corridor conditions. These exceptions in the fragile forest should not be allowed. MVP should comply with the current restrictions in place regarding soil and riparian corridor conditions and not be allowed to exceed them. I stress that the riparian buffer zones along streams in the JNF should remain intact to minimize adverse effects to the water bodies. Furthermore, I firmly believe that if soil conditions are exceeded, both ascending and descending Peters Mountain, Sinking Creek Mountain, and Brush Mountain, it will cause silting of the water bodies below, damaging critical habitats and drinking water source.

Amendment 3, like all the others, would allow the removal of old growth trees within the construction corridor. Ancient woodlands have attained unique ecological features because they have not been disturbed. They are a ***rare natural resource***, and could never be replaced once destroyed. To destroy these marvelous trees would be reprehensible. This great National resource should not be sacrificed for an industry's private gain. The existing regulations are sufficient and should not be changed to remove more old growth trees. It would also have many of the same detrimental effects as have all the proposed amendments. ***The forest plan should not be amended as Proposed in Amendment 3***.

The forest plan should not be amended as requested in Proposed Amendment 4 to allow the MVP pipeline to cross the Appalachian Trail on Peters Mountain. The Appalachian Trail is so vital to the identity of our area and its economy. Allowing the Scenic Integrity Objective to change from High to Moderate near the crossing of the most famous and prestigious national scenic trail in the U.S. is inconceivable. A recent statement released by the Appalachian Trail Conservancy said: "***Our own***

IND 830-7 cont'd

analysis concurs with the statements of the United States Forest Service and suggests that the proposed Mountain Valley project represents a serious threat to the scenic value of the A.T. well beyond the scope of similar projects - as many as 19 prominent AT vistas may be severely impacted from this project, many of them viewing impacts as they occur on USFS land….. These amendments would not only be unprecedented, but would significantly erode the value of the Appalachian Trail which the public has spent millions to protect."

I fear the Jefferson National Forest and its fragile ecosystems will be so irreparably damaged by the construction of MVP that it will never be the same again. I find it hard to believe the proposed amendments which would vastly expand the amount of infrastructure – transporting as-yet-undefined materials – would even be considered by FERC. In spite of the insistence on the part of FERC and Mountain Valley Pipeline that any disruptions to local communities would only be temporary and limited to the construction phase, Proposed Amendment 1 effectively guarantees disruptions in perpetuity for our communities.

I strongly oppose these amendments to the Forest Service Plan. Enacting these amendments will irrevocably harm the invaluable cultural resources we derive from the forests, streams, and other fragile areas of the National Forest. These amendments will also have lasting negative impact on our property values, and disrupt many carefully planned retirements via loss of equity in homes near the route.

I strongly condemn the utter disregard for basic science and human health concerns evident in the four proposed amendments. Enacting these amendments will threaten not just the health of our soil and streams, but poses a lasting threat to our groundwater aquifers and human health. Once contaminated, our aquifers will ***never*** return to their original quality, depriving my generation as well as future generations of this resource. It also poses a threat to many endangered and rare species found in and near the JNF.

The four proposed amendments constitute an unconscionable and unjustifiable burden on us, the citizens and stakeholders, and absolutely must not be approved. I, therefore, implore the United States Forest Service, the Army Corp of Engineers and the Bureau of Land Management not to grant a right-of-way in response to the MVP application.

For these reasons, I urge you to find that the Mountain Valley Pipeline is not in the public interest and reject its application.

Sincerely,

Thomas and Betty Gilkerson

INDIVIDUALS

IND831 – Betsy Hughes

20161222-5163 FERC PDF (Unofficial) 12/22/2016 12:29:24 PM

Betsy Kay Hughes, Salem, VA.
Dear Secretary Bose,

IND 831-1

I am a citizen of Salem, Virginia and I am writing in regards to the proposed construction of the Mountain Valley Pipeline. I do not have property directly affected by this gas line, but I am taking this opportunity to voice my opposition to it and to express my concerns of the impacts that this pipeline will have on our forests and the habitat they provide for a variety of wildlife.
According to the DEIS (Section 4.5.2.2), the Mountain Valley Pipeline would permanently impact about 359 acres of contiguous forests in Virginia and about 886 acres in West Virginia. Constructing the Mountain Valley Pipeline would fragment large forested tracts which provide habitat for a variety of wildlife. Some of the impacts mentioned in the DEIS are breaking up habitats into smaller patches, creating edges, species predation, species displacement, unfavorable bird habitats, smaller habitats, smaller population sizes, lower reproductive success, decreased quality of interior forest habitat, and decreased species fitness.
According to the USDA on Habitat Fragmentation:
"Habitat fragmentation diminishes the landscapes capacity to sustain healthy populations or meta-populations in four primary ways: loss of original habitat, reduced habitat patch size, increased edge, increased isolation of patches, and modification of natural disturbance regimes".
"Perhaps the most significant adverse impact of fragmentation is simply the loss of original habitat. Research findings suggest loss of habitat has a much greater impact on wildlife populations than the change in spatial arrangement of habitat areas."
"Fragmentation of a landscape reduces the area of original habitat and increases the total lineal feet of edge, favoring species that inhabit edges at the expense of interior species that require large continuous patches. Ecologists, such as Wilcox and Murphy, believe that habitat fragmentation is the most serious threat to biological diversity and is the primary cause of the present extinction crisis.
https://prod.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_015259.pdf

IND 831-2

According to an EIA independent study, in 2008, there were more than 305,000 miles of pipeline in the United States.
https://www.eia.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/mileage.html
I am sure that the number has grown since then.
And according to the Virginia DEQ, it looks like there are about 10 pipeline proposals or projects pending.
http://www.deq.virginia.gov/Programs/EnvironmentalImpactReview/NEPADocumentReviews/MajorNEPAProjects/NaturalGasPipelinesinVirginia.aspx

If we look at just the Mountain Valley Project, it could be said that there will only be "minimal impacts", but I disagree. If we continue on this path of overbuild and not looking at the cumulative impacts over time, what habitat will be left for humans and wildlife?
We have enough pipelines to supply what we need. And with the future of energy sources changing to more environmental friendly options, there should not be an increase in the need for more natural gas pipelines.

IND831-1 See the response to comment FA15-5 regarding forest impacts.

IND831-2 See the response to comment FA11-2 regarding need.

IND 831-2 cont'd

According to the DEIS (Section 4.5.2.2), Mountain Valley will restore the pipeline corridor using native seed mixes and use vegetation management techniques to promote growth of ground cover species.
The only thing that will save what the pipeline will destroy is not to build the pipeline.
I urge you to keep in mind the damage that will be done by the proposed Mountain Valley Pipeline and keep in mind other conservation measures that reduce the need for the pipeline.
Most sincerely,
Betsy Kay Hughes

Letter to ferc

IND 832-1

I have delayed in contacting FERC regarding the DEIS for the Mountain Valley Pipeline because I have been reading almost all of the other Interveners' posts over the past months and I am humbled by the depth and breadth of information contained in those filings. If only 1% of the objections contained in those documents was taken seriously by a federal agency, citizens' rights and environmental quality would be safe from this kind of invasive project.

I have also endeavored to read the DEIS itself and it absolutely is not transparent. I will digress to mention I have an MA degree in Social Science from Virginia Tech and an MFA from Syracuse University in Visual Arts and may reasonably be expected to be able to read and interpret maps. The maps included in the document are useless from the point of view of identifying specific areas or routes through them. While the MVP milepost numbers may be useful to the MVP developers they mean nothing to the general public. I have lived in the New River Valley since 1971 and in Newport since 1993. I lived in the Mount Tabor area shortly before that. Though I know these areas intimately from living here, hiking, bicycling, and visiting with friends and neighbors I am unable to accurately determine where exactly the proposed routes would pass through these areas. I understand from others they have had similar difficulties reading the maps.

The addition of several alternative routes further muddies the waters. All those maps/routes are equally unreadable and problematic to try to carefully assess. I believe the lack of transparency in the maps and the document in general are intentional and show blatant disregard for citizen input.

Many highly qualified knowledgeable and well-regarded economists, ecologists, geologists, soil scientists, hydrologists, biologists , local historians, chemists, environmentalists, foresters, general citizens and citizens' groups with broad local knowledge have provided over a thousand pages of significant responses in opposition to the DEIS. The time and effort these experts have put in to block this project is huge, so clearly there is strong opposition to it. Unlike the large amounts of MVP-generated material, we had limited to nonexistent budgets to produce credible reports.

Any "regulatory agency" which would accept any of this pipeline route over the experts' objections is clearly not an impartial entity and is guilty of protecting the special interests of the fossil fuel energy and fossil fuel infrastructure industries. Reasons for the pipeline are egregiously listed in the DEIS while the real reason – profit for the developers and their stockholders is not mentioned. He DEIS is not credible, but is purely self-serving. The interests of the property owners, the National Forest protected lands, and the environment along the route must be protected for the common good.

IND832-1 See the response to comment IND148-3 regarding maps in the EIS. Given the length of most alternatives, the maps in section 3 of the EIS are intended to provide an overview of the alternative route. See the response to comment FA11-2 and LA5-1 regarding preparation of the EIS.

INDIVIDUALS
IND833 – Robert Miller

IND 833-1

Robert C. Miller, Blacksburg, VA.
As a clinical psychologist who has lived and worked in the New River Valley for over 28 years, as well as being a native of Appalachia, I am writing to voice my opposition to the proposed Mountain Valley Pipeline (MVP). Psychological trauma occurs when persons experience a loss of place and healthy environment, as is documented with Appalachian citizens who have experienced environmental degradation resulting from mountain top removal. Even now psychological reactions such as major depression and panic disorder are increasing for individuals impacted by MVP. I am currently treating patients whose stress resulting from the proposed pipeline has caused or increased severity of mental health problems and resulted in lost time at work. Proponents of MVP argue the pipeline is necessary for economic development ignoring that such projects contribute to mental illness, which has a major drain on the economy. The National Alliance on Mental Illness (NAMI) puts the cost of serious mental illness in America at $193.2 billion in lost earnings per year. The emotional and psychological costs and consequences of projects such as MVP are difficult to measure but examples of how environmental crises contribute to mental illness and economic loss are readily available. For example, the current water crisis in Flint Michigan is causing mental illness to rise in that community. Protection of the environment is essential to good mental health and sustaining a strong economy. MVP is a threat to health and the economy and should not be built.

IND833-1 No one would loss their place because of the MVP. Mountain Valley merely seeks to negotiate easements. Economic impacts are discussed in section 4.9. The Commission has not yet made a decision about the projects.

IND 834-1

In order to accommodate the visual and environmental damage that would be caused by the Mountain Valley Pipeline, the U.S. Forest Service agreed to **lower the Jefferson National Forest Management Plan standards for water quality, visual impacts, the removal of old-growth forest, and the number of simultaneous projects passing through the borders of federally protected land**. This unprecedented change is extremely ill-considered, not only because it would permit the Mountain Valley Pipeline to destroy thousands of acres of pristine forest, but it would open the gates for future infrastructure projects to cause similar destruction. **All of these changes were made without sufficient public review or input from other partners — a rash and dangerous change from the standards previously established through decades of cooperation.**

The Jefferson National Forest, like all National Forests are held in trust for all people. Species requiring large uninterrupted tracts of land require the forests for their survival. The communities adjacent to Jefferson National Forest – Giles County, Montgomery County, and other communities along the Mountain Valley proposed pipeline routes – would face serious economic harm from decreases in tourism to Cascades recreation area, the AT, and many other unspoiled viewsheds in the area including, but not limited to Angel's Rest, Peters Mountain Wilderness, Sinking Creek Mountain, Brush Mountain.

The originally proposed 125 foot corridor for a 42" gas pipeline is unacceptable on numerous counts. The recently requested changes to the USFS Land Use and Management Plan for rezoning to allow a 500ft wide "Utility Corridor" further increases the likelihood of serious environmental damage through National Forest lands and properties utilizing natural spring and well water in the surrounding counties

IND834-1 See the response to comment FA8-1 regarding Amendment 1. See the response to comment FA10-1 regarding Amendments 2, 3, or 4.

INDIVIDUALS

IND835 – Lynda Curtis

20161222-5162 FERC PDF (Unofficial) 12/22/2016 12:28:55 PM

Lynda Curtis, Leesville, SC.

IND 835-1

I am 100% opposed to allowing the Atlantic Coast Pipeline, Mountain Valley Pipeline to proceed.

In the environmental review for the MVP it states they will "reduce impacts when crossing karst terrain". As it is now, there are no impacts from a gas pipeline so this should state they will "increase impacts when crossing karst terrain".

In the environmental review it states their plans for "reducing impacts when crossing steep topography". As it is now there are no gas pipelines there so it should correctly state their plans will "increase impacts when crossing steep topography".

In the environmental impact statement it says they will "reduce impacts when crossing organic farms". As it is now there are no gas lines crossing the organic farms. So it should state they will "increase impacts when crossing organic farms".

In the environmental impact statement it says they will "reduce impacts on water resources". This should state they will "increase negative impacts on water resources".

In the environmental impact statement it says they will "reduce impacts on birds, other animals and plants". As these species are currently NOT being impacted by this industry the statement should say they will "increase negative impacts on birds, other animals and plants".

IND 835-2

The entire goal of the Atlantic Coast Pipeline is for specific businesses to make a ton of money. There are not thousands of people in the areas of impact who are screaming, pleading for access to more natural gas. These businesses are NOT altruistic companies who are doing all of this planning, building, etc for "the good of the people".

Therefore, with the incredible loss of habitat, homes, farmland, clean air, clean water, migratory birds, mammals, reptiles, amphibians, invertebrates, plants, there is no way this should proceed any further.

FERC states there will be adverse effects to the environment "but they will be reduced...". This tells me that FERC is helping businesses make a TON of money at the expense of the above. This should not be a goal of the Federal government.

Just this week there was a horrible gas explosion in Ohio. In October, several people were injured when a gasline exploded in Portland. This will continue to happen and would happen in the proposed MVP area. It's a matter of when, not if.

Please deny this permit and advise these businesses to look for other ways to make a ton of money. Tell them you are planning to protect the environment and the citizens from this invasive industry.

IND835-1 The text referred to by the commentor is located within the Executive Summary of the EIS. This section states that Mountain Valley would implement the measures outlined in its various resource-specific mitigation plans "to reduce" impacts. The statements do not use the word "will." These are statements about how mitigation would be achieved if the projects are approved.

IND835-2 It is assumed the commentor inadvertently stated ACP rather than MVP. See the response to comment FA11-2 regarding need. See the response to comment IND2-1 regarding safety.

INDIVIDUALS

IND835 – Lynda Curtis

Thank you, respectfully,
Lynda Curtis
117 Alice Howell Lane
Leesville, S.C. 29070

William L Queen, JR, Richmond, VA.

IND 836-1 As an avid hiker, mountain biker, and skier in the areas of this projected pipeline, I am greatly disturbed by the particular path selected and its lack of consideration of historic, social, and environmental impacts. As an Episcopal priest who is also very committed to protecting God's earth, which does not belong to us, but is given to us for our best efforts of stewardship and conservation, I do not believe that this project is in the best interests of such conservation. I urge a serious reconsideration of this project.

IND836-1 Historic resources are discussed in section 4.10 of the EIS; socioeconomic impacts are addressed in section 4.9.

INDIVIDUALS

IND837 – Steven Hodges

December 22, 2016

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

Re: Comments on Draft Environmental Impact Statement – Soils Section: Docket Nos. CP16-10-000 and CP16-13-000

Dear Federal Energy Regulatory Commission,

IND 837-1

I have been asked by community groups in the Virginia Counties of Giles, Craig, and Montgomery to review the Draft Environmental Impact Statement for the Mountain Valley Project and the associated Equitrans Expansion Project issued in September 2016. I have neither been offered nor did I require a fee for this review. I have attempted to retain a science-grounded approach to the review, and in that light, openly disclose that MVP intends to cross my land and that I am a registered intervenor in the FERC process.

I have practiced Soil Science during my entire academic program (BS, MS, and PhD) and my professional career (36-years and continuing), and was a Certified Soil Scientist in North Carolina prior to moving to Virginia. I am a Fellow of the American Society of Agronomy, former Head of the Department of Crop and Soil Sciences at Virginia Tech, and currently, Professor of Managed Ecosystems and Soil Science, teaching courses designed for both the Environmental Science and Crop and Soil Science degree programs. I make these statements based on my own observations and opinions and emphasize that they do not represent an official opinion of Virginia Tech.

These projects are FERC Docket Nos. CP16-10-000 and CP16-13-000, respectively.

I request that you make these comments part of the record of the proceeding and consider them as part of your decision- making process in determining whether to issue a Certificate of Public Convenience and Necessity for the project.

Respectfully submitted,

Steven C. Hodges, Ph.D.
Soil Scientist

IND837-1 See the comment response to CO109-7 regarding soils.

2016 Mountain Valley Project
FERC Docket No. CP16-10-000

SUMMARY

IND 837-1 cont'd

There is a strong systematic pattern of sloppy work regarding soil limitations as previously found in MVP resource reports, and this pattern continues in the FERC DEIS. First and foremost, repeated calls for on-site evaluations of all soil limitations, particularly on karst landscapes, have been ignored, and only "desktop reviews" have been utilized, as is clearly admitted in the DEIS. Many extremely important factors available by "desktop review" using SSURGO were inexcusably left unused in the FERC environmental analysis. Use of factors such as plasticity index, shrink-swell potential, soil depth, and engineering indices would have greatly improved the ability of FERC to assess soil limitations in an accurate and comprehensive manner. FERC ignored the widely accepted NRCS suitability ratings, also a public, free and internet accessible database available through Web Soil Survey and published soil surveys. Instead, FERC invents its own definitions of soil limitations, and continues the unacceptable practice of treating each of these factors in isolation. The Soil Limitations section of the DEIS clearly does not comply with NEPA (National Environmental Policy Act) regulations to consider the cumulative impacts of multiple interacting limitations, an analysis that is readily accomplished using GIS overlays linked by mapping units within the SSURGO and NRCS suitability databases. This is either incompetence, gross negligence, or refusal to comply with mandates of NEPA guidelines. Numerous examples of flawed methods are highlighted in the discussion below.

IND 837-2

Required Action
The FERC must revise this DEIS and reissue it for public review in a form that is complete and consistent in its presentation, and based on science rather than made-up definitions offered with minimal or no justification. The revised DEIS should make use of widely accepted suitability ratings and engineering indices such as those provided by NRCS in their published soil survey, or use clearly defined, rational and replicable methodologies. The DEIS should not limit its consideration to only sites with severe or very low potentials, rather, the rating for each segment every segment should be recorded in order to facilitate more accurate assessment of interacting factors. The presence of multiple low suitability, severe limitations, and poor potentials should be clearly visualized in map format for public review. This visualization should include both soil and geologic limitations, especially within karst landscapes and areas with any potential for seismic activities, landslides, or and slip-prone soils. Only in this manner will FERC convince the public reviewers that they have taken seriously their mandate under NEPA to consider cumulative impacts. The DEIS should define the meaning of "Temporary" and "Permanent" soil impacts, especially with regard to compaction, in light of science, not the opinions of MVP or the Project Manager. The DEIS should describe how and why, in a scientifically cogent manner, the FERC arrives at conclusions for each segment that multiple and interacting suitability factors and limitations will result in no temporary or permanent impact. The DEIS should explicitly state at what risk level avoidance is recommended, and where such avoidance is not explicitly required, the DEIS should provide detailed and scientifically cogent discussion of the likelihood and required methods of mitigation. Required mitigation practices (not just recommended) must address all soil and geology limitations and constraints that occur rather inadequate factor by factor "suggestions".

IND837-2 We would not re-issue the draft EIS; but this final EIS includes revisions and addresses comments on the draft. Temporary and permanent impacts are defined in section 4 of the EIS.

IND 837-3

Introduction

The FERC DEIS review of "Soils" is found in Section 4.2 and broken into two subunits, entitled 4.2.1 Affected Environment, and 4.2.2 Environmental Consequences. Appendix N provides a set of 10 tables with acres rated severe or poor within each mapping unit segment, for a limited set of FERC- selected and defined soil limitations. Within Section 4.2.1, FERC provides brief summaries and affected areas of Soil Limitations (4.2.1.1), Contaminated Soils (4.2.1.2), Ground Heaving (4.2.1.3), Slip-Prone Soils (4.2.1.4), and Jefferson National Forest (4.2.1.5). These topics are repeated in section 4.2.2 where the emphasis is primarily on what MVP should do to mitigate environmental consequences.

Assessment

IND 837-4

The Soil Limitations section of the DEIS, by its design, grossly underestimates the extent and scope of individual soil limitations. FERC has chosen to define its own unique and highly restricted indicators of soil limitations rather than adopt the widely accepted suitability tables and engineering indices prepared by NRCS. In its execution, FERC merely enumerates, and makes no attempt to assess the magnitude of impact, rather assuming that any limitation is easily eliminated by mitigation. Avoidance is never considered an option, much less discussed. Even more importantly, the DEIS continues to consider each factor in complete isolation when, in fact, most soils through which MVP will pass are known to occur only within landscape positions with multiple limitations. As FERC's Soil Project Leader should clearly understand, but apparently does not, prominent soil series in the right-of-way (i.e. Carbo and Frederick), have been defined by NRCS on-the-ground field surveyors to consistently exhibit key morphological, chemical, and physical features, including a combination of steep slopes, high compaction, high erosion, slip-proneness, high shrink-swell capacity, AND occur within karst landscapes. Add to that shallowness for the Carbo soil (<40 in to hard bedrock), and MVP will need to add blasting damage to the list. Taken one at a time, these limitations are perhaps mitigatable if MVP is required to cease all construction activities when soils are moist. Taken in total, these soil limitations present extreme conditions for construction engineers and land managers who must deal with the impact of disturbance on them long after construction is done. Since FERC has relied on a GIS based SSURGO database, they could easily have overlaid data layers to assess multiple factors for each milepost segment listed in Tables N1 to N10. In the Environmental Consequences section, FERC again makes no assessment of environmental consequences, nor do they consider or recommend avoidance. Rather, the DEIS sticks to recommending "industry standard" mitigation practices on a factor by factor basis, failing to recognize the fixes for one often exacerbates another.

IND 837-5

IND 837-6

The entire "Soils" section of the DEIS is very poorly done and does not present an accurate picture of the soil limitations faced by MVP. It is totally inadequate in its design scope and in its execution. In this case, lack of credible, public, and free desktop review databases is not a viable excuse, rather it is a result of failure to use the readily available data in a professional and competent manner.

IND837-3 See the response to comment CO109-8 regarding soils.

IND837-4 See the response to comment CO109-9 regarding soils.

IND837-5 See the response to comment CO109-10 regarding soils.

IND837-6 See the response to comment CO109-11 regarding soils.

Supporting Documentation

IND 837-7

1. **Inadequate site specific data for assessing soil limitation, hazards, and site specific methods for mitigation**.

To state the obvious, relying solely on NRCS SSURGO data for assessing site specific soil limitations is inadequate. The smallest area typically shown on a soil survey map is on the order of 1-4 acres, so inclusions of other soils, including those with more severe limitations, within a soil mapping unit are unavoidable. NRCS clearly states on their website and in their published soil surveys that the intended purpose of their soil surveys is to aid landscape-scale planning. For this reason, NRCS strongly discourages use of soil survey data and maps for intensive development projects, for example a 42-inch diameter high pressure pipeline, access roads, and associated facilities. We are not aware of any on-site soil evaluations conducted by MVP to assess the full range of potential soil limitations, with the exception of corrosion assessment in limited areas. The level of detail and scope of soil maps are simply inadequate to provide an accurate assessment of soil limitations and the environmental consequences of the project's impact on soil and water resources, and future pipeline integrity.

IND 837-8

That said, the extremely limited and highly selected SSURGO data provided by the DEIS is adequate proof that large sections of this pipeline, at least in Virginia, are ill-advised based on co-location of multiple soil and landscape limitations, including karst.

IND 837-9

2. Shoddy Work

In the "Affected Environment" subsection, slip-prone soils are described in section 4.2.1.4. This section describes only one soil series and 56 acres of affected land found only in West Virginia. Apparently slip-prone soils are not a problem in Virginia? There is no consideration of Virginia land area, nor are the affected soil series described. This a bewildering omission, since if one is curious about the consequences of this very limited impact, and turns to section 4.2.2.4, very different numbers, are reported, including those for Virginia. This inconsistency is problematic and seems an attempt to disguise the actual area of slip-prone soils. Even more importantly, FERC does not divulge its method for deriving "slip-proneness", a consistent pattern to be discussed in detail below. SSURGO does not rate "slip proneness". Rather it provides a range of ratings for "slip potential". Any soil with a rating above low should raise a red flag for construction engineers, especially if those soils are located on steep slopes, as many are. I will also note, that this very important rating is not included in the data tables (4.2.1-1 and 4.2.1-2) enumerating the (partial) impacts of MVPs planned construction project. The Tables in Appendix N, likewise show the same shoddy work. Totals are supposed to be enumerated in Tables N-1 to N-10. Tables N-1 and N-2 are extremely important, in that they show the FERC-selected and defined soil limitations by milepost segments, thus allowing assessment of the continuity and co-location of limitations along the route. However, only Table N-1 contains totals. Tables N-2 to N-10 provide no totals, even though the footnotes indicate totals should be included.

IND 837-10

IND 837-11

IND 837-12

As it turns out, this has much bearing on the conclusions reached. The DEIS describes some rather extreme "mitigation" measures for sites with Landslide potential (Section 4.2.1.4 Slopes and Landslide Potential, p. 4-46). They indicate the same measures will be required for slip-prone soils. These are not "temporary" measures. Yet they somehow conclude that essentially

IND837-7 See the response to comment CO109-12 regarding soils.

IND837-8 See the response to comment CO109-13 regarding soils.

IND837-9 See the response to comment CO109-14 regarding soils.

IND837-10 See the response to comment CO109-15 regarding soils.

IND837-11 See the response to comment CO109-16 regarding soils.

IND837-12 See the response to comment CO109-17 regarding soils.

IND 837-12 cont'd

all damage inflicted by MVP, except for land occupied by buildings and permanent access roads, will be "temporary." In fact, because of frequency and continuity of slip-prone soils found on steep slopes along the proposed route throughout Giles County, construction will be very disruptive and will inflict levels of damage unlikely to be mitigated by even the best efforts of MVP.

IND 837-13

3. Failure to accurately Define "permanent" and "temporary" damage by MVP

We can find no definition of "permanent" and "temporary" impacts. A reputable soil scientist could never support the FERC conclusion, that sites experiencing this degree of disturbance, having multiple soil limitations, including high slip potential, high shrink-swell, steep slopes, and karst would emerge from massive disturbance with only temporary, and readily mitigatable impacts.

Many of the very same activities proposed by MVP and deemed "temporary" by FERC's DEIS in fact persist for 75 years or more after reclamation, as reported by scientists in Pennsylvania (Fink and Drohan, 2014). So, must we assume "TEMP" is less than 75 years and "PERM" is more than 75 years? (Ref. Cody M. Fink, C.M. and Drohan, P.J. 2014. Soil Sci. Soc. Am. J. 79:146–154)

Virginia Tech Professor W. Lee Daniels, a renowned soil expert on reclamation of drastically disturbed soils and landscapes, has also disputed DEIS claims of temporary impacts during construction and fill activities. The following quote appeared in an article in *The Roanoke Times* by Duncan Adams, entitled "A question of effect: Pipelines vs. mortgages, property values, insurance", on April 3, 2016.

> Lee Daniels, a professor of environmental soil science at Virginia Tech, said a combination of deep disturbance of soils and deep soil compaction of replacement soil materials, if both occur during pipeline construction, "would and could limit crop production for decades, if not hundreds of years."

IND 837-14

4. Omission of key taxonomic classes in describing soil series.

Failure to provide standard soil taxonomic names (despite repeated requests in comments to FERC) is unacceptable. These classes, such as "Fluvaquents" clearly communicate key soil attributes to knowledgeable reviewers who may not be familiar with a particular soil series, which is very likely considering the large number of soil series through which MVP will pass. Appendix N identifies mapping units at each milepost interval, but provides no taxonomic clues as to soil formative conditions at each site. At the very least, the limiting class feature should be provided. This is essential in order for reviewers to verify the validity and credibility of the data reported by MVP, and parroted by the FERC.

IND 837-15

5. DEIS Design and Definitions Result in Gross Underestimation of Actual Soil Limitations

The DEIS is highly selective in choosing both soil limitation criteria and in defining which data and rankings will be used in assigning "severe" limitation or "low" potential.

IND837-13 See the response to comment CO109-18 regarding soils.

IND837-14 See the response to comment CO109-19 regarding soils.

IND837-15 See the response to comment CO109-20 regarding soils.

IND 837-15 cont'd

Extremely Limited Assessment Criteria

All Tables in Section 4.2.2.1 Soil Limitations and in Appendix N (Tables N-1 to N-10) should have provided additional soil limiting factors and the totals for extent (acres) with each limitation. The missing factors include soils with: 1) plasticity index greater than 30, 2) low liquid limits, 3) depth to bedrock, and 4) slip potential (greater than "Low"). Engineers reviewing the document now, and those who will be charged with inspecting and maintaining the many miles of very poor and unsuitable sites certainly would appreciate Table showing the AASHTO and Unified engineering indices as well, especially for soils such as Carbo and Frederick which have the lowest rating possible in these indices. They are, to say the very least, difficult when dry, very messy when moist, and impossible for days after a good rain, if they have not eroded away or been previously compacted and made impervious by construction activities.

IND 837-16

To exclude these extremely relevant and SSURGO-supplied soil limitation factors effectively limits the credibility and usefulness of this entire assessment. Clearly MVP and the FERC have provided a partial, deficient, and completely inadequate assessment that reveals only the information they wish to disclose to the public. This is compounded by the fact that MVP has long refused requests for pipeline centerline shapefiles for geospatial analysis by public-minded analysts, and further by the FERC's use of undefined and non-standard soil limitation criterial and rankings (discussed below). NRCS published soil surveys of each county, available as pdfs or on web soil survey (with downloadable data) provide widely accepted and highly relevant soil limitation interpretations.

IND 837-17

The data that is provided is scattered throughout the document in ways that prevent a holistic analysis of the compound impacts. In its discussion of landslides within the Geology section, for example, FERC does not use SSURGO slip potential in its assessment and concludes only 72.6 miles of the pipeline impact area is subject to "landslides". Yet we see 290 acres of soils are slip-prone in Virginia. So, which is right? Or are both correct, and yet again the DEIS fails to assess cumulative impacts? We are told by the DEIS there will be limited and "temporary" impact on compaction, rutting, landslides and slip potential, erosion during and after construction, slope and spoil instability but, in reality, are left wondering how FERC could draw such a conclusion based on these limited data sets and an utter failure to consider co-located limitations.

IND 837-18

Lack of Definitions/Methods, or Use of Questionable Choices

Unlike the landslide Incidence Assessment (4.1.1-10, page 4-30), which offers a more complete picture of incidence and potential with low, moderate and high ratings, this entire section enumerates only soil areas receiving FERC-defined ratings of "severe" or "poor". In truth, the only methods or definitions the DEIS provides for these ratings are in the footnotes of Tables 4.2.1-1. and 4.2.1-2 (and Appendix N). As a soil scientist, I find several of these to be primitive and inadequate measures of the true damage that will be inflicted by the MVP construction and maintenance activities and their impact on permanent modifications to soil hydrology and soil cohesiveness. These are extremely critical factors in karst landscapes where such activities increase the likelihood of soil raveling and collapse sinks. As previously discussed, FERC has not chosen to enlighten us with their definition of TEMP" and "PERM".

IND837-16 See the response to comment CO109-21 regarding soils.

IND837-17 See the response to comment CO109-22 regarding soils.

IND837-18 See the response to comment CO109-23 regarding soils.

IND 837-19

The FERC's "definitions" with comments are listed below using the label and order from Tables 4.2.1-1, page 4-56. (differs from Appendix N).

a. Areas identified as **highly water erodible** soils are ranked as "very severe" or "severe" by SSURGO erosion hazard (Off-Road, Off-Trail) criteria.
[COMMENT: Is this criterion (off road/off trail) really applicable to construction sites? Of course, not! If they are this bad on undisturbed, off-road sites, one can only imagine what they would be like under road construction and shallow excavation conditions. A terrible choice of a ranking criteria that grossly underestimates erosion potential, one of the most dangerous threats to water quality in the region. Water erosion is a complicated factor that includes erosivity, cover, local climate, and management features. This factor assumes a forest cover and minimal traffic, a condition which MVP will not tolerate in its right of way.]

IND 837-20

b. Areas identified as **highly wind erodible** soils have a wind erodibility index of 1 or 2 as determined by SSURGO.
[COMMENT: No real problem here, since we have little wind erosion potential if they CAN be revegetated, the unspoken assumption.]

IND 837-21

c. Areas identified as **prime farmland** are identified as lands that meet the "all prime farmland" or "farmland of statewide and local importance" criteria as determined by NRCS, SSURGO.
[COMMENT: These are well defined by NRCS, so no problem.]

IND 837-22

d. Areas identified to have a **hydric rating** include the "all" and "partial" criteria as determined by SSURGO.
[COMMENT: Adequate: wetlands are dealt with elsewhere and have additional criteria.]

IND 837-23

e. Areas identified to have a **severe compaction potential** are **limited** to silt loam or finer based on particle size and ranked "somewhat poor," "poor," and "very poor" drainage as determined by SSURGO.
[COMMENT: Again, an extremely limited and restrictive definition for soils that could suffer severe compaction. The DEIS definition used in this table to define extent of damage is woefully inadequate. As the DEIS itself describes in the narrative:
- page 4-60:
"Compaction is typically of concern when the moisture content of the soils is high such as in hydric soils **or during precipitation events**"; **(one must assume then no construction will take place until soils are completely "dry"?), and**
- page 4-66:
"soils with moderate moisture content would typically be more prone to compaction associated with construction than dry soils."

The DEIS (page 4-60) blindly goes on to use estimates that grossly underestimate the real extent of soil compaction potential based on a definition that in no way agrees

IND837-19 See the response to comment CO109-24 regarding soils.

IND837-20 See the response to comment CO109-25 regarding soils.

IND837-21 See the response to comment CO109-26 regarding soils.

IND837-22 See the response to comment CO109-27 regarding soils.

IND837-23 See the response to comment CO109-28 regarding soils.

IND 837-23 cont'd

with these more honest statements. The compaction factor is so important and so grossly underestimated that more discussion is included below.]

IND 837-24

f. Areas identified to have **stony/rocky soils** are soils that as determined by SSURGO include stone, rocky or cobbles in the soil name (does not include rock outcrops).

[COMMENT: The DEIS considers the impact of this factor on revegetation potential (but says most will be removed) but does not consider this factor or rock removal impacts on compaction potential during trench filling, and erosion potential during disturbance.

The real question: why was soil depth not included? How many acres of soils with depth less than the depth of the excavation trench will be drastically altered by this construction? This is readily available in SSURGO. Some of MVPs favorite targeted soils with less than 40 inches to hard bedrock in Giles County include Carbo, Faywood, Lily, Bailegap, and Poplimento.]

IND 837-25

g. Areas identified to have **poor revegetation potential** are lands that have a Capability Class 3 or greater, a low available water capacity, and slopes greater than 8 percent as determined by SSURGO.

[COMMENT: Class 3 and slopes >8 are certainly appropriate. But the decision to consider only soils/sites with "low" available water is somewhat baffling. This decision is nowhere explained or justified. It seems an attempt to simply limit "poor" ratings to selected sites. Clearly factors other than soil series per se will determine revegetation success as well: aspect (direction that slope faces), degree of compaction, drainage, choice of species, and other induced changes resulting from disturbance and reshaping. The low available water essentially limits this group to nearly pure sands or bedrock, since MVP claims they will remove stones from "stony" soils they disturb.]

IND 837-26

h. Areas identified to have **poor drainage potential** are ranked as "poor" or "very poor" as determined by SSURGO.

[COMMENT: This definition again underestimates potential soil limitations depending on the season in which construction takes place. Somewhat poorly drained soils should be included. By definition, these soils frequently exhibit limitations to agricultural activities, particularly in the spring of the year, and artificial drainage is recommended for agriculture or development activities.]

IND 837-27

6. The operational definition of "compaction potential" of soils is woefully inaccurate and inadequate.

Compaction contributes to poor drainage, runoff, erosion, sedimentation of streams, slope creep, and landslides. As noted above the DEIS defines severely compactable soils solely (and misleadingly) as silt loams or finer textured soils AND poorly drained sites. This is simply incorrect. This is an extremely limited definition for compactable soils. The more important variable, plasticity index, is excluded by definition. As a consequence, Appendix N-1 (WVA)

IND837-24 See the response to comment CO109-29 regarding soils.

IND837-25 See the response to comment CO109-30 regarding soils.

IND837-26 See the response to comment CO109-31 regarding soils.

IND837-27 See the response to comment CO109-32 regarding soils.

IND 837-27 cont'd

arrives at the fallacious observation that only the 7.5 miles of the MVP area crossed in all of WVA has a "severe" compaction potential (Totals shown on page N1-279).

As noted above, even the DEIS narrative disagrees with this definition. Compaction is a function of the degree of pressure placed on the soil, and the amount of moisture present in the soil at the time such pressure is applied. Unless MVP wants to specify soil moisture contents at which it will not perform construction activities, compaction potential is high for essentially all soils through which the MVP will cross (very few dry sands).

A better indicator would consider the publicly available published soil survey Suitability Tables 10-15. These are available as pdfs from the NRCS website, or as interpreted digital maps, or data downloads via Web Soil Survey. These tables include highly relevant suitability ratings, with justifications for the ratings, by mapping unit for uses such as shallow excavation, local roads, building site development and many other activities similar to those MVP intends to use.

The Kastnings report, which FERC has totally ignored in this DEIS, provided for the FERC just such a compilation. I am utterly astounded that FERC would not use the widely accepted and readily available NRCS indicators with clear interpretations of soil limitations.

IND 837-28

7. Impacts of trenching, construction, trench drainage, waterproofing, and erosion control structures will have serious effects on future land uses, soil hydrology and potential karst development.

These impacts are simply not considered or addressed by the DEIS. Mitigation plans are not fully revealed, but those that are provided include significant land-use altering erosion control structures, trench drainage, or use of bentonite barriers to limit entry corrosive waters into the trench. There is no effort to identify where these measures will be required, their extent, or to assess the potential impacts. Again, the Carbo and Frederick soils are strong candidates, especially on the long lateral slopes through which the pipeline will pass, at least in southern Giles County, including the Historic Districts of Newport and surroundings. Will these measures induce water accumulation above the pipeline? Will they discharge excess water on slopes below the pipeline inducing soil slippage? Or will they simply increase water flow near the trench into the underlying karst? MVP did no on-site assessments, and has done no karst alignment studies to show where cover or collapse sinks may develop. FERC has no clue and gives no guidance.

IND 837-29

8. The DEIS considers each factor in isolation rather than considering overlapping, collocated limitations in reach its conclusions.

FERC does not consider the presence of multiple factors in landscapes along the route. This is somewhat like looking at each individual piece of a magnificent stained-glass window and concluding that a there will be no impact from breaking it into pieces and melting it down to make new beer bottles, since the individual pieces are "just glass". The DEIS must be revised to include the common and readily accomplished technique in overlaying GIS data layers to analyze compound limitations and hazards. This should include all soil limitations, land-slide potential, slope limitations, and, as applicable, karst. This would readily identify areas with many overlapping hazards and facilitate visualization at any given location. MVP and the FERC

IND837-28 See the response to comment CO109-33 regarding soils.

IND837-29 See the response to comment CO109-34 regarding soils.

IND 837-29 cont'd

have both resisted this vital step in hazard assessment. Simply put, there can be no credible claim that NEPA requirements for a cumulative impact assessment have been conducted without providing this information.

Consider for example, the entire extent of the pipeline route along the north-facing landscape of Sinking Creek mountain from the Newport Historic District to the pipeline exit into Montgomery County. The Jefferson National Forest lies immediately adjacent to this landscape on the south face of the mountain. Both Carbo and Frederick soils are common to dominant, except where shallow, rocky soils and exposed bedrock occur. Thus, this landscape, in particular the portions where the centerline has been routed, include a predominance of segments that would be labeled with the following limitations:

- steeply sloping soils
- "slip-prone" soils
- erodible soils
- compactable soils
- moderate to high corrosivity to uncoated steel (Carbo)
- shallow depth to bedrock (Carbo, Poplimento)
- areas of exposed bedrock requiring blasting
- karst surface features and landscapes, including disappearing streams
- sinkholes within the right of way, and many more within 0.25 mi
- a major cave (Canoe cave), and many small caves
- lies within the Giles County Seismic Zone
- exhibits a cluster area of many previous land-slides
- includes the Newport National Historic Districts
- includes area deemed a Cultural Landscape by MVP Environmental Anthropology consultants.

The FERC DEIS has deemed each one of these of no concern, but clearly has failed to consider the cumulative impacts on this sensitive environmental and cultural landscape.

This lack of development and dominance of agriculture use has been the primary excuse offered for MVP for targeting this landscape. The fact is, there are clear and present reasons that development has not come to Newport and it surrounding communities, even though it lies within easy reach of Blacksburg. This is a very fragile landscape with multiple severe limitations that knowledgeable developers have intelligently avoided.

Conclusions

IND 837-30

The DEIS grossly underestimates the extent of soil limitations while overestimating MVP's ability to mitigate them, especially when multiple limitations are co-located. It does this by providing a very biased set of indicators, and then defining those indicators in such a way as to minimize the impacts on soil quality and water quality, and threats to the integrity of the pipeline.

IND 837-31

The DEIS considers each factor in isolation in reaching its conclusions. FERC does not consider the presence of multiple factors in landscapes along the route.

IND837-30 See the response to comment CO109-35 regarding soils.

IND837-31 See the response to comment CO109-36 regarding soils

IND 837-32 FERC has totally ignored the Kastnings report, which clearly specified for them the most hazardous soils in Giles County using widely accepted, free, and publically available data from NRCS. From a scientific perspective, this section is indefensible. Considering the demands of NEPA for a professional, competent and unbiased EIS, this entire Soils section is a woefully deficient and should be rejected in total.

Required Action

IND 837-33 The FERC must revise this DEIS and reissue it for public review in a form that is complete and consistent in its presentation, and based on science rather than made-up definitions offered with minimal or no justification. The revised DEIS should make use of widely accepted suitability ratings and engineering indices such as those provided by NRCS in their published soil survey, or use clearly defined, rational and replicable methodologies. The DEIS should not limit its consideration to only sites with severe or very low potentials, rather, the rating for each segment every segment should be recorded in order to facilitate more accurate assessment of interacting factors. The presence of multiple low suitability, severe limitations, and poor potentials should be clearly visualized in map format for public review. This visualization should include both soil and geologic limitations, especially within karst landscapes and areas with any potential for seismic activities, landslides, or and slip-prone soils. Only in this manner will FERC convince the public reviewers that they have taken seriously their mandate under NEPA to consider cumulative impacts. The DEIS should define the meaning of "Temporary" and "Permanent" soil impacts, especially with regard to compaction, in light of science, not the opinions of MVP or the Project Manager. The DEIS should describe how and why, in a scientifically cogent manner, the FERC arrives at conclusions for each segment that multiple and interacting suitability factors and limitations will result in no temporary or permanent impact. The DEIS should explicitly state at what risk level avoidance is recommended, and where such avoidance is not explicitly required, the DEIS should provide detailed and scientifically cogent discussion of the likelihood and required methods of mitigation. Required mitigation practices (not just recommended) must address all soil and geology limitations and constraints that occur rather inadequate factor by factor "suggestions".

IND837-32 See the comment response to CO109-37 regarding soils.

IND837-33 Comments noted. Temporary and permanent impacts are defined in section 4 of the EIS.

INDIVIDUALS
IND838 – Tina Smusz

December 21, 2016

Ms. Kimberly Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Joby Timm, Supervisor and Jennifer Adams, special project coordinator
George Washington and Jefferson National Forests
5162 Valleypointe Parkway
Roanoke, VA 24019

Re: Mountain Valley Pipeline proposal, Docket No. CP 16-10 – letter from intervenor addressing negative impacts to public water quality and craft brewery industry

Ms. Bose and Members of the Commission, and Forest Service staff,

IND 838-1

Spring Hollow Reservoir is being touted as a key component facilitating the Roanoke Region's burgeoning craft brewery industry. The December 20, 2016 Roanoke Times editorial – "Advice for Anyone Thinking About Running for Local Office" highlights the importance of both long term planning decisions made by local governments, and the expected role of this particular reservoir as a backup water source for industries using Carvins Cove water (http://www.roanoke.com/opinion/editorials/editorial-advice-for-anyone-thinking-about-running-for-local-office/article_fb016b50-4aa6-592c-b993-a7163a8e8077.html#facebook-comments). Sadly, Spring Hollow Reservoir's water quality is already a source of concern to the Western Virginia Water Authority (see below) and now would be severely jeopardized by the Mountain Valley Pipeline project. Details of Mountain Valley Pipeline threats to Spring Hollow Reservoir water quality and the region's growing craft brewery movement are contained in my letter submitted to the FERC docket CP16-10-000 on 12/19/2016 (FERC submission 20161219-5212(31845109).

The December 20, 2016, Roanoke Times editorial emphasizes the important role of local, long-term planning. The example cited is the 1986 decision of Roanoke County to build the Spring Hollow Reservoir; a decision portrayed as critical to meeting present day water needs of Deschutes Brewery:

> *"The county's decision to build Spring Hollow expanded the Roanoke Valley's water supply — which, in turn, enabled the city and county to form the Western Virginia Water Authority in 2004 and combine their water systems. One pleasant side-effect of that decision: We now have a water and sewer system with a lot of capacity, which checked off a big box for any brewery looking at the region."*

The editorial goes on to describe Botetourt County's 2015 decision to join Western Virginia Water Authority as key in that area's acquisition of Ballast Point Brewery for the Greenfield Center in Botetourt

IND838-1 See the response to comment CO49-63 regarding the Spring Hollow Reservoir. Herbicide use would be limited and would be in accordance with manufacturer's recommendations. See the response to comment IND277-11 regarding chemicals. Water resources and karst are addressed in sections 4.3 and 4.1, respectively. See the response to comment IND70-1 regarding erosion. A revised discussion of sedimentation and turbidity can be found in section 4.3 of the final EIS. See also the response to comment FA11-15 regarding sediment and turbidity modeling.

IND 838-1 cont'd

County – *"Previous breweries had passed on Greenfield because it only had well water. Now, it's pumping in water from Carvins Cove, with Spring Hollow as a backup."* (Underlining is mine)

The following worrisome information about Spring Hollow Reservoir's current water supply is directly from the Western Virginia Water Authority 2016 water quality report page 8 https://www.westernvawater.org/home/showdocument?id=2456. (Emphases in **bold** are mine)

> *"The VDH also completed a source water assessment of **Spring Hollow Reservoir's water source, the Roanoke River.** This assessment determined that the **Roanoke River may be susceptible to contamination because it is surface water exposed to a wide array of contaminants at varying concentrations**. Also, changing hydrologic, hydraulic and atmospheric conditions promote migration of contaminants **from land use activities of concern** into the Roanoke River.*
>
> *The assessment also determined that the Water Authority's wells might be susceptible to contamination because they are located in areas that promote migration of contaminants from land use activities of concern."*

"Land use activities of concern" would most certainly include Mountain Valley Pipeline construction and operation activities which include numerous crossings of the biggest tributaries of the Roanoke River (the North Fork and South Forks of the Roanoke River) including the huge 84' wide crossing of the North Fork of the Roanoke River just 2 miles from the Spring Hollow intake pump station. The proposed pipeline route passes just 0.8 miles west of the Spring Hollow Reservoir, through an area of karst bedrock which facilitates communication between water bodies throughout the Roanoke River watershed.

Roanoke Area source water contaminants can include the following (from the same WVWA report, pg 8; **Bolding** is mine):

- ***Microbial contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife;*
- *Inorganic contaminants, such as **salts and metals**, which can be naturally-occurring or result from urban stormwater runoff, **industrial or domestic wastewater discharges**, **oil and gas production**, mining, or farming;*
- *Pesticides and **herbicides**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;*
- *Organic chemical contaminants, including **synthetic and volatile organic chemicals,** which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems; and*
- ***Radioactive contaminants**, which can be naturally-occurring or be the result of oil and gas production and mining activities.*

IND 838-1 cont'd

https://www.westernvawater.org/drinking-water/water-sources-and-treatment/water-quality-reports

Highlighted sources of potential contamination to the Roanoke River in the above publication signify the multiple threats posed by the Mountain Valley Pipeline – microbial contaminants would be increased due to excavation which denudes ground surface allowing for increased runoff from livestock operations and wildlife; waste water quantities from pipeline construction are enormous as water is flushed through the pipe to test welds – this could contain salts and metal contaminants; MVP filed a new "Herbicide Use Plan" (CP16-10-000, Accession No. 20161216-5171) 5 days ago which specifies using herbicides to control invasive plants in the 3.4 mile corridor of the US Forest Service crossed by the pipeline, forest which is in the Roanoke River Watershed. Most worrisome is the possibility that much of this stretch could be 500' wide if the USFS approves Amendment #1 of their Land and Resource Management Plan. Finally, operation (and future abandonment) of the pipeline exposes the Roanoke River/Spring Hollow Reservoir water to synthetic and potentially volatile chemicals, and radioactive contaminants via depositions of Black Sludge and radioactive byproducts of radon contained in natural gas (see FERC submission 20161219-5212(31845109).

The following is from FERC/DEIS-DO272, Mountain Valley and Equitrans Expansion Project: Draft Environmental Statement, September 2016. *Cumulative Impacts* 4-499 illustrates just how large a role waste water plays in gas pipeline construction and operation (**bolding** is mine):

> *"In Virginia, general permit VAG83 governs the discharge of wastewaters from sites contaminated by petroleum products, chlorinated hydrocarbon solvents,* ***the hydrostatic testing of*** *petroleum and* ***natural gas storage tanks and pipelines,*** *and the hydrostatic testing of water storage tanks and pipelines. These wastewaters may be discharged from the following activities: excavation dewatering, conducting aquifer tests to characterize site conditions,* ***pumping contaminated groundwater to remove free product from the ground,*** *discharges resulting from another petroleum product or chlorinated hydrocarbon solvent cleanup activity approved by the board, hydrostatic tests of natural gas and petroleum storage tanks or pipelines, hydrostatic tests of underground and aboveground storage tanks, and hydrostatic tests of water storage tanks and pipelines.*
>
> *The VDEQ requires permits related to surface water and groundwater withdrawals and discharges including the Virginia Water Protection General Permit Number WP2 for facilities and activities of utilities regulated by the Commonwealth Corporation Commission. The permit program governs permanent and temporary impacts related to the construction and maintenance of utility lines."*

Mountain Valley Pipeline grossly minimizes its impacts on groundwater throughout the Roanoke River Watershed (mile posts 220 – 237) with the following statements:

> *"The MVP pipeline route would cross considerable karst terrain between about MPs 190 to 237. Mountain Valley has developed a Karst Mitigation Plan to reduce the impacts on karst terrain (see discussion in section 4.1.2). In consideration of available information for other projects, and the protective measures*

IND 838-1 cont'd

proposed by MVP, ***we have not identified any cumulative impacts on karst terrain that would result from construction and operation of the projects. Given the nature of shallow pipeline trenching relative to deeper aquifers, Mountain Valley's Karst Mitigation Plan, as well as the protective permitting requirements of other agencies for other projects such as oil and gas well development, we conclude that the combined cumulative effects upon groundwater would be less than significant.*** "(FERC/DEIS-DO272, 4-501 Cumulative Impacts)

The WVWA considers surface water to be the main source of water in the Roanoke River describing it as follows: *"it is surface water exposed to a wide array of contaminants at varying concentrations"* (pg 8 from the WVWA Quality Report). The proposed MVP would cross 361 perennially flowing water bodies throughout its entire route through West Virginia and Virginia. Impacts on surface water sources are minimized by FERC in the following quote from FERC/DEIS DO272, 4-502 Cumulative Impacts (bolding and underlining are mine):

"Construction of the projects would result in temporary or short-term impacts on surface water resources (see section 4.3.3), as well as some ***minor long-term impacts such as loss of forested cover in the watershed and partial loss of riparian vegetation. These impacts, such as increased turbidity levels, are expected to return to baseline levels over a period of days or weeks*** *following construction given the Applicants commitments to restore the waterbodies according to their specifications, which are based on the FERC Procedures."*

The PreserveCraig.org letter (Erosion and Sedimentation Issues – accession number 20161221-5353) submitted 12/20/16 to FERC Docket CP16-10-000, goes into great detail regarding "sedimentation" of waterways which is acknowledged to be a statewide and nationwide problem. The DEIS does not address this critical component of water contamination along the proposed MVP path. In fact, it only references temporary "increased turbidity levels" which they expect to last only "days to weeks". PreserveCraig.org notes the following on page 3 of the letter:

"Sedimentation is the most commonly occurring environmental impact from pipeline construction, and an EIS must define and require proven, workable techniques for effectively controlling erosion and runoff on the steep slopes of the proposed route. The DEIS neither adequately addresses the limitations of mitigation strategies nor does it propose solutions to known mitigation failures.

EPA assessments have demonstrated that sediment accumulation is among the most common stressors in streams Nationwide (EPA 2013), and is estimated to negatively affect nearly half of the river-miles in Virginia (VDEQ 2013)."

All of the above information regarding water contamination by the Mountain Valley Pipeline highlights the wisest statement in the Roanoke Times editorial:

"Sometimes it's hard for politicians (or voters, too, for that matter) to look past the next election. But we're really asking them to make decisions for the next generation."

IND 838-1 cont'd

Protecting the Roanoke region's water supply and the economic development which is dependent upon it is a decision which we must live with long into the future. The Mountain Valley Pipeline does not promise lasting jobs or improved health for our region – it promises the antithesis. Deschutes Brewery alone promises at least 100 local jobs when it is in operation. Nor will the MVP enhance our breath-taking vistas and tranquil pastoral scenes which underpin our huge tourist trade – it promises to defile them. Craft breweries and their customers (including numerous retail stores offering their brews) can rightfully claim that having fun, socializing with community members, and relaxing after a productive day of work or hiking the Appalachian Trail are worthwhile activities which simultaneously improve our local economy.

The editorial that prompted this letter ends with the following advice which applies to all of us citizens involved in local politics:

> *"So to all you potential candidates out there: Run on whatever local issues you think are important now. But what's really important is that you understand how modern regional economies work, and how they're likely to work in the future. There'll be a test — except it won't come next election day. It'll come decades from now, when another generation looks back to see whether you got it right. No pressure."*

Respectfully,

Tina Smusz, MD, MPH
Catawba, Virginia

Back off.

IND 839-1 National Geographic declared most of the area MVP wants to use as a "unique Ecoregion", in the December 2016 magazine. So, stop looking at this area to use. FERC and FS need to declare the MVP routes unsuitable for the proposed land use by taking the "No Action" Alternative.

Thank you, Reviewer, for including this Citizen's comments to the pool of information that FERC will use to determine the "No Action" Alternative for MVP. National Geographic to the rescue of unique habitats.

IND839-1 Ecoregions are discussed in section 4.4 of the EIS. The statements regarding the No Action Alternative are noted.

INDIVIDUALS

IND840 – Linda Sutton

20161222-5257 FERC PDF (Unofficial) 12/22/2016 1:44:50 PM

Linda Sutton, Roanoke, VA.
December 22, 2016
Re: Docket #CP16-10-000
Harmful impacts from/rejection of the EQT/NextEra Mountain Valley Pipeline in Virginia
To: Chairman Cheryl A. LaFleur
Federal Energy Regulatory Commission

IND 840-1 An overwhelming amount of scientific, environmental data and evaluations published and submitted to the Federal Energy Regulatory Commission unquestionably indicates that irrevocable, adverse impacts are very likely to occur from construction and implementation of the proposed pipeline. Vital water, soil, and air resources, in addition to wildlife and forests on both public lands (managed by the National Forest Service and the National Park Service) and private lands would be permanently harmed.
Please include in the Final Environmental Impact Statement an objective and logical review of this evidence, as well as the lack of credible evidence for a real economic need for the pipeline, and reject the proposed project.
Big energy companies (the only ones who will really profit from this project) probably think they can afford the risks and inevitable costs of lawsuits, compensation, and remediation for environmental damages. However, no amount of money would ever be able to fully restore or reverse the contamination and destruction of natural resources and lives of the thousands of people who will be negatively affected by the proposed pipeline.
Sincerely,
Linda Sutton
Roanoke, Virginia

IND840-1

We conclude that with mitigation, the project is not likely to have significant impacts on most environmental resources (except the clearing of forest). The EIS provides an assessment of water resources in section 4.3, soils, in section 4.2, wildlife in section 4.5, forests in section 4.4, and air quality in section 4.12.1. See the response to comment FA11-12 regarding need.

INDIVIDUALS

IND841 – Lauren Bradford

20161222-5267 FERC PDF (Unofficial) 12/22/2016 1:49:49 PM

IND 841-1

Lauren Bradford, Chesapeake, VA.
The pipeline's construction would mare the landscape forever and its potentially to permanently destroy the wilderness is why I strongly oppose the application for a Special Use Permit to cross the Jefferson National Forest and the requests for amendments to the Forest Plan. I believe the Bureau of Land Management (BLM) and the Forest Service must reject these proposals and I urge you to do so. The use is not "special," its use is for crony capitalism; nothing special about that concept! What is special? The unique ecosystem that stands in the forest now, undisturbed as it should remain.

IND841-1 Impacts on visual resources are discussed in section 4.8 of the EIS. The MVP route would not crossed any designated Wilderness areas. Comments noted. See the response to comments FA8-1 and FA10-1 regarding the LRMP. We conclude that with mitigation, the project is not likely to have significant impacts on most environmental resources. The right-of-way would be restored and revegetated following construction (see section 2.4.2 of the EIS).

INDIVIDUALS

IND842 – William Sydor

20161222-5274 FERC PDF (Unofficial) 12/22/2016 11:39:46 AM

Submission Description: (doc-less) Motion to Intervene of William J. Sydor under CP16-10-000.

Submission Date: 12/22/2016 11:39:46 AM

Filed Date: 12/22/2016 11:39:46 AM

Dockets

CP16-10-000 Application for Certificate of Public Convenience and Necessity and Related Authorizations.

Filing Party/Contacts:

Filing Party Other Contact (Principal)	Signer (Representative)
Individual	William.J.Sydor@vt.edu

Basis for Intervening:
CP16-10-000

IND 842-1 I am writing with regard to concerns about the Mountain Valley Pipeline, hereafter referenced as MVP. The mitigation measures described in the Draft Environmental Impact Statement demonstrate a lack of full understanding of the environmental issues associated with the disturbance of forested areas in rugged mountain topography in a temperate climate with periodic heavy rains. Soil erosion will occur when forests are cut limiting the ability to establish a new vegetation cover on the remaining slopes despite efforts of decompaction and fertilization. Runoff will carry sediments into streams directly impacting water quality and aquatic life.

IND 842-2 The mitigation measures proposed in the DEIS for invasive species documents how MVP plans to monitor their equipment to prevent their introduction of invasive species, but fails to understand the natural dispersal of invasive species via wind, birds, and other animals. Invasive species are of concern as they are easily able to colonize disturbed sites and displace native species. Most invasive species are poorly utilized as food resources by insects and upon which many bird species depend for feeding their young and the presence of non-native species will have an indirect impact upon them and other insect feeding species. The plan to monitor and selectively remove invasive species for a period of two years is inadequate as any open areas on the site will be occupied by new invaders and any that are missed will grow and increase in number. From personal experience I have found it very difficult to control invasive species in the limited area of my own yard despite intense efforts.

IND 842-3 The restoration plan underestimates the difficulty of reestablishing native species which do not thrive as readily as invasive species, especially on sites with disturbed soils.

IND842-1 Non-environmental Commission staff would make a determination on whether to grant a party's out-of-time intervention request.

IND842-2 See the response to comment IND210-5 regarding invasive species.

IND842-3 Revegetation would not be considered complete until vegetation is similar in density and cover of non-nuisance vegetation to adjacent undisturbed lands. The FERC would monitor restoration until it is deemed complete.

IND 842-4

I am especially concerned about MVP's request for amendments to the LRMP for the Jefferson National Forest. The Jefferson National Forest is a beloved and valued resource in Southwest Virginia. Granting of the proposed amendments to the Mountain Valley Pipeline project would result in a significant degradation of this resource.

Amendment 1 is of special concern to the region as it would condemn a 500 foot wide swath through the existing forest as a Designated Utility Corridor without the potential of future environmental impact review. It is both unfair and unwise to deny future generations the ability to speak their concerns regarding preservation of the environment and to prevent additional degradation of natural resources.

Amendment 2 requests that Mountain Valley Pipeline be able to exceed designated restrictions on soil and riparian corridor conditions. These restrictions are in place to help maintain the integrity of the landscape and waterways. Despite claims of being able to mitigate adverse effects resulting from relaxing these restrictions, their relaxation will result in increased erosion and pollution of streams by eroded sediments. This is of special concern in the Jefferson National Forest as much of the path of the pipeline through the forest will be over rugged terrain with steep slopes.

Amendment 3 requests that MVP be granted permission to remove old growth trees within the MVP construction corridor. Old growth trees are becoming an increasingly rare resource in our growing urbanized society. They are valued for their beauty and sense of solitude that they incorporate into the landscape. It would be most sad to sacrifice them for a project whose lifespan is several times less than their age.

Amendment 4 would allow the MVP to cross the Appalachian Trail on Peters Mountain. The Appalachian Trail is a national treasure and draws hikers from across the nation and around the world. Peters Mountain section of the Appalachian Trail is currently rated as having high scenic integrity. Allowing the pipeline to cross the trail along this section would destroy the aesthetics where it crosses and reduce the pleasure of hikers along this section of the trail.

Therefore I ask that the National Forest Service deny MVP's request for amendments to the LRMP for the Jefferson National Forest.

I further request that the permit for the construction of the Mountain Valley Pipeline be denied due to potential significant adverse environmental impacts.

Thank you for your consideration.

William J. Sydor
P.O. Box 375
Blacksburg, VA 24063-0375

(540) 951-4325

IND842-4 See the response to comment FA8-1 regarding Amendment 1. See the response to comment FA10-1 regarding Amendment 2, 3, and 4.

Paul E. Washburn
117 Cider Hill Road
Newport, VA 24128

December 22, 2016

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission (FERC)
888 First Street, N.E.
Washington, DC 20426

Re: Mountain Valley Pipeline (MVP) – Docket No. CP16-10-000
Draft Environmental Impact Statement (DEIS)
Transco Interconnect and Hydraulic Flow Model Discrepancy

Dear Ms. Bose:

IND 843-1

This Docket CP16-10 comment concerns a section of the DEIS containing limited information about MVP infrastructure, which leads to an apparent discrepancy in the hydraulic flow model underlying pipeline design. To remediate these issues, the final EIS must verify and explicitly confirm the following aspects of the MVP project:

1. All MVP-required facilities at Transco Station 165 are fully specified, as described in DEIS section 2.1.2.1 "Mountain Valley Project" – specifically: one M&R station consisting of filters, meters, overpressure protection, and a pig receiver.[1]
2. A qualified individual, independent of the MVP and EEP projects, has reviewed and certified the hydraulic flow model for accuracy and completeness. This model is contained in (privileged) Exhibit G of the MVP application.[2]

The remainder of this comment describes analysis supporting the need to include these explicit statements of review and understanding by the FERC in its EIS process.

IND 843-2

TRANSCO INTERCONNECT

Interconnect facilities are described in the MVP Application as follows:[3]

> "Transco provided an interconnect scope of work in June 2015 and a field visit is expected. At this time, other than standard accommodations for a new interconnect, Transco has not identified any other modifications to its existing Station 165 required to

[1] *Mountain Valley Project and Equitrans Expansion Project, Draft Environmental Impact Statement*, September 2016, FERC Docket CP16-10-000 and CP16-13-000, E-Library Reference 20160916-4001, Report Page 2-14, PDF page 1992/2671
[2] *Application of Mountain Valley Pipeline, LLC For Certificate of Public Convenience and Necessity and Related Authorizations*, October 23, 2015, FERC Docket CP16-10-000, E-Library Reference 20151023-5035, Referenced in Cover Letter, PDF page 2/542
[3] *Resource Report 1 – General Project Description*, Mountain Valley Pipeline, LLC, October 2015, FERC Docket CP16-10-000, E-Library Reference 20151023-5035, Page 1-4, PDF 19/288

IND843-1 The proposed facilities are described in section 2 of the final EIS. FERC engineers review project design.

IND843-2 Information about MVP design was provided in Mountain Valley's application to the FERC and is summarized in section 2 of the EIS.

IND 843-2 cont'd

> receive gas from MVP. MVP does not believe any modifications on Transco's system are needed upstream or downstream of Station 165 to handle volumes from this Project."

The DEIS describes some interconnect-related equipment, but not in language that necessarily limits the extent to which MVP may require future modifications or additions:[4]

> "Mountain Valley proposes to interconnect with four existing Transco pipelines at existing Station 165 (Pipelines A and B are 30 inches in diameter; Pipeline C is 36 inches in diameter; and Pipeline D is 42 inches in diameter). Components of the Transco interconnect and M&R station would include five gas filter separators, six 16-inch ultrasonic gas meter runs, four 16-inch overpressure protection/flow control meter runs, two 26-inch overpressure protection security valve runs and a pig receiver. The pig receiver would attach directly to the MVP pipeline. A meter building would enclose the meter runs and a control valve building would enclose the control valve runs. One electronics building would be erected for Transco's equipment, and another for Mountain Valley's."

Furthermore, the MVP Application and subsequent DEIS provide operational details for the three compressor stations, such as suction and discharge pressures, but no such information is available for the pipeline termination. Therefore it must be assumed that MVP will supply gas to the Transco pipeline system between its typical and maximum allowable operating pressures. Based on public information[5], this pressure range is inferred as 800 psig to 1440 psig for the facilities at Transco Station 165.

HYDRAULIC FLOW MODEL

IND 843-3

Since the MVP-provided flow model is considered Critical Energy Infrastructure Information (CEII), it is not available for public review. As such, it is the FERC's responsibility to assess the accuracy and completeness of this document, identified as Exhibit G in the MVP application. With potentially significant environmental impacts resulting from modeling errors and/or inappropriate assumptions, it is imperative that a robust and independent review be conducted on this applicant-produced analysis.

In addition to exercising due diligence in preparing the EIS, there are also compelling results from external-to-the-project hydraulic flow models to motivate a third party review. These contradictory results raise questions about the parameters and structure of the MVP model.

As an example, consider the 147-mile segment of the pipeline from Fayette, WV to Pittsylvania, VA. The "Stallworth" compressor station at Fayette is designed for a 1440 psig discharge into this final segment.[6] Based on an appropriate flow model (see Appendix 1), an absolutely straight pipe of similar design to the MVP would require 94% transmission efficiency for the 640 psi pressure drop to maintain 2 bcf/day at 800 psig into Transco's interconnect.

[4] Ibid Ref #1 – DEIS Page 2-14, PDF page 1992/2671
[5] *Corrective Action Order, CPF No. 202011-1011H,* December 6, 2011, U.S. DOT PHMSA Office of Pipeline Safety, Page 2. http://primis.phmsa.dot.gov/comm/reports/enforce/documents/220111011H/220111011H_CAO_12062011_text.pdf
[6] Ibid Ref #1 – DEIS Page 2-13, PDF page 1991/2671

IND843-3 FERC engineers reviewed the design for the MVP. Their findings may be discussed in the Commission Order.

IND 843-3 cont'd

While 94% efficiency may a reasonable estimate for new, straight, smooth pipe, it is extremely optimistic -- beyond reason -- for the reality of the MVP. First, as the MVP ages, its internal surfaces will degrade by normal wear and tear, resulting in decreased efficiency. Second, and far more relevant to efficiency derating, is the contorted path of the MVP. It is not a 147-mile long straight pipe. Rather, there are thousands of bends, including a number of 90-degree elbows in the analyzed segment. A model efficiency over 90%, or even 80%, is not realistic in this case.

The complexity of the pipeline path and components prohibits accurate "hand" modeling of flow conditions expected at the Transco interconnect. Nevertheless, this exercise to compute the target operating pressure at the endpoint of a simple straight-pipe model raises questions about the validity of the applicant's detailed model.

With correct assumptions, parametrization, and structure, a computer-assisted hydraulic flow model can accurately predict conditions along the pipeline. A qualified individual, such as a Professional Engineer with qualifications in pipeline design, is necessary for verification and validation of the model results, and their implications on pipeline operation and safety. The following aspects of the pipeline model are of concern for the MVP review:

1. Does the Model Structure:
    a. Represent the applicant's final route?
    b. Contain sufficient detail related to direction changes?
    c. Contain sufficient detail for flow restrictions (e.g., valves, instruments, etc.)?
    d. Use appropriate internal computations?
2. Are the Operating Conditions:
    a. Consistent with stated capacity of 2 bcf/day?
    b. At maximum design values (e.g., compressor discharge)?
    c. Within industry norms and best practices (e.g., maximum gas velocity)?
    d. Compliant with legally required safe levels?
3. Are the Material Conditions:
    a. Correct for the transmission gas (e.g., composition, temperature, etc.)
    b. Correct for the pipeline (e.g., sizes, surface conditions, wall thickness, etc.)

From an environmental review standpoint it is critical for the model to be complete and accurate. Significant errors could result in the pipeline failing to meet design criteria, or worse, allowing dangerous conditions leading to an accident with loss of property or life. It is imperative for the FERC to independently review and certify this critically important part of the project application.

Sincerely,

Paul E. Washburn

Paul E. Washburn

INDIVIDUALS

IND844 – Beth Covington

20161222-5283 FERC PDF (Unofficial) 12/22/2016 12:18:32 PM

MVP DEIS Comment 1

RE: Docket CP-16-10-000

Dear FERC Folks,

IND 844-1

It is difficult to see how this commission could possibly be fair and impartial in deciding to deny or permit the Mountain Valley Pipeline. FERC's web page states :"Prior to joining the Commission in 2010, Commissioner LaFleur had more than 20 years' experience as a leader in the electric and natural gas industry." I understand that FERC is a revolving door for energy industry folks. After leaving FERC, some become lobbyists for Big Energy in Washington, DC or return to positions of power within the oil & gas industry, until they retire to enjoy their millions...or perhaps, billions.

The interests of the average Appalachian American,(a rural, low-income, less-educated person), who is most likely to be affected by burgeoning pipeline construction, are not represented at all. AT ALL. Taxation without representation was at the root of the American Revolution. I suspect that rampant construction of fossil fuel infrastructure without proper representation for those affected by it will be at the root of the coming American Energy Revolution--a revolution I hope will embrace green energy technologies that exist **right now** and are at our very fingertips--before it's too late. The United States can lead the world to its destruction--or, hopefully, our country's change in the right direction can begin with you, FERC.

IND 844-2

A March 2016 Gallup poll revealed "Seventy-three percent of Americans say they prefer emphasizing alternative energy, rather than gas and oil production, as the solution to the nation's energy problems." and " **A** Majority of Republicans Now Support Alternative Energy" and " a bipartisan coalition could form in support of an alternative energy strategy" . In fact, recent Gallup polls show "Americans' concern about global warming is at an eight-year high" A Pew Research poll conducted in March shows that "74% of U.S. adults said " the country should do whatever it takes to protect the environment."

As a direct contact, "boots on the ground" interviewer of most of the folks on the proposed and alternate pipeline routes, I can tell you that a majority of them, even the ones who signed easements, do not want this pipeline to be built here. Many of those signers--and those who will never sign-- have been bullied and hounded by surveyors and landmen. I've attended many meetings where a majority of people in Greenbrier, Summers, Monroe Counties in WV and the VA affected counties state that they are opposed to the constuction of MVP. Unfortunately, many of them have not gone through the necessary hoops to submit their comments formally to FERC.

How can us average West Virginians, myself included, muster the motivation to send comments to FERC when it appears the game is "rigged"? (a term our president-elect is fond of using when it suits him.) There are a multitude of others in the area who feel, as I do, that MVP is a horrendously bad idea and that it should be scrapped entirely, but they are too beaten down and discouraged to fight. It is just common sense not to waste time and energy on a task that will make no difference. Why cast your pearls before swine, so to speak? You have to understand that the Appalachian American people here are strong, but have been so continuously trampled and quashed by successive extractive industries

IND844-1 The EIS was written by FERC staff, assisted by our third-party environmental contractor, and cooperating agencies. This is a group of unbiased scientists. The Commissioners, who are appointed by the President and approved by the Senate, would decide whether or not to authorize the projects, based on the record and the factors outlined in section 1.2.3 of the EIS. While the Commission fulfills its obligations under the NGA, it is the President and Congress who determine this nation's energy policies; which is entirely democratic and representative, since they are elected by voters in the project area.

IND844-2 Renewable energy alternatives are discussed in section 3 of the EIS. See also the response to comment IND40-1 regarding renewable energy. Public comments were taken into consideration in the production of this EIS.

IND 844-2 cont'd

that many feel they can't fight another "Goliath" such as MVP. I hope FERC will take into consideration that for every comment you receive opposing MVP, there are hundreds of Appalachian Americans who feel the same way but were unable, for various reasons, to submit a formal comment.

Against my own natural inclinations, I have decided to be one of those "Davids" who comments to FERC repeatedly, hoping that perhaps one comment may hit its mark, squarely between the eyes of the FERC/ MVP "Goliath". The lumping of FERC and MVP together is no accident. I believe there is collusion and, dare I say, conspiracy between these two agencies, although one is supposed to regulate the other.

I look forward to the day that a revamped FERC is charged with regulating renewable, green energy projects which don't harm the water, air and earth--- or steam roll over the sacred heritage of indigenous, native people, or bulldoze and crush the landowners' rights of rural, Appalachian people who happen to be in in the path of a fossil fuel project like Dakota Access or MVP. That day is coming sooner than you think.

Therefore, I suggest FERC do some immediate soul searching. I imagine you are doing the job you're in primarily to provide for your families, and to use your God-given talents and interests. Please remember that those you love live on the same planet as we Appalachian Americans. Our home is their home. Our water is their water. Our future is their future. May God guide you to do the right thing.

Sincerely,

Beth Covington and Michael T. Martin

PO BOX 57, Greenville, WV 24945

304-832-6078 covington925@hotmail.com

Erin Bicknese, Knoxville,, TN.
Please deny the proposal for the Mountain Valley Pipeline.

IND 845-1

I am concerned about the Jefferson National Forest. This pipeline will violate the current Forest Management Plan, and I oppose the amendments to the USFS Land and Resource Management Plan that would allow for the pipeline. They will weaken existing protections on public land, that are incredibly important. The Forest Service has a responsibility to protect the JNF, and should speak up against the harm that will be done if it is built.

Additionally. studies show that current energy demand can be met by existing infrastructure. Building this pipeline will not only be harmful, it is unnecessary.

I am also concerned about this project's contribution to climate change, which already affects and will increasingly affect all of us.

Then there is the Historic Preservation aspect of this issue. The pipeline would go through Newport, and threats to historic places violate The National Historical Preservation Act, and are not mitigatable.

Finally, I'm concerned about the karst hydrology and erosion. Even following your best management practices, it would be impossible to prevent erosion and landslides in this mountainous and wet landscape.

Thank you for your consideration.
Sincerely,
Erin Bicknese

IND845-1 The Commission would decide if the projects are necessary. Section 3.3 of the EIS provides an assessment of using existing systems as an alternative. The EIS provides a discussion of climate change in sections 4.11 and 4.13. Historic places are discussed in section 4.10. Impacts on historic properties can be mitigated, in accordance with the regulations for implementing Section 106 of the NRHP at 36 CFR 800. Karst and landslides are addressed in section 4.1. See the response to comment IND70-1 regarding erosion.

INDIVIDUALS

IND846 – Anne Petrie Dobbs Brown

20161222-5299 FERC PDF (Unofficial) 12/22/2016 1:58:12 PM

December 21, 2016

Subject: Docket CP16-10-000: Comments on the DEIS for the proposed Mountain Valley Pipeline

IND 846-1

Dear Secretary Bose and Members of the Commission:

The proposed Mountain Valley Pipeline (MVP) is not in the public interest. It poses very real threats to public health and safety in West Virginia and Virginia. Not only will it have permanent adverse impacts on the local environment, it will also drive several more decades of global climate pollution. The primary beneficiaries of the pipeline will be private companies. The Draft Environmental Impact Statement (DEIS) issued by the Federal Energy Regulatory Commission (FERC) rightly concludes that constructing the pipeline will have significant adverse impacts to forests. However, the DEIS fails to fully account for the other threats posed by the MVP.

The DEIS merely states that pipeline developers would comply with minimum construction and operation standards. It gives no reason for people living within the 1,400-foot blast radius to feel safe. Recent news reports are alarming, documenting pipeline leaks, accidents and explosions on an almost routine basis. There is just no way to justify the risk of an explosion or leak to the people who live within the quarter-mile, which includes me and many other family and friends.

Many studies and reports have shown that there are enough existing pipelines to carry the gas needed to meet customer demand in the Mid-Atlantic and Southeast. As many states shift their electric generation from coal and gas to wind, solar, and other renewable, it's likely that demand for gas will decrease in the long run. But right now, bad policies are creating incentives for companies to overbuild the pipeline, including the MVP.

IND 846-2

People living in the region rely on headwater streams and other water resources that stand to be significantly impacted by this project, yet the DEIS dismisses these concerns, saying only that developers would "evaluate any complaints" and "identify suitable settlements" in the event of contamination. The MVP's proposed route would cross three major aquifers and come within one tenth of a mile of two public water supplies, not to mention an affecting an untold number of private drinking wells including, quite possibly my own. The project would also cross hundreds of streams, springs and wetland areas across Pennsylvania, West Virginia, and Virginia. Are we willing to risk the failure of an underground pipeline that carries 2 billion cubic feet of gas per day when headwater streams, wells, and municipal drinking water supplies are so close?

Because of the vulnerability of critical water resources in the karst areas at the base of Peters Mountain, I support the requests that have been made by the Monroe County Commission and others, that the FERC require an independent, comprehensive hydrogeological study of the public and private water resources in Monroe County (especially in areas of karst) before issuing a Revised Draft Environmental Impact Statement or a Final EIS, or approving an MVP route through Monroe County. I also encourage the GW & Jefferson National Forest office to complete such a study per the request of numerous citizens and citizen groups as well as public officials, on Peters Mountain before any decision is made about crossing this unique aquifer.

IND846-1 The Commission would decide if the projects are in the public interest. See the response to comment IND2-1 regarding safety. Climate change is discussed in sections 4.11 and 4.13 of the EIS. See the response to comment FA15-5 regarding forests. Section 3.3 of the EIS provides an assessment of using existing systems as an alternative. Renewable energy alternatives are discussed in section 3 of the EIS. See also the response to comment IND40-1 regarding renewable energy.

IND846-2 Water resources are discussed in section 4.3. See the response to comment IND3-1 regarding drinking water. See the response to comment CO34-1 regarding hydrogeological studies.

INDIVIDUALS

IND846 – Anne Petrie Dobbs Brown

IND 846-3 There has not been a sufficient analysis of the full climate impacts as required under NEPA. The MVP would enable significantly more gas to be shipped, which means significantly more gas can be extracted using fracking techniques in the Marcellus shale region. Natural gas is predominantly methane. While methane does have a lower global warming impact than coal during electricity generation, it still accelerates climate change. The risk to increased air pollution and climate change over the next 10 to 50 years are extraordinary.

IND 846-4 FERC concedes that there will be permanent adverse impacts to forests. The MVP would cross thousands of acres of prime forest land and habitat for species listed as threatened and endangered. It would cross national treasures like the Appalachian Trail, the Jefferson National Forest, Peters Mountain, the Blue Ridge Parkway, the Weston and Gauley Bridge Turnpike to name just a few. The U.S. Forest Service has raised several of these forest impact issues, yet they have not been addressed by FERC or the project partners. The project will also permanently impact farmland, Wilderness areas, Inventoried Roadless Areas, Old Growth Forest, fragile karst areas and fragment habitats of species listed threatened or endangered. Yet again, the DEIS waves off these concerns, only saying that FERC will consult with the U.S. Fish & Wildlife Service or will "mitigate" these concerns while offering not real plans on how this could be done. The Appalachian Trail Conservatory has stated that the impacts to the AT are severe and would impact the trail like no other project ever. The EIS process should not move forward until all concerns raised by the United States Forest Service, the Appalachian National Scenic Trail, the BLM and citizens are addressed.

IND 846-5 There is also the issue of sliding or unstable terrain in our area. Pictured here is a slide at the end of my driveway, not far from the pipeline corridor that crosses just behind my house on Ellison's Ridge. This is this is just one example of slide in the immediate area.

IND846-3 Climate change is addressed in sections 4.11 and 4.13 of the EIS. See the response to comment IND2-3 regarding hydraulic fracturing.

IND846-4 See the response to comment FA15-5 regarding forest impacts. Section 4.8 of the final EIS provides a revised discussion on the ANST, Jefferson National Forest, BRP, and Weston and Gauley Bridge Turnpike. The FS is a cooperating agency and assisted in preparation of the EIS. The MVP pipeline would not cross any designated Wilderness areas. Karst is discussed in section 4.1 of the EIS; and threatened and endangered species in section 4.7.

IND846-5 The EIS provides a discussion of landslides in section 4.1.