July 2015

Michigan Petroleum Pipeline Task Force Report

Message from Attorney General Bill Schuette and DEQ Director Dan Wyant

Co-Chairs of the Michigan Petroleum Pipeline Task Force

Dear Governor Snyder, Members of the Legislature and Citizens of Michigan:

On July 26, 2010, Michigan experienced the largest inland oil spill in U.S. history. Enbridge's Line 6B, carrying Alberta tar sands heavy crude oil, burst and began flowing into Talmadge Creek, a tributary of the Kalamazoo River. After almost five years and more than a billion dollars, the bulk of the clean-up and restoration has been completed, but work to restore the river will continue for years.

In October of 2012, the National Wildlife Federation issued a report entitled "Sunken Hazard: Aging oil pipelines beneath the Straits of Mackinac an ever-present threat to the Great Lakes." That report identified a major pipeline system that had been "hidden in plain sight" for over 60 years, Enbridge's Line 5 pipelines crossing at the Straits of Mackinac. The Straits Pipelines (Line 5 is split into two pipelines when it crosses the Straits) are within a few miles of two of Michigan's most recognizable icons, the Mackinac Bridge and Mackinac Island. Constructed in 1953, before the "Mighty Mac" was even built, those pipelines currently carry over 500,000 barrels of oil and other liquid petroleum products every day.

The combination of a huge upsurge in the transportation of oil from North America's newly productive oil fields, incidents like the Line 6B spill, and the tragic accident involving a train hauling oil in Lac-Megantic, Quebec, has elevated the debate across the country over the costs and benefits of different types of oil transportation. Given Michigan's unique experience with the Line 6B spill and the location of major petroleum pipelines near or even in our precious water resources, last summer we determined that we should undertake a thorough examination of Michigan's liquid petroleum pipelines.

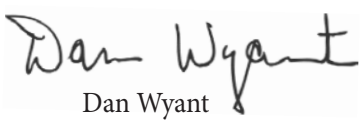
To accomplish this, we formed a task force made up of agencies that had technical expertise, regulatory authority, public land and infrastructure management responsibilities, and emergency response experience. We set out to determine what the State knew about its existing petroleum pipelines and what the State needed to know to make informed decisions going forward to protect Michigan's citizens and natural resources. To that end, we invited a diverse group of interested parties that would have knowledge, interest, and opinions on the topic to meet with the Task Force. These included environmental and other public interest groups, members of the energy industry, including Enbridge, federal regulators, and academics and technical experts. We also held two government-to-government consultations with Michigan's tribal governments, and received many written comments from the public. Finally, staff from the involved agencies spent many hours researching and gathering information.

The result of almost a year of information gathering and analysis by the Task Force produced thirteen recommendations. Four of those recommendations are directed at the Straits pipelines, which everyone agrees present the most acute potential threat. These recommendations would minimize short-term risks and give the State necessary information to evaluate the risks to the Straits from the pipelines, and to evaluate alternatives to the existing pipelines.

The remaining recommendations apply statewide. These recommendations would: 1) ensure that state agencies are fully informed, coordinate their actions, and are prepared to respond to emergencies; 2) potentially allow for increased state involvement in oversight of interstate petroleum pipelines; 3) result in better coordination with the federal government; and 4) increase transparency and facilitate public participation in decision making.

Sincerely,

Bill Schuette
Attorney General



Dan Wyant
DEQ Director

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Michigan Petroleum Pipeline Task Force Report
EXECUTIVE SUMMARY

Over 60 years ago, the Lakehead Pipe Line Company completed what would be considered an engineering feat even by modern day standards. It designed, engineered, and built a 644-mile oil pipeline system stretching from Superior, Wisconsin to Sarnia, Ontario – including two pipelines under the Straits of Mackinac (Straits Pipelines). Approximately 16 years later, it completed a southern pipeline route stretching from Superior, Wisconsin south to Chicago and then northeast across the Lower Peninsula of Michigan to Sarnia. Both pipelines are now owned and operated by Enbridge Energy.

In 2010, the pipeline on the southern route failed, releasing 840,000 gallons of heavy crude oil into the Talmadge Creek/Kalamazoo River. That failure represents the largest inland oil spill in U.S. history. In light of this spill, it is not surprising that public and governmental attention turned to the older pipelines that run under the Straits of Mackinac, and the devastating ecological and economic damage that would occur if those pipelines failed.

It is against this background that in June 2014, Michigan Attorney General Bill Schuette and Dan Wyant, Director of the Michigan Department of Environmental Quality, announced they would co-chair a multi-agency task force to address petroleum pipelines in Michigan. The goal of the Michigan Petroleum Pipeline Task Force was to identify and recommend actions within state government to protect the public health, safety and welfare of Michigan citizens and the environment related to the transportation of liquid petroleum products through major pipelines within the state.

While the Task Force had a specific focus on the Straits Pipelines, it also looked more broadly at the major pipelines used to transport crude oil and other liquid petroleum products through and within Michigan. This included both intrastate pipelines and portions of interstate pipelines located within the state. The Task Force did not review: (a) natural gas pipelines; (b) "upstream" pipelines used in oil or gas exploration and production; or (c) pipelines used within individual properties (*e.g.,* oil/petroleum bulk storage or processing facilities, gasoline or fueling stations, heating oil systems, *etc.*).

The Task Force met seven times between August 2014 and April 2015, its efforts being supported by Work Groups that met regularly and more frequently during the same time period. As a result of the information gathered by the Task Force and its various Work Groups and after much consideration, the Task Force members unanimously adopted the following recommendations:

Specific Recommendations regarding the Straits Pipelines

1. Prevent the transportation of heavy crude oil through the Straits Pipelines.
2. Require an independent risk analysis and adequate financial assurance for the Straits Pipelines.
3. Require an independent analysis of alternatives to the existing Straits Pipelines.
4. Obtain additional information from Enbridge relating to the Straits Pipelines.

Statewide Recommendations

1. Coordinate mapping of existing pipelines among state agencies.
2. Ensure that state agencies collaborate on emergency planning and spill response.
3. Ensure coordinated emergency response training exercises and drills.
4. Ensure regular state consultation with the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) on hazardous liquid (including petroleum) pipelines.
5. Consider legislation requiring state review and approval of oil spill response plans, improved spill reporting, and more robust civil fines.
6. Evaluate whether to establish a Hazardous Liquids Pipeline Safety Program in Michigan.
7. Consider legislation or rulemaking to improve siting process for new petroleum pipelines.
8. Consider issuing an Executive Order creating an Advisory Committee on Pipeline Safety.
9. Create a continuing Petroleum Pipeline Information website.

It is the Task Force's view that each of the recommendations above would help protect the health, safety and welfare of Michigan's citizens, along with its environment. The Task Force urges the Governor, relevant agencies, and the Michigan Legislature to consider these recommendations as early as possible.

For more information visit: www.michigan.gov/pipelinetaskforce

ORGANIZATION OF THE TASK FORCE

Because the goal of the Task Force was to identify and coordinate possible actions to be taken by state government, it was comprised of state officials. The members of the Task Force included the heads of the following state agencies and their designated staff:

- **Bill Schuette**, Michigan Attorney General, Co-Chair
- **Dan Wyant**, Director, Michigan Department of Quality, Co-Chair
- **Jon Allan**, Director, DEQ Office of the Great Lakes
- **Keith Creagh**, Director, Michigan Department of Natural Resources
- **Colonel Kristie Kibbey Etue**, Director, Michigan State Police
- **Captain Chris Kelenske**,
  Michigan State Police Emergency Management and Homeland Security Coordinator
- **John Quackenbush**, Chairman, Michigan Public Service Commission
- **Kirk Steudle**, Director, Michigan Department of Transportation

Although Task Force members were drawn from within state government, the Task Force gathered information from a wide range of external sources including non-governmental organizations, industry representatives, federal agencies, tribal governments, academics, and members of the public, as outlined in this report.

Michigan Petroleum Pipeline Task Force - Agency Staff and Work Group Members

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Carol Isaacs, Chief Deputy Attorney General
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Department of Transportation

Robert Sweeney
Eileen Phifer

BACKGROUND/SETTING THE STAGE

In order to fully appreciate the complexity of the issues considered by the Task Force, it is essential to understand the tremendous role of petroleum in our economy and the issues surrounding the transportation of crude oil and refined petroleum products.

Petroleum's Vital Role in the U.S. and Michigan Economies

1. Petroleum and the U.S. Economy Generally

Petroleum plays a vital role in virtually every sector of the U.S. economy, and in the economy of every state. Petroleum products are essential to our way of life – transportation, manufacturing, farming, and even in our homes. Our economy is directly impacted by the employment and production within the oil industry, indirectly through the industry's purchases of intermediate and capital goods from other U.S. industries, and also by the personal purchases of employees and business owners within the oil and gas industry.[1]

As of 2011, including the operational and capital investment impacts, the oil and gas industry supported 9.8 million full-time and part-time jobs in the U.S. – about 5.6% of the total U.S. employment. The industry's total impact on U.S. Gross Domestic Product (GDP) was $1.2 trillion, or about 8% of the U.S. economy.[2]

It is also important to note that the United States is the biggest consumer of crude oil in the world (20 million barrels per day), the number one importer of oil, and if current forecasts hold, will soon be the biggest producer of crude oil in the world. Annually, the U.S. spends nearly $1.5 trillion on crude oil – more than 8% of its GDP.[3] About 50% of daily consumption is produced domestically, with the remaining 50% imported from some 80 countries.[4] Thus, any changes in oil production or consumption greatly affect our economy.

2. Petroleum and Michigan's Economy

"The Great Lakes… region is particularly dependent on petroleum and related products."[5] As of 2011, Michigan ranked 11th in the country in terms of the total number of jobs directly or indirectly attributable to oil and gas operations.[6] According to the Michigan Oil and Gas Producers Education Foundation,[7] Michigan's oil and gas industry:

- Provides more than 10,000 industry-related jobs.
- Pays 14,000 private mineral owners more than $80 million in royalties annually.
- Has paid nearly $1 billion in oil and gas income (royalties, rentals, lease bonuses) to the State of Michigan since 1927.
- Pays more than $40 million in severance taxes annually.
- Contributes millions of dollars in local property taxes on oil and gas wells, pipelines and surface facilities each year.

1 PriceWaterhouseCoopers, *Economic Impacts of the Oil and Natural Gas Industry on the U.S. Economy in 2011* (Washington, D.C. July 2013). (Prepared for the American Petroleum Institute).
2 PriceWaterhouseCoopers, *supra* at E-2.
3 Reza Varjavand, *Falling crude oil prices impact on the U.S. economy,* Chicago Tribune March 13, 2015.
4 *Id.*
5 The Great Lakes Commission, *Issues and Trends Surrounding the Movement of Crude Oil in the Great Lakes-St. Lawrence River Region* (February 2015), p. 22, *available at* <http://glc.org/files/projects/oil/GLC-Oil-Report-20150220-FINAL.pdf> (accessed June 22, 2015).
6 *Id.*
7 Michigan Oil and Gas Producers Education Foundation, *Effects of Oil and Gas on Our Economy* <http://www.mogpef.org/EffectsofOilGas/OnOurEcomony.aspx> (accessed June 11, 2015).

- Provides about $7 million in privilege fees to the state annually (which underwrites the DEQ's Office of Oil, Gas and Minerals, which is responsible for monitoring and enforcing industry compliance with state and federal laws).
- Generates a total value of $865 million in Michigan crude oil and natural gas production annually, which in turn, results in an additional $1.1 billion of business activity.

According to the Michigan Oil & Gas Association, the industry has produced a total value of $17.6 billion in Michigan crude oil and natural gas since 1925.[8]

3. The Resurgence and Growth of the U.S. Petroleum Industry

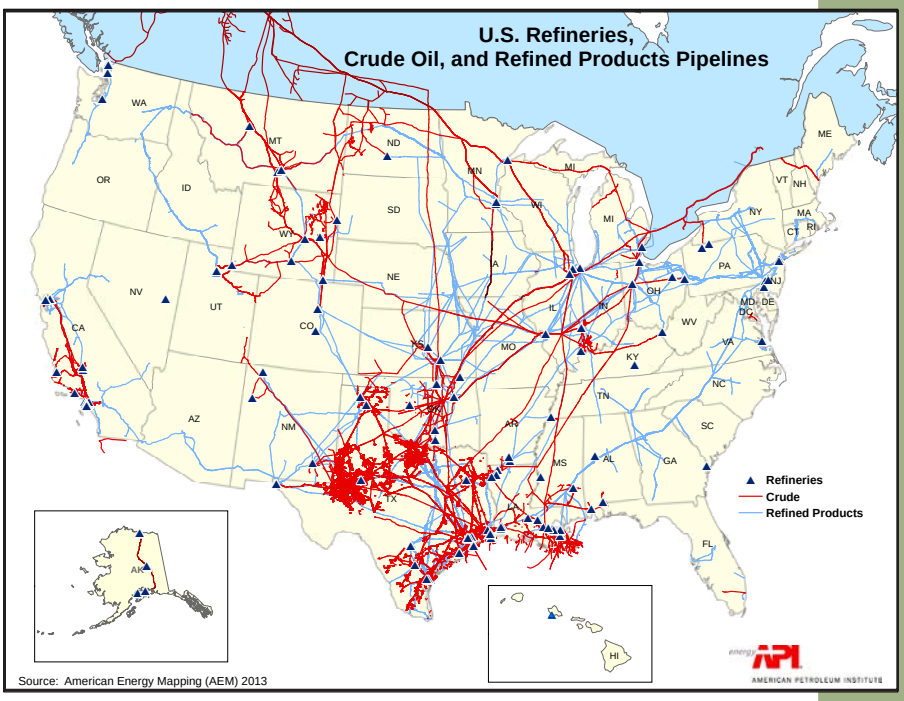
The U.S. Energy Information Administration (EIA) recently announced that in 2014, U.S. oil production increased by 1.2 million barrels per day to 8.7 million barrels per day, the largest increase in over 100 years.[9] Most of the 2014 increase came from "North Dakota, Texas, and New Mexico where hydraulic fracturing and horizontal drilling were used to produce oil from shale formations."[10] The EIA projects continued growth in 2015 and 2016, though at a slower pace.

It is predicted that oil and gas industry growth, particularly the expected rise in crude exports, will have a significant impact on the U.S. and state economies. In fact, a recent study stated that the increase of U.S. crude oil exports would result in an additional 8,520 jobs and $1.27 billion in income contribution in Michigan by 2020.[11]

Transportation of Crude Oil and Petroleum Products in the United States

A vast and complex transportation system has been developed to meet the needs of the petroleum industry in the United States. The system includes pipelines, ships and barges, tanker trucks, and rail. In 2013, 70% of crude oil and petroleum products were transported by pipeline, 23% by tankers and barges over water, 4% by tanker trucks, and only about 3% by rail.[12]

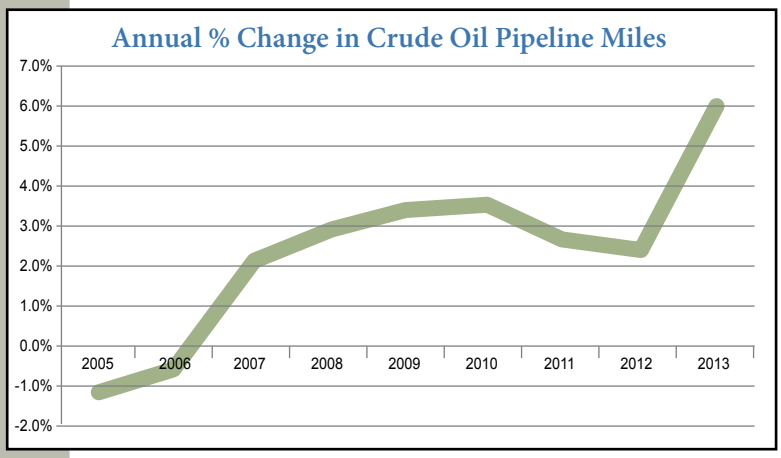
The increase in oil and gas production, though good for the economy, has resulted in a strain on the current transportation system. The location and type of crude being produced has further complicated the transportation options.



8 *Id.*
9 U.S. Energy Information Administration, *U.S. oil production growth in 2014 was largest in more than 100 years, available at* <http://www.eia.gov/todayinenergy/detail.cfm?id=20572> (accessed June 21, 2015).
10 *Id.*
11 American Petroleum Institute, *Crude Exports Yield Economic Benefits Across 50 States* (2014) <http://www.api.org/~/media/files/policy/exports/crude-oil-export-onepager.pdf> (accessed June 11, 2015).
12 James Conca, *Pick Your Poison for Crude – Pipeline, Rail, Truck or Boat,* Forbes (April 26, 2014) *available at* <http://www.forbes.com/sites/jamesconca/2014/04/26/pick-your-poison-for-crude-pipeline-rail-truck-or-boat/> (accessed June 21, 2015). (The article also notes that in Canada, 97% of natural gas and petroleum products are transported by pipeline.)

1. Petroleum Transportation by Pipelines

Pipelines are the most important mode of transportation in the petroleum industry. Liquid petroleum pipelines crisscross the United States – moving crude oil from the oil fields on and off shore to refineries, and from refineries to terminals where the fuels are transported to retail outlets.[13] As in the rest of the country, more oil is transported through the Great Lakes-St. Lawrence River basin by pipeline than any other mode.[14]



The substantial amount of crude oil and petroleum products transported by pipeline continues to grow and shows no sign of slowing down – in either amount transported or miles of pipeline.

In 2013, liquid petroleum pipelines transported nearly 15 billion barrels of crude oil and petroleum products in the United States.[15] About 55% of this, or 8 billion barrels, was crude oil.[16] This represented an 11.2% increase in the amount of crude oil transported by pipeline from the preceding year, and 19.4% increase in the last five years.[17]

The total mileage of U.S. liquids pipelines was 192,396 miles in 2013, of which 60,911 miles carried crude oil.[18] U.S. crude oil pipeline mileage also saw significant growth: it increased 15.5% over the last 5 years, and 23.6% over the last 10 years.[19]

2. Petroleum Transportation by Oil Tankers/Barges

As noted above, oil tankers or barges, the second largest transportation category, transport 23% of U.S. petroleum and petroleum products. Overseas vessels have traditionally delivered imported crude to U.S. refineries, and continue to do so. River barges also deliver oil from some railroads to refineries within the U.S. and along the U.S. coast. Finally, "shuttle tankers" are sometimes used to carry petroleum from offshore wells to refineries as it is sometimes cost prohibitive to build offshore pipelines – especially if the oil and gas field is small.

One of the major advantages of water transport is the large volume that can be carried in a single trip, thus reducing the costs of transport significantly. A single river barge holds 10,000 to 30,000 barrels of oil (420,000 – 1.26 million gallons), and often 2-3 barges are towed together.[20] Ocean-worthy tankers, such as those that travel from Alaska to west coast refineries, can carry over one million barrels (42 million gallons).[21]

Vessels carrying oil have adopted many important safety measures – especially since the devastating *Exxon Valdez* oil spill. Among the most important measures adopted is the double-hull design, essentially a hull within a hull configuration. In fact, all single hulled tankers operating in U.S. waters are to be phased out of use by the end of this year (2015).[22]

13 American Petroleum Institute, *Where are the oil pipelines?* <http://www.api.org/oil-and-natural-gas-overview/transporting-oil-and-natural-gas/pipeline/where-are-the-oil-pipelines> (accessed June 21, 2015).
14 The Great Lakes Commission, *supra* at p. 5.
15 Association of Oil Pipe Lines, *U.S. Liquids Pipeline Usage and Mileage Report* (October 2014), *available at* <http://www.api.org/~/media/files/oil-and-natural-gas/pipeline/whats-new/us-liquids-pipeline-usage-mileage-report-oct-2014.pdf> (accessed June 21, 2015).
16 *Id.*
17 *Id.*
18 *Id.*
19 *Id.*
20 Congressional Research Service (CRS), *U.S. Rail Transportation of Crude Oil: Background and Issues for Congress,* December 4, 2014.
21 *Id.*
22 *See,* Shell Oil, *Transporting Oil and Gas*, p.10, *available at* <https://s01.static-shell.com/content/dam/shell-new/local/country/usa/downloads/alaska/os101-ch4.pdf > (accessed June 21, 2015).

Currently, though *refined petroleum products* are carried on the Great Lakes, no *crude oil* is transported on Great Lakes vessels.[23] However, some believe this might be a possibility in the future as crude oil is already being shipped on the St. Lawrence River.[24] And, as noted later in this report, oil tankers carried crude oil from Superior, Wisconsin to Sarnia, Ontario in the early 1950s, before the Straits Pipelines were built.

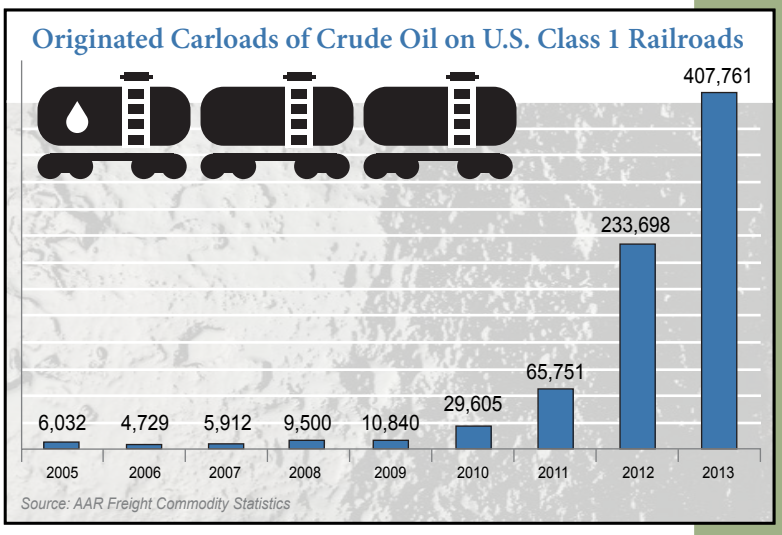
3. Petroleum Transportation by Tanker Truck

Approximately 4% of petroleum is transported by tanker truck. However trucks are generally used to carry refined petroleum products, though not oil, from refineries to retail outlets, and beyond. Trucks typically have capacities ranging from 5,500 to 11,600 gallons. At 42 gallons a barrel, this is only 130 to 275 barrels per load. Thus, though very convenient and flexible, it would take a massive number of trucks to equal the capacity of any of the other modes of transportation.

4. Petroleum Transportation by Rail

Though representing only approximately 3% of the oil transportation capacity in 2013, the increased production of domestic crude oil has made rail increasingly important to the U.S. petroleum industry. A rail tank car typically carries about 30,000 gallons of petroleum, or about 700 barrels, an increase of well over 4,000 percent.[25] In 2008, railroads originated 9,500 carloads of crude oil; in 2013, they originated 407,761 carloads.[26] And, in the first six months of 2014, the railroads had already originated close to 230,000 carloads.[27]

Rail has allowed crude oil production to surge by moving crude oil to markets where pipelines do not exist or are already at capacity. As noted earlier, the ability to recover crude from shale through hydraulic fracturing ("fracking") and horizontal drilling has opened new oil fields in North Dakota (the Bakken fields), Texas (Barnett), and Pennsylvania/Ohio (Marcellus). The huge increase in crude oil production in North Dakota has outpaced pipeline capacity. Because of their flexibility, railroads have stepped in to fill the gap in a very big way.



In addition, sometimes rail transport is faster than pipeline, *e.g.*, "a trip from the Bakken oil field to the U.S. Gulf Coast can take up to 40 days via pipeline versus five to seven days by rail."[28]

In summary, the railroad industry cites the following as advantages for transporting crude oil by rail: geographic flexibility, responsiveness, efficiency, underlying infrastructure, and product purity.[29]

23 The Great Lakes Commission, *supra.*
24 *Id.* at p. 23.
25 Conca, *supra.*
26 American Association of Railroads, *Moving Crude Oil by Rail* (September 2014), p.1, *available at* <https://www.aar.org/BackgroundPapers/Moving%20Crude%20Oil%20by%20Rail.pdf> (accessed June 21, 2015).
27 *Id.*
28 Great Lakes Commission, *supra* at p. 25.
29 *Id.* at pp. 4-5.

Risks and Examples of Spills while Transporting Petroleum and Petroleum Products

Whether transported by pipeline, water vessels, rail cars, or tanker truck, all modes of petroleum transportation present some risks to public safety and the environment.

There is no comprehensive, definitive study of the relative risks and impacts of the various modes of transport, and in particular no study that considers the substantial rise in shipments of crude by rail (from 5,000 carloads nationwide in 2006 to 400,000 carloads in 2013).[30] Comparing the hazards posed by the available transportation modes is complicated by the different risks and impacts associated with each – including risk to the environment, property, and human life. For example, the likelihood of an incident and the fatality rates are lower for pipelines and barges or tanker ships, but the volume of product released and the resulting environmental consequences from the releases can be greater than shipping modes that involve less volume, like tanker trucks.

1. Risks and Examples of Spills – Pipelines.

The extensive network of crude oil pipelines in the U.S. and several significant oil pipeline incidents in recent years highlight the risks and impacts associate with pipeline transport of crude. Notable examples include:

- Enbridge Energy Line 6B ruptured near Marshall, Michigan, on July 25, 2010, and discharged oil until July 26, 2010, when the line was shut down. The Line 6B incident released approximately 840,000 gallons (20,000 barrels) of oil into Talmadge Creek and the Kalamazoo River, and fouled 38 miles of river, banks and floodplains downstream of the rupture site, the largest inland oil spill in U.S. history. The National Transportation Safety Board found that in spite of pressure alarms and other signals of issues, Line 6B was restarted twice due to control room errors and failure to follow safety protocols.[31]
- In July 2011, an ExxonMobil pipeline running under the Yellowstone River failed during flood conditions. Over 42,000 gallons (1,000 barrels) of oil were released into the Yellowstone River and adjacent fields, pastures and lawns before the pipeline was closed.[32]
- In March 2013, another ExxonMobil pipeline ruptured in a residential area in Mayflower, Arkansas, this time releasing approximately 134,000 gallons (3,190 barrels) of Canadian heavy crude oil. The spill forced many residents to evacuate their home for an extended period of time.[33]
- In May 2015, a pipeline operated by Plains All American Pipeline LP ruptured and discharged approximately 105,000 gallons (2,500 barrels) of heavy crude onto land, beaches, and the ocean off the coast of Santa Barbara, California, resulting in the largest coast spill in California in 25 years.[34] Cleanup efforts are ongoing.

Each of these incidents, and the hundreds of other pipeline ruptures that have occurred throughout the U.S. pipeline system, have caused damage in varying degrees to the environment, as well as disruption to local residents and economies. Such widespread failures have increased public awareness of pipeline safety, and have drawn attention to the vulnerability of the Great Lakes to pipeline spills.[35]

30 American Association of Railroads, *supra*.
31 U.S. Environmental Protection Agency, *EPA's Response to the Enbridge Oil Spill, available at* <http://www.epa.gov/enbridgespill/> (accessed June 22, 2015).
32 U.S. Environmental Protection Agency, Yellowstone River Spill, *available at* <http://www.epa.gov/yellowstoneriverspill/> (accessed June 22, 2015).
33 U.S. Environmental Protection Agency, *U.S. Settles with ExxonMobil over Violations Stemming from 2013 Oil Spill in Mayflower, Arkansas* (April 25, 2015), *available at* <*http://yosemite.epa.gov/opa/admpress.nsf/0/9330c87e8d8e843e85257e2f0047fcd7*> (accessed June 22, 2015).
34 U.S. Environmental Protection Agency, *United States issues cleanup order to owner of ruptured Refugio Beach oil pipeline* (May 27, 2015), *available at* <http://yosemite.epa.gov/opa/admpress.nsf/0/5d83d41952e76a1b85257e52007cd488 (accessed June 22, 2015).
35 Great Lakes Commission, *supra.*

Of particular concern to Michigan in assessing the Enbridge 6B incident is the massive amount of heavy crude released, and the fact that eighty percent (80%) of the oil released into Michigan's environment resulted from human and systemic failures. In addition, the cleanup of the Line 6B spill was especially difficult due to the heavy crude oil (diluted bitumen/tar sands) that quickly sank below the water surface and eluded traditional oil-collection techniques.

2. Risks and Examples of Spills – Oil Tankers and Barges

As noted, one of the major advantages of water transport is the large volume that can be carried in a single trip. However, the combination of large volumes and open waters means that incidents involving tankers often cause large-scale environmental harm and are costly to clean up.[36] Examples of incidents involving crude tankers and vessels include:

- The 1989 grounding of the *Exxon Valdez* in Prince William Sound, Alaska, released almost 11 million gallons (257,000 barrels) into the sea and coastline.[37] The *Exxon Valdez* spill "is widely considered the number one spill worldwide in terms of damage to the environment. The timing of the spill, the remote and spectacular location, the thousands of miles of rugged and wild shoreline, and the abundance of wildlife in the region combined to make it an environmental disaster well beyond the scope of other spills."[38] This tragic incident served as the impetus for many new tanker safety regulations, and was the moving force behind the federal Oil Pollution Act of 1990.[39]

- In April 2003, an oil barge owned by the Bouchard Transportation Company struck rocks off the coast of Massachusetts at the entrance of Buzzards Bay. A 12-foot gash on the bottom of the hull released an estimated 98,000 gallons (2,333 barrels) of oil into the waters of Buzzards Bay and impacted more than 53 miles of shoreline.[40]

- A collision between a fuel oil barge towed by a tug and a cargo ship on March 22, 2014 in the Houston Ship Channel released 168,000 gallons (4,000 barrels) of oil into the waters of Galveston Bay; the spill drifted 200 miles down the Texas Gulf Coast.[41]

3. Risks and Examples of Spills – Tanker Trucks.

Since pipelines, trains and vessels all lack flexibility in delivering product, most petroleum products are eventually loaded onto a truck for short-distance hauls.[42] Truck transport can be risky. Accidents and spills are more likely than transport by train, pipeline, or boat. However, because the load per truck is relatively small (a typical tanker truck carries 8,400 – 9,000 gallons or 200-215 barrels) and because the trucks travel on land, the environmental impacts of spills are less. Petroleum tanker truck accidents are not uncommon, but do not receive a great deal of attention if they are quickly cleaned up with no loss to life and no lasting environmental impact. Below are a few illustrative Michigan examples:

36 Requirements of the federal Jones Act increase costs of tanker transport: vessels transporting cargo between two U.S. points must be built in the U.S., and crewed and owned by at least 75% U.S. citizens. A Jones Act-compliant tanker costs four times more than a foreign-built tanker, and as of Dec. 2014, only 10 Jones Act-eligible crude oil tankers are in use, all shipping between Alaska and the West Coast. CRS, *U.S. Rail Transportation of Crude Oil,* December 4, 2014.
37 *Exxon Valdez* Oil Spill Trustee Council, Questions and Answers, *available at* <http://www.evostc.state.ak.us/index.cfm?FA=facts.QA> (accessed June 22, 2015).
38 *Id.*
39 Great Lakes Commission, *supra* at p. 13.
40 Massachusetts Office of Energy and Environmental Affairs, *Buzzards Bay Bouchard Barge: #6 Fuel Oil Spill Shore Impacts, available at* <http://www.mass.gov/eea/agencies/massdep/cleanup/sites/buzzards-bay-bouchard-barge-6-fuel-oil-spill-shore.html> (accessed June 22, 2015).
41 ABC News, *NTSB Blames 2014 Ship Channel Collision Spill on Tugboat* (June 10, 2015), *available at* <http://abcnews.go.com/US/wireStory/ntsb-blames-2014-ship-channel-collision-spill-tugboat-31653530> (accessed June 22, 2015).
42 Conca, *supra.*

- In July 2009, a tanker truck traveling on I-75 north of Detroit crashed and exploded, causing a fire and the collapse of an overpass (9 Mile Road). Three people were injured. The truck lost about 12,000 gallons of fuel.[43]
- On March 11, 2015, a tanker truck exploded on I-94 in Detroit near the Dearborn border, closing portions of the highway for a week for repairs and cleanup. The tanker was carrying 13,000 gallons of fuel. Only minor injuries were reported.[44]
- On May 25, 2015, a Nour Light Petroleum Transport tanker truck carrying 9,000 gallons of unleaded fuel caught fire on the northbound I-75 bridge just outside downtown Detroit. Although some fuel flowed into the City of Detroit's sewer system, the water supply was not contaminated. Traffic was shut down in both directions for hours, but no injuries were reported. A damaged ramp remained closed for five days during repairs.[45]

4. Risks and Examples of Spills – Rail

The increase of rail transport of crude oil has resulted in increased rail accidents and releases of oil as well. In 2014, more than 141 "unintentional releases" were reported by the Pipeline and Hazardous Materials Safety Administration (PHMSA) - a record number of releases and a nearly six-fold increase over the average of 25 spills per year during the period from 1975 to 2012.[46] And in 2013, there were fewer accidents, but a much larger volume of spilled crude: 1.4 million gallons (33,333 barrels), an amount that exceeded the total for all spills since record keeping began in 1975. Of key concern is the ability of regulators to keep up with the increased crude oil transportation by rail. Rail oil-spill examples are included below.

- In July 2013, a train carrying 63 cars of crude oil from North Dakota was parked near the town of Lac-Megantic, Quebec, but the brakes were set improperly. The unmanned train began to roll and travelled over 7 miles, reaching a speed of 65 mph. As it approached the center of town, it derailed causing fires and explosions that destroyed 40 buildings and 53 vehicles, and killed 47 people. More than 1.5 million gallons (35,700 barrels) of oil were released.[47] The train operator, Montreal, Maine and Atlantic Railway, filed for bankruptcy within weeks of the disaster.
- Casselton, North Dakota, experienced a derailment and large explosion on December 30, 2013 when a BNSF (formerly known as the Burlington Northern and Santa Fe Railway) train carrying crude oil collided with a derailed BNSF train carrying grain. One year later, on November 13, 2014, two trains derailed only a mile from the site of the 2013 derailment, but fortunately the tank cars were empty and no explosion resulted.
- A 109-car CSX train carrying more than three million gallons (over 71,000 barrels) of Bakken oil from North Dakota derailed on February 16, 2015, near Mount Carbon, West Virginia, creating a giant fireball. Over 100 residents were evacuated from their homes. Fortunately, river water tests showed no signs of contamination.[48] The director of the West Virginia Water Research Institute (affiliated with West Virginia University and the U.S. Geological Survey) said the Bakken crude oil "has a lot of volatile compounds in it, things that are much more prone to explosion."[49]

43 Megha Satyanarayana, *Truckers Averted Worse Toll on I-94, Cops Say* (July 16, 2009) Detroit News, *available at* <http://www.freep.com/article/20090716/NEWS05/907160605/MDOT--9-Mile-bridge-can-t-be-salvaged> (accessed June 22, 2015).

44 CBS Detroit, *Fiery Tanker Crash, Explosion Shuts Down I-94 Near Detroit-Dearborn Border* (March 11, 2015), *available at* < http://detroit.cbslocal.com/2015/03/11/fiery-crash-explosion-shuts-down-i-94-near-detroit-dearborn-border/> (accessed June 22, 2015).

45 Katrease Stafford and JC Reindl, *Tanker explosion cuts off part of I-75 in Detroit,* Detroit Free Press (May 25, 2015), *available at* <http://www.freep.com/story/news/2015/05/24/tanker-explosion-detroit/27879251/> (accessed June 22, 2015).

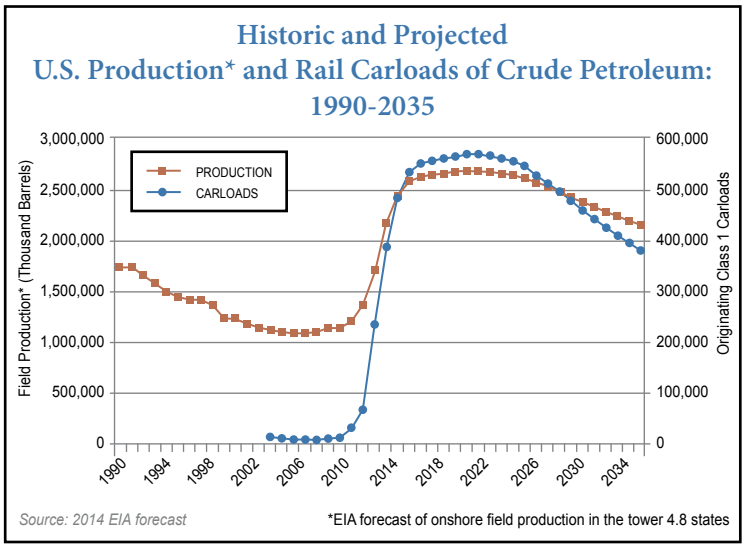
46 PHMSA data, as reported in the Washington Post, February 17, 2015, *available at* <*http://www.washingtonpost.com/news/energy-environment/wp/2015/02/17/trains-are-carrying-and-spilling-a-record-amount-of-oil/*> (accessed June 22, 2015).

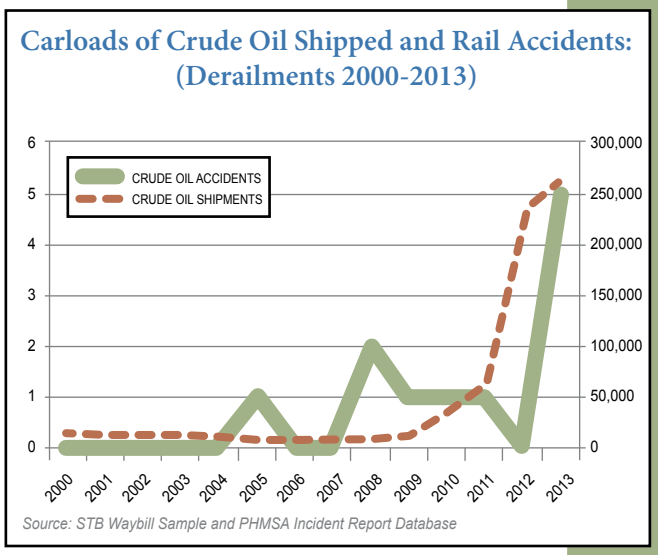
47 Transportation Safety Board of Canada, Railway Investigation R13D0054, *Runaway and Main Track Derailment. Montreal, Maine & Atlantic Railway Freight Train, MMA-002 Mile 0.23, Sherbrooke Subdivision, Lac-Megantic, Quebec.* 06 July 2013. <http://www.tsb.gc.ca/eng/rapports-reports/rail/2013/r13d0054/r13d0054.pdf> (accessed June 22, 2015).

48 Max Kutner, *West Virginia Begins Investigating Massive Train Derailment,* Newsweek (February 20, 2015). < http://www.newsweek.com/west-virginia-begins-investigating-massive-train-derailment-308428> (accessed June 22, 2015).

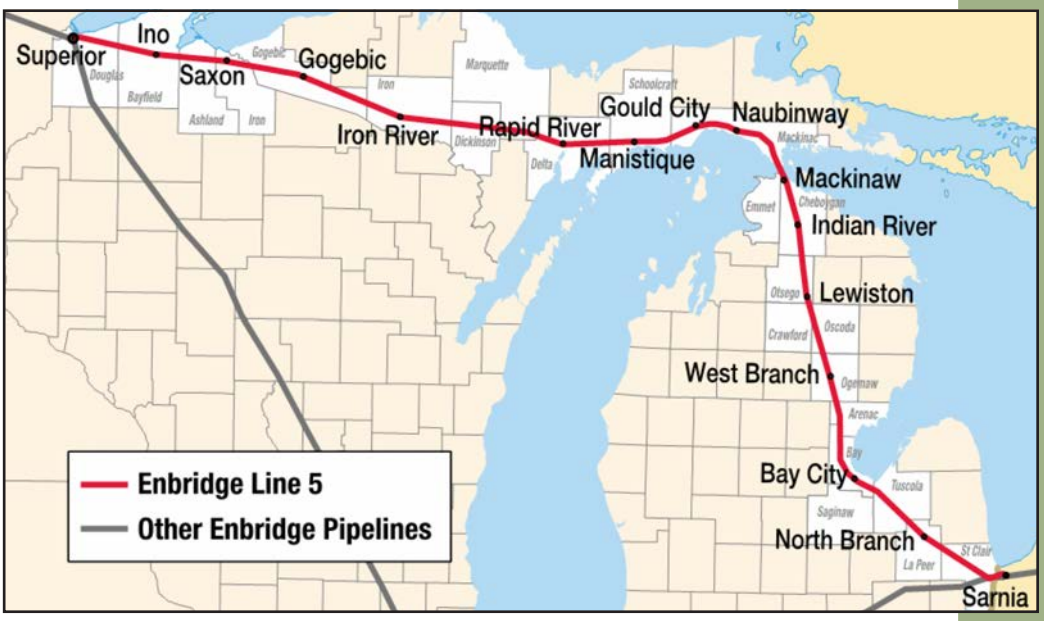
49 *Id.*

The following charts were included in the Proposed Rule published by PHMSA in the Federal Register on August 1, 2014.[50]





Enbridge Line 5 Pipelines at the Straits of Mackinac ("Straits Pipelines")



An increasing number of petroleum pipeline spills, and especially the massive 2010 release from Enbridge's Line 6B pipeline near Marshall Michigan, prompted public and governmental questions and concerns about other petroleum pipelines within the state. In particular, growing attention has focused on the portion of Enbridge's Line 5 pipeline system that is located literally in the waters of the Great Lakes, at the bottom of the Straits of Mackinac.

As discussed in greater detail in the Summary of Findings, in 1952, Enbridge's predecessor company, Lakehead Pipeline Company, proposed what is now called the Line 5 Pipeline. It was intended to transport crude oil produced in Canada from the end of another pipeline in Superior, Wisconsin, more than 600 miles, to petroleum refineries in Sarnia, Ontario. Line 5 was designed and constructed in 1953. The location of Line 5 is shown above. At the Straits of Mackinac, Line 5 is divided into two, parallel pipelines, each of which is 20 inches in diameter, and extends more than four miles across the lake bottom.

50 *Pipeline and Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains,* 79 F R 45016, (August 1, 2014) <http://www.gpo.gov/fdsys/pkg/FR-2014-08-01/pdf/2014-17764.pdf> (accessed June 22, 2015).

In March 1953, Lakehead obtained approval from the Michigan Public Service Commission to construct, operate, and maintain Line 5. Lakehead also convinced the Michigan Legislature to enact a new law, 1953 PA 10, that authorized the Conservation Commission (the predecessor of the present Department of Natural Resources) to grant easements across state-owned lands, including lake bottomlands, for the purpose of constructing, operating and maintaining pipelines and other public utilities. Under that authority, in April 1953, the Conservation Commission granted a Straits of Mackinac Pipeline Easement to Lakehead. As discussed below, the 1953 Easement authorized the construction, operation and maintenance of the Straits Pipelines on state-owned bottomlands, subject to specified terms and conditions.

More than sixty years later, the original Straits Pipelines remain in place, and according to Enbridge, transports up to 540,000 barrels of crude oil and natural gas liquids each day. The age of the Straits Pipelines, their location in a uniquely sensitive environment, the potential for environmental and economic harm if a spill were to occur, and Enbridge's systemic failure to prevent and control the 2010 spill from Line 6B, have all contributed to widespread concern about the Straits Pipelines. For example, The National Wildlife Federation highlighted those issues in its 2012 report entitled *Sunken Hazard: Aging Oil Pipelines beneath the Straits of Mackinac an Ever-Present Threat to the Great Lakes.*[51]

The State of Michigan, through the Attorney General and the Directors of the Departments of Environmental Quality and Natural Resources, has raised these same concerns directly with Enbridge. In a series of letters[52] beginning in April 2014, the State initiated an open dialogue with Enbridge about the Straits Pipelines and Enbridge's continuing obligations to the State under the terms and conditions of the 1953 Easement. This has included:

- An April 29, 2014 letter expressing concern about the Straits Pipelines and requesting that Enbridge respond to a series of specific questions and requests for information about various aspects of the Pipelines and documentation of Enbridge's compliance with the terms of the 1953 Easement.
- A June 27, 2014 response from Enbridge.
- A July 24, 2014 formal notice from the State to Enbridge that Enbridge had not fully complied with a condition of the Easement that the pipelines must be supported at least every 75 feet.
- A November 19, 2014 response from Enbridge.
- A March 12, 2015 letter to Enbridge requesting information about and documentation of Enbridge's financial assurance in a form acceptable to the State covering all liability imposed under the Easement including liability for all damages or losses to public or private property resulting from its operations at the Straits.
- An April 17, 2015 response from Enbridge.

It is important to note that each of these communications by the Attorney General and Department Directors were on behalf of the State, not the Task Force. They remain independent of the work of the Task Force. These efforts focused on protection of the State's legal, environmental, and natural resources interests related to Straits Pipelines and preceded the creation of the Task Force, continued in parallel with its work, and will continue, as needed, after completion of the Task Force's report.

51 *Available at* <http://www.nwf.org/pdf/Great-Lakes/NWF_SunkenHazard.pdf> (accessed June 22, 2015).
52 For copies of the Enbridge/State of Michigan correspondence, *see* Task Force Report Appendix B. 1-4, 7-8, *available at* <www.michigan.gov/pipelinetaskforce> (accessed July 9, 2015).

SUMMARY OF INFORMATION GATHERED

The Petroleum Pipeline Task Force met seven times between August 2014 and April 2015. At six of the meetings, formal presentations were made to the Task Force by outside organizations or individuals. In addition, Work Groups made up of agency staff met on a regular basis, gathered information on specific topics, and made recommendations to the Task Force. Additional materials were requested from Enbridge Energy, and the public was invited to submit comments and information. Finally, formal Consultations were held with Michigan's federally recognized Indian Tribes.

Presentations to the Task Force

Seven formal presentations were made to the Task Force. The main subjects covered and recommendations made by each presenting organization are briefly summarized below. Copies of the presentations are posted on the Task Force website.[53]

1. National Wildlife Federation - *Pipelines and Oil Transportation in the Great Lakes*[54]

The National Wildlife Federation presentation reviewed the network of petroleum pipelines in the Midwest, focusing on Enbridge's Lakehead System,[55] Line 5, and the Straits Pipelines. It highlighted the organization's concerns regarding:

- The age, condition, and supports for pipelines.
- Pipeline tests conducted by Enbridge.
- Enbridge's handling of "false alarms" in its pipeline monitoring system.
- The amount and location of resources available to respond to a worst-case oil discharge in the Straits of Mackinac.
- The results of a 2014 study by University of Michigan scientists simulating releases of oil from the Straits Pipelines under different scenarios (depending on the time of year and location of the release) and projecting the widespread movement of oil into Lake Huron, Lake Michigan, and the surrounding shorelines.[56]
- The consequences of the July 2010 release from Enbridge's Line 6B into Talmadge Creek and the Kalamazoo River.

Recommendations of the National Wildlife Federation:

- Require documentation of the integrity of the Straits Pipelines.
- Deploy procedures that shut down pipelines when there is an alarm until the alarm is investigated and cleared.

53 Michigan Petroleum Pipeline Task Force <http://www.michigan.gov/deq/0,4561,7-135-3306_69266---,00.html> (accessed June 15, 2015).
54 National Wildlife Federation, *Pipelines and oil transportation in the Great Lakes* Task Force Report Appendix C.1, *available at* <www.michigan.gov/pipelinetaskforce> (accessed July 9, 2015).
55 The Embridge Lakehead System is a 1,900-mile portion of the world's longest petroleum pipeline (stretching across Canada) and has been operational for more than 60 years. It serves all of the major refining centers in the Great Lakes, Midwest, and Ontario, Canada.
56 *See* David Schwab, *Research Report for the National Wildlife Federation Great Lakes Regional Center, available at* <http://graham.umich.edu/media/files/mackinac-report.pdf> *(accessed June 15, 2015); and* Erickson, *Straits of Mackinac 'worst possible place' for a Great Lakes oil spill, U-M researcher concludes, Michigan News, (July 10, 2014), available at* <http://ns.umich.edu/new/releases/22284-straits-of-mackinac-worst-possible-place-for-a-great-lakes-oil-spill-u-m-researcher-concludes> and videos depicting the projected spread of released oil are available at: <https://www.youtube.com/playlist?list=PLkpBjHvzRryqCzUAeLDxzgrRJOBbN-nBc> (accessed June 15, 2015).

- Release a schedule for maintenance and replacement of the Straits Pipelines.
- Increase oversight of the Straits Pipelines.
- Establish a protective standard for acceptable risk of pipeline failure.

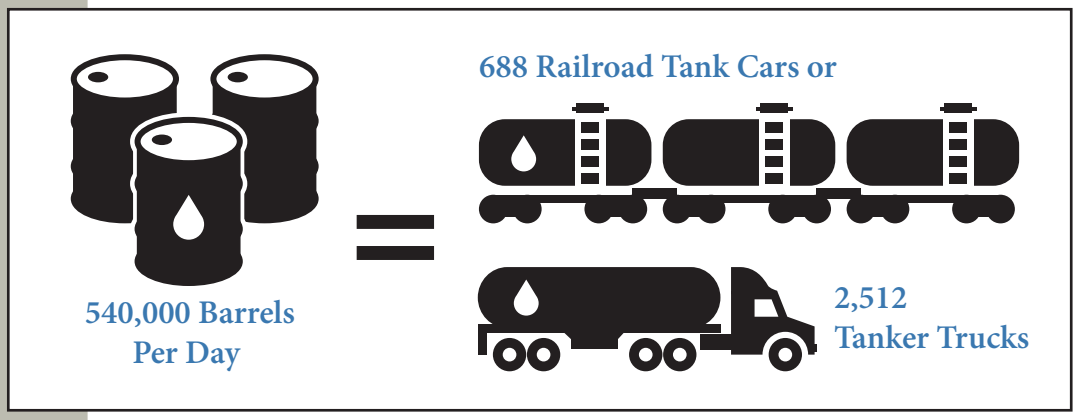
2. Enbridge Energy – Enbridge Operations in Northern Michigan - Line 5[57]

Enbridge Energy's presentation reviewed the company's network of facilities in Canada and the U.S., focusing on its petroleum liquids pipelines in Michigan, particularly Line 5 and the Straits Pipelines. Among other things, it emphasized:

- Line 5 transports light crude oil, light synthetic crude oil, and natural gas liquids from Superior, Wisconsin to Sarnia, Ontario (645 miles). The company specifically stated that it "[d]oes not transport heavy crude. Nor are there any plans to transport heavy crudes [through Line 5]."
- Enbridge's "number 1 priority is to operate safely and reliably" and its "goal [is] to build and maintain pipelines with ZERO releases."
- Safety measures in the Straits of Mackinac include the pipeline design, inspections, automatic shut-off valves, remotely operated isolation valves, new leak detection equipment, an electric back-up generator, and a valve yard containment system.
- Enbridge has been installing steel brackets to support the submerged Straits Pipelines since 2002.
- Enbridge has implemented various improvements to its pipeline integrity and safety program since 2010, including pipeline and facility integrity, leak detection, pipeline and control center operations, public awareness, emergency response, and safety culture.
- Enbridge performs internal inspections of the Straits Pipelines using electronic devices that move inside the pipelines and external inspections using underwater vehicles.

3. Pipeline and Hazardous Materials Safety Administration (PHMSA)[58]

The PHMSA presentation provided an overview of the network of pipelines regulated by PHMSA under federal law–including both natural gas transmission and hazardous liquids (including crude oil and refined petroleum products) pipelines. The presentation described PHMSA's mission of protecting people and the environment from the risks of transporting hazardous material by pipeline, and outlined the regulations it administers. Highlights of the information presented included:



- The capacity of Line 5 to transport up to 540,000 barrels per day is equivalent to the capacity of 688 railroad tank cars or 2,512 tanker trucks.

57 Enbridge Energy, Enbridge Operations in Northern Michigan, Line 5, Task Force Report Appendix, *supra* at C.2.

58 US Department of Transportation/Pipeline and Hazardous Materials Safety Administration's Office of Pipeline Safety, *Michigan Petroleum Pipeline Task Force*, Task Force Report Appendix, *supra* at C.3.

- The two largest percentage causes of "significant incidents" involving releases of hazardous liquids from pipelines nationwide between 1994 and 2013 were material, weld, or equipment failure (26.9%) and corrosion (24.3%).
- PHMSA does **not:** authorize or permit pipelines, approve pipeline siting or routing, monitor or track commodity shipments, establish spill cleanup criteria, or oversee cleanup operations.
- PHMSA administers two main sets of regulations involving oil pipeline safety:
    - *Transportation of Hazardous Liquids by Pipeline*, 49 CFR Part 195. These regulations address pipeline reporting, design, materials, construction, pressure testing, operations, maintenance, corrosion control, integrity management, operator qualification, public awareness, and damage prevention.
    - *Response Plans for Onshore Oil Pipelines,* 49 CFR Part 194. These regulations outline the required contents of spill response plans, provide for review and approval by PHMSA with opportunity for review and input by the U.S. Coast Guard and the U.S. Environmental Protection Agency (EPA). Plans must be resubmitted at least every 5 years, or when significant information changes.
- Briefly addressed the transport of diluted bitumen or "dilbit" in pipelines. Noted that a congressionally mandated study did not find any causes of pipeline failure unique to the transport of dilbit,[59] but also emphasized that the study did not consider or address the consequences of a dilbit release nor implications for response planning in dilbit spills.

4. Oil and Water Don't Mix Campaign – The State's Duty under Public Trust Law to Protect the Great Lakes from the Operation of the Line 5 Oil Pipelines in the Straits[60]

This was a joint presentation by representatives of the Michigan Land Use Institute, FLOW (For Love of Water), and the Michigan Environmental Council on behalf of a coalition of civic, public and business interests concerned about the Straits Pipelines (Oil & Water Don't Mix Campaign).[61] The presentation urged the State to take action to ensure the public's rights and uses of the Great Lakes under the Public Trust Doctrine are protected from impairment by operation of the Straits Pipelines. Among other things, the presentation asserted that:

- Under Public Trust law, certain resources, including the Great Lakes and their bottomlands are held in trust by the State for the benefit of the public. The State has a perpetual duty to protect those resources and the public's right to use them for activities such as navigation, fishing, etc. from substantial harm or impairment.
- The Straits Pipelines were placed on state-owned bottomlands, subject to the terms of the 1953 Easement, granted under state law.[62]
- Under the Easement, the "Grantee…at all times shall exercise the due care of a **reasonably prudent person** for the safety and welfare of all persons and of all public and private property."
- The 2010 Enbridge Line 6B spill and its effects, the 2014 University of Michigan study of the potential effects of a spill from the Straits Pipelines, and the special challenges of trying to respond to a spill under ice at the Straits all illustrate risks to the public trust presented by operation of the Straits Pipelines.

59 Transportation Research Board Special Report 311 (2013), *Effects of Diluted Bitumen on Crude Oil Transportation Pipelines, available at* <http://onlinepubs.trb.org/onlinepubs/sr/sr311.pdf> (accessed June 15, 2015).
60 Oil & Water Don't Mix Campaign, *The State's Duty under Public Trust Law to Protect the Great Lakes from the Operation of Line 5 Oil Pipelines in the Straits,* Task Force Report Appendix, *supra* at C.4.
61 *See* <http://www.oilandwaterdontmix.org> (accessed June 15, 2015).
62 The Easement was granted under 1953 Public Act 10, now MCL 324.2129, *available at* <http://legislature.mi.gov/doc.aspx?mcl-324-2129> (accessed June 15, 2015).

- The Great Lakes Submerged Lands Act[63] regulates activities on Great Lakes bottomlands. It was enacted in 1955, later amended several times, and is now codified as Part 325 of the Natural Resources and Environmental Protection Act. Enbridge applied for and the MDEQ issued permits under Part 325 authorizing the installation of new support brackets for the Straits Pipelines.
- Part 325 provides a formal legal process subject to public comment and judicial review. Part 325 rules also require consideration of alternatives.

Recommendations of the Oil and Water Don't Mix Campaign included:

- The State should require Enbridge to apply for a permit or other new authorization under Part 325 as a condition of the continued operation of the Straits Pipelines.
- Enbridge should be required to show that the pipelines will neither substantially affect the public use nor impair the public trust and that Enbridge is taking all reasonable steps to protect public uses.
- The review should be ongoing and formally reviewed under Part 325.

5. Great Lakes Commission – Transportation of Crude Oil in the Great Lakes - St. Lawrence River Region[64]

The presentation by the Executive Director of the Great Lakes Commission outlined the nature of the Commission and its activities in recent years involving oil spill preparedness and emergency response as well as studies of oil transportation in the Great Lakes region.

- The Great Lakes Commission is an interstate compact agency established by the 1955 Great Lakes Compact. It includes the states of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin. The provinces of Ontario and Quebec joined in 1999 as associate members.
- Since 1989, the Commission has developed various programs and reports related to oil spill preparedness and response.[65]
- In September 2014, the Commission staff presented a discussion draft summary report[66] on crude oil transportation in the Great Lakes region. The final report will be presented at the September 2015 Commission meeting.
- Among other things, the report outlines the rail and pipeline networks used for oil transportation in the region.
- Key findings of the report include:
    - There has been a tremendous increase in oil production and movement.
    - Risks of petroleum transportation are complex and hard to evaluate and compare between transportation modes.
    - Infrastructure issues are a concern, especially for pipeline and rail transport. Currently, increases in oil production and transportation (especially by rail) are outpacing regulatory, inspection, and enforcement programs.

63 The MCL 325.32501 *et seq*. *Available at* <http://legislature.mi.gov/doc.aspx?mcl-451-1994-III-1-THE-GREAT-LAKES-325> (accessed June 15, 2015).
64 Great Lakes Commission, *Transportation of Crude Oil in the Great Lakes – St. Lawrence River region,* Task Force Report Appendix, *supra* at C.5.
65 See, e.g., *Emergency Preparedness and Response Programs Report (2012), available at* <http://glc.org/files/main/news/FINAL-EmergencyPreparednessTaskForceReport-Sept2012.pdf> (accessed June 15, 2015).
66 Great Lakes Commission, *Issues and Trends Surrounding the Movement of Crude Oil in the Great Lakes-St. Lawrence River Region*, *supra.*

- Mechanisms for communication, coordination, and spill notification between jurisdictions exist, but must be strengthened.
- Response technologies for heavy crude oil spills in open freshwater are lacking.
- Although *refined petroleum* products are transported on the Great Lakes, there is currently no *crude oil* transported by vessel on the Great Lakes.
- Office of Pipeline Safety (OPS) implements pipeline design, construction, operation, maintenance, and spill-response planning provisions.
- PHMSA is the only agency authorized to prescribe safety standards for interstate pipelines, but does not control their location or routing.
- States may select pipeline routes within their state.
- Illinois, Michigan, and Minnesota require permits for new pipeline construction.
- States may oversee intrastate regulation, inspection, and enforcement responsibilities under an annual certification issued by PHMSA – currently, Indiana, Minnesota, and New York have certified programs.

6. Marathon Petroleum Company – *MPC Michigan Crude Oil and Transportation Fuel Supply*[67]

In its presentation, Marathon Petroleum Company (the operator of the only crude oil refinery in Michigan) provided an overview of its operations and crude oil transportation in the vicinity of the Detroit and Toledo refineries. The presentation included

- Maps of crude oil pipelines and refineries;
- Maps of crude oil by rail supply routes and refinery demand;
- Maps of crude oil by truck supply routes; and
- An overview of Marathon's integrated product supply network and its fuel refining supply chain.

Marathon made it clear that pipelines were an essential source of crude oil for their Detroit refinery

7. Ken Winter and Dr. James Hill – *The Straits of Mackinac Pipelines: A Market Perspective*[68]

This presentation by Dr. James Hill of Central Michigan University was based on a research project on pipeline safety authored by a graduate student, Mr. Ken Winter, another graduate student and two undergraduate students. It proposes the use of "market forces and …legally binding agreements" to "guide [Enbridge's] decisions on the use, maintenance, and operation" of the Straits Pipelines. The presentation stated:

- The risk of a spill from the Straits Pipelines must be taken seriously, notwithstanding Enbridge's public assurances regarding the safety of Line 5.
- Enbridge, as the owner and operator of the Pipelines, is in the best position to prevent a spill.
- There is an information gap about the magnitude and full environmental and economic costs of a worst-case spill scenario.

67 Marathon Petroleum Company, *MPC Michigan Crude Oil and Transportation Fuel Supply (2014),* Task Force Report Appendix, *supra* at C.6.
68 Ken Winter and James Hill, *The Straits of Mackinac Pipelines: A Market Perspective* (February 9, 2015), Task Force Report Appendix, *supra* at C.7. *See also* Ken Winter and James Hill, *Dire Straits – Pipelines and Policy Options for the Great Lakes* (October 24, 2014), *available at* <http://www.michigan.gov/documents/deq/deq-winter-hill-pipeline-policy_481051_7.pdf?20150615141559> (accessed June 15, 2015).

- That information is needed by Enbridge corporate decision makers to make an economically rational risk-benefit analysis of whether, and under what conditions, to continue to operate the pipelines.
- The state should fund an economic and environmental assessment of the consequences of a worst-case spill from the pipelines. The study should be conducted by independent and unbiased experts who have no ties to pipeline owners or other organizations with a vested interest in the outcome of the study.
- This independent assessment could also be used to establish new insurance and surety requirements beyond the $1 million minimum specified in the 1953 Easement as needed to cover the full liability imposed on Enbridge.
- Enbridge should enter into a new legally binding agreement with the state to pay for all direct and indirect costs resulting from a spill from the pipelines and be solely responsible for all upfront payments.
- In November 2014, an Enbridge executive stated that it would not be cost effective to maintain more than $700 million in aggregate environmental damage insurance.
- Given the approximately $1 billion cost of the 2010 Line 6B releases clean up and the potential for multiple spills on its extensive, aging pipeline network, Enbridge should be required to demonstrate its financial ability to handle more than a single spill at a time. Enbridge should be required to establish a surety or a contingency fund (funded by annual corporate payments) sufficient to handle the possibility of more than one major spill in a short period of time.

Information Gathered through Work Groups

Work Groups included staff from each of the state agencies represented on the Task Force. As outlined below, the Work Groups focused on (1) pipeline siting and regulation, (2) emergency planning and spill response for pipelines, and (3) public awareness. The Work Groups collected information from a variety of sources, including federal and state agencies, nongovernmental organizations, and industry sources. Information was presented to Task Force members and, where adopted by the Task Force, is reflected in the Summary of Findings and Recommendations sections of this Report.

1. Existing Petroleum Pipelines and Pipeline Maps

One Work Group reviewed currently available maps maintained by the Michigan Public Service Commission for crude oil pipelines[69] and refined petroleum product pipelines[70] in Michigan, as well as information from PHMSA, including its pipeline mapping website[71] and other PHMSA resources available to regulatory agencies. It also compared pipeline-mapping information used by various state agencies, including the Michigan State Police, with those used by federal agencies for emergency and spill response planning.

69 Michigan Public Service Commission, Michigan Oil Pipe Line Map, *available at* <http://www.dleg.state.mi.us/mpsc/gas/img/crudepipelinesmap.pdf> (accessed June 15, 2015).
70 Michigan Public Service Commission, Petroleum Product Pipelines in Michigan Map, *available at* <http://www.dleg.state.mi.us/mpsc/gas/download/mipetmap.pdf> (accessed June 17, 2015).
71 Pipeline Hazardous Materials and Safety Administration, National Pipeline Mapping System, *available at* <https://www.npms.phmsa.dot.gov/PublicViewer/> (accessed June 15, 2015).

2. Siting and Regulating Pipelines

The Work Group also reviewed the existing legal framework for siting new petroleum transportation pipelines and for regulating the design, operation and safety of pipelines, as well as requirements for reporting spills and developing plans for responding to them.

a. Pipeline Siting

The Work Group reviewed current Michigan laws and procedures under which the Michigan Public Service Commission reviews applications to construct new petroleum pipelines.[72] It compared those laws and procedures to those used by several other states, including states in the Great Lakes region.

b. Pipeline Regulation, Spill Reporting and Response Plan Approval

The Work Group reviewed relevant federal and state laws, including:

- The primary role of PHMSA, under federal law, in regulating the design, construction, operation and maintenance of petroleum pipelines.
- Opportunities under federal law for states to develop their own programs to regulate hazardous liquid (including petroleum) pipelines, and to seek PHMSA certification to (a) regulate intrastate pipelines and (b) participate in oversight of interstate pipelines.
- The opportunities for states, within the framework of the federal Oil Pollution Act of 1990,[73] to impose their own requirements for reporting oil spills and approving oil spill response plans.
- The comparison of Michigan and federal civil fines for oil spills into water.

The Work Group also considered information available from nongovernmental advocacy organizations, including a report issued by the National Wildlife Federation[74] and a presentation to the Work Group by the Pipeline Safety Trust, an independent, non-profit organization providing information and advocacy for pipeline safety.[75]

3. Emergency Planning and Spill Response

A second Work Group focused on emergency notification processes and response procedures relevant to petroleum pipelines in Michigan. It considered, among other things:

- Existing disaster-specific procedures for hazardous materials incidents outlined in the Michigan Emergency Management Plan.
- Additional response plans developed by the Departments of State Police, Environmental Quality, Natural Resources, and Transportation, with specific roles and responsibilities regarding petroleum pipeline and hazardous materials emergencies.
- The need for pipeline operators to demonstrate adequate response plans and capabilities to the state.
- Procedures for notifying state agencies of spills.
- Coordination and information sharing among local, state, federal, and tribal agencies.
- Spill response training and exercises.

72 *See* Michigan Public Service Commission, *Petroleum Pipeline Siting, available at* <http://www.dleg.state.mi.us/mpsc/petroleum/petpipes.htm> (accessed June 15, 2015).
73 33 USC 2701 *et seq.*
74 Sara Gosman, *After the Marshall Spill: Oil Pipelines in the Great Lakes Region, a Legal Analysis by the National Wildlife Federation* (2012), *available at* <https://www.nwf.org/pdf/Tar-Sands/Oil_Pipelines_in_the_Great_Lakes_Region_Report_v3_(2).pdf> (accessed June 15, 2015).
75 Task Force Report Appendix, *supra* at D.1.

Information from Enbridge

Following Enbridge's presentation, the Task Force asked the company a series of follow-up questions by way of a letter dated January 16, 2015. Enbridge responded on February 27, 2015.[76] Both letters are included at the Task Force website. The questions focused primarily on the Straits Pipelines and involved, among other topics:

- The materials and design of the existing Straits Pipelines and the design of a hypothetical replacement pipeline.
- The nature and timing of inspections.
- Decision criteria for pipeline repair or replacement.
- The operation of automatic shut-off valves.
- Estimated costs of a worst-case scenario release from the Straits Pipelines.
- Spill response during a period of ice cover.
- The risk of anchor strikes to the Straits Pipelines.
- Past, present, or future transportation of "tar sands" or heavy crude through Line 5.

As noted earlier, independent of the Task Force, the State of Michigan, through the Attorney General and the Directors of the Departments of Environmental Quality and Natural Resources, had previously requested detailed information from Enbridge concerning the Straits Pipelines and compliance with the terms and conditions of the 1953 Easement.

Tribal Consultations

The State, including representatives of agencies on the Task Force, has consulted with federally recognized Indian Tribes in Michigan concerning the work of the Task Force and the Straits Pipelines. These consultations took place in February, May, and June of 2015 and included the following Tribes and tribal organizations:

- Bay Mills Indian Community
- Chippewa Ottawa Resource Authority (CORA) (representing five Tribes party to the 1836 Treaty regarding the Tribes commercial and subsistence fisheries in the waters of Lakes Huron, Michigan and Superior ceded in the treaty)
- Grand Traverse Band of Ottawa and Chippewa Indians
- Hannahville Indian Community
- Keweenaw Bay Indian Community
- Little River Band of Ottawa Indians
- Little Traverse Bay Bands of Odawa Indians
- Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians
- Nottawaseppi Huron Band of the Potawatomi Indians
- Pokagon Band of Potawatomi Indians
- Sault Ste. Marie Tribe of Chippewa Indians
- Saginaw Chippewa Indian Tribe

76 *Id.* at B.5-6.

In addition to the oral statements by the Tribes during the consultations, several of the Tribes provided written communications, including formal resolutions adopted by the respective tribal governments. Copies of those written communications are included on the Task Force website.[77]

The Tribes participating in the consultations expressed numerous concerns and made various recommendations regarding oil pipelines generally and the Straits Pipelines in particular. Examples of the concerns and recommendations made by the Tribes included:

- Each of the Tribes expressed grave concern about the potential for releases from the Straits Pipelines, emphasizing the age and critical location of the Pipelines, as well as Enbridge's Line 6B spill.
- Each of the Tribes indicated that a release of oil from the Straits Pipelines could have a devastating impact on the ecosystem, particularly the fishery resources of Lakes Huron and Michigan and, where applicable, tribal fishing rights reserved by treaty.
- Several of the Tribes expressed particular concern about the possible transportation of diluted bitumen or other heavy crude oil through Line 5 or elsewhere in the Great Lakes and recommended that such transportation be prohibited.
- Some Tribes recommended that the Straits Pipelines be safely decommissioned and removed as soon as possible.
- Some Tribes recommended that there should be a comprehensive analysis of alternatives to the Straits Pipelines, adequate financial assurance for its operation, and that additional information be made available to the public.
- Some Tribes recommended that the State more fully develop and exercise legal authority to regulate oil pipelines in order to protect the public trust.

Public Comments and Correspondence

The Task Force received numerous comments from the public, principally through emails and submissions on the Task Force website.[78] The principal topics addressed in the comments included the following:

- Virtually every comment received expressed strong concern about the possibility of releases from the Straits Pipelines.
- Most of the comments said, frequently in almost identical terms, that Line 5 under the Straits of Mackinac should be shut down.
- Some of the comments expressed concern about the possibility of transporting heavy crude through the Straits Pipelines and said that it should be prohibited.
- Some of the comments recommended that, at a minimum, the existing Straits Pipelines should be improved, upgraded, or replaced.
- Some of the comments recommended that the State impose a large tax on oil transported from Canada through the Straits Pipelines.

77 *Id.* at E.1-8.
78 *Id.* at F.2-3.

The Task Force also received correspondence from FLOW, dated April 30, 2015, transmitting a "Composite Summary of Expert Comment, Findings, and Opinions on Enbridge's Line 5 Oil Pipeline in the Straits of Mackinac in Lake Michigan."[79] That submission is included in the Appendix on the Task Force website. FLOW's Composite Summary reiterated many of the views expressed in its previous presentation to the Task Force, particularly its recommendation that Enbridge should be required to initiate a formal legal proceeding under Part 325 to obtain authorization for continued operation of the Straits Pipelines. The Composite Summary added additional information compiled by individuals identified as experts in hazardous materials management, chemistry, and engineering. Topics addressed in the Composite Summary included, but were not limited to the following:

- Additional information must be obtained and made publicly available before an informed decision can be made about the future operation of the Straits Pipelines:
    - The existing and forecasted future strategy for transporting oil and the role of Line 5 under normal operating conditions and in the event of disruptions in the system.
    - A comprehensive alternatives analysis assessment, including comparison to a state of the art pipeline.
    - A detailed assessment of the consequences of a worst-case spill.
- More information is needed to assess the safety of the existing pipelines because of changes in circumstances since 1953. These include, among other things:
    - The fact that the submerged Pipelines are now encrusted with invasive mussels that may place stresses on the Pipelines and promote corrosion.
    - The welding techniques used for the pipelines in 1953 are out-of-date.

79 *Id.* at F-1.

SUMMARY OF FINDINGS

Based on the information gathered and reviewed by the Task Force and Work Group members, a series of findings were made. These findings were divided into two categories: (1) those findings that related to petroleum pipelines throughout the state (Statewide Issues), and (2) those findings that specifically related to the Straits Pipelines (Straits Pipelines Issues).

Statewide Issues

Existing Petroleum Pipelines in Michigan

As of 2014, Michigan contained 2,855 miles of interstate hazardous liquid pipelines and 425 miles of hazardous liquid intrastate pipelines.[80] The hazardous liquid commodities transported by pipeline in Michigan are classified into three different PHMSA-defined categories: crude oil, highly volatile liquids, and refined petroleum products.

Petroleum Pipelines in Michigan			
Commodity	**Interstate Mile**	**Intrastate Miles**	**Total Miles**
Crude Oil	1,236.0	156.6	1,392.6
Highly Volatile Liquids	277.4	269.0	546.4
Refined Product	1,341.0	0.3	1,341.2

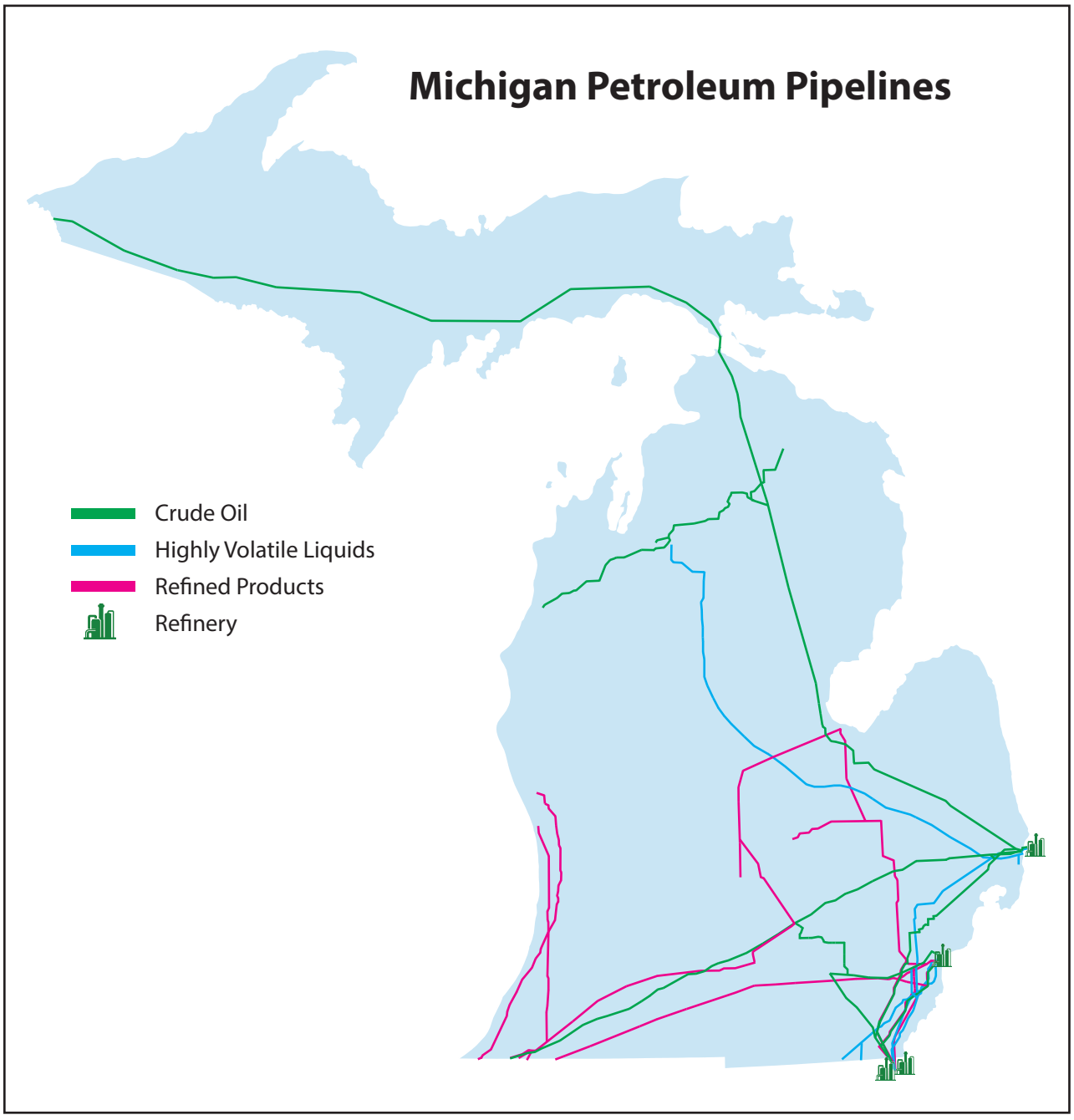
The interstate pipelines located in Michigan are operated by:

1. Buckeye Partners, LP (refined petroleum products)
2. Marathon Pipe Line, LLC (crude oil)
3. Wolverine Pipeline Co. (refined petroleum products)
4. Enbridge Energy, L.P. (crude oil)
5. Enbridge Pipelines (Toledo), Inc. (crude oil)
6. Sunoco Pipeline, L.P. (refined petroleum products)
7. Mid-Valley Pipeline Co. (crude oil)
8. Marathon Pipe Line, LLC (refined petroleum products)
9. Sunoco Pipeline, LP (highly volatile liquids)
10. Plains Marketing, LP (highly volatile liquids)
11. Buckeye Development & Logistics, LLC (highly volatile liquids)
12. Kinder Morgan Cochin, LLC (highly volatile liquids)
13. Amoco Oil Co. (refined petroleum products)

80 Information related to pipeline mileage and accidents is available on the Pipeline and Hazardous Materials Safety Administration's website. <http://primis.phmsa.dot.gov/comm/Index.htm?nocache=4960> (accessed June 16, 2015).

The intrastate pipelines are operated by:

1. Markwest Michigan Pipeline, LLC (crude oil)
2. DCP Midstream (highly volatile liquids)
3. Merit Energy Company (highly volatile liquids)
4. Marathon Pipe Line, LLC (highly volatile liquids)
5. Nova Chemicals (Canada), Ltd (highly volatile liquids)
6. Citgo Petroleum Corporation (Terminals) (refined petroleum products)



Pipelines Transporting Crude Oil and Petroleum Products[81]

81 Prepared by the Michigan Public Service Commission using PSC historic documents and updated for this report using the National Pipeline Mapping System to only include in-service pipelines.

Regulatory Framework

1. Siting Pipelines

Decisions regarding *where* hazardous liquid pipelines, including petroleum pipelines, are located are made at the state level.

a. Current Michigan Laws and Regulations:

Under Michigan law, 1929 PA 16 ("Act 16"),[82] the Public Service Commission (PSC) must approve the location of any crude oil or petroleum transportation pipeline constructed in Michigan, whether it is wholly intrastate or a portion of an interstate pipeline (except for private trunk or gathering pipelines).[83]

Act 16 broadly grants the PSC "the power to control, investigate, and regulate a person . . . (c) engaging in the business of piping, transporting or storing crude oil or petroleum, or any of the products thereof, or carbon dioxide substances within this state."[84] The statute also authorizes the PSC to "make all rules, regulations and orders necessary to give effect and enforce [Act 16]."[85]

The only administrative rule promulgated on this subject, recently re-codified as Mich Admin Code, R 792.10447, briefly describes the content of an application for authority to construct the proposed pipeline. The minimal requirements include the name and address of the applicant, the local unit of government affected, the nature of the utility service to be furnished, the franchise or consent from the local government if required, "a full description of the proposed new construction or extension, including the manner in which it will be constructed," and the names and locations of competing utilities.[86]

Notably, neither the statute nor the rule prescribes any further detail for the application content or the criteria to be used by the PSC in making its decision. For example, there is no express requirement to consider potential alternative routes, or impacts to public safety, natural resources, or the environment. And while other state agencies can, and sometimes do provide informal input, nothing in the Act nor the rule requires the PSC to coordinate with, or invite comment from, other state agencies such as the Departments of Environmental Quality, Natural Resources, Agriculture & Rural Development, or Transportation.

Although Act 16 separately requires (a) a person conducting survey work for a proposed pipeline to provide notice to the property owner and (b) a person requesting a pipeline easement to provide the property owner with certain information,[87] Act 16 does not require the applicant itself to provide any additional public notice or information to persons located along the proposed route before or during the application process. As a matter of practice, in cases where the applicant has not yet acquired all rights-of-way for the pipeline route, PSC staff requests that the applicant hold public meetings for people located in the proposed pipeline path.

Filing an application with the PSC triggers a formal administrative hearing, which is typically conducted as a contested case (trial-like) proceeding before an administrative law judge. In addition to the applicant, interested persons may provide written comments to intervene in the proceeding. The PSC's administrative practice requires the applicant to provide notices of the contested case hearing to cities, villages, townships, and counties which may be traversed by the proposed pipeline. The PSC also requires that notice be given to each landowner on the pipeline route from whom the applicant has not acquired property rights for the pipeline. PSC staff typically participate in these hearings as well. Upon completion of the hearing,

82 MCL 483.1 *et seq.*
83 Under Act 16, the Public Service Commission must similarly approve the location of *intrastate* natural gas pipelines, but not interstate gas pipelines. The Federal Energy Regulatory Commission regulates the location of *interstate* gas pipelines under federal law.
84 MCL 483.3.
85 MCL 483.8.
86 Mich Admin Code, R 792.10447(2).
87 MCL 483.2a, *available at* <http://legislature.mi.gov/doc.aspx?mcl-483-2a> (accessed June 16, 2015).

a record is compiled, which includes written testimony, exhibits, and a transcript of any cross-examination of witnesses. The administrative law judge may then prepare a Proposal for Decision recommending the action to be taken by the PSC. Alternatively, the PSC may itself read the record and directly make its decision, which is published in a written Order.

In the absence of any decision-making standards in Act 16 or the rule, the PSC relies upon its "broad jurisdiction to approve the construction, maintenance, operation, and routing of pipelines delivering liquid petroleum products for public use. Generally, the [PSC] will grant an application pursuant to Act 16 when it finds that (1) the applicant has demonstrated a public need for the proposed pipeline, (2) the proposed pipeline is designed and routed in a reasonable manner, and (3) the construction of the pipeline will meet or exceed current safety and engineering standards."[88]

There are two ways the pipeline operator may obtain the legal right to use property for the construction and maintenance of a petroleum pipeline. First, it may negotiate an easement agreement with the property owner. Alternatively, if that is unsuccessful, a PSC order approving the pipeline constitutes a legal determination that the pipeline is necessary, and thus enables the pipeline operator to condemn the needed property through eminent domain.[89] The condemnation action must follow the procedures of the Uniform Condemnation Procedures Act,[90] including the payment of fair compensation for the property taken.

b. Siting Pipelines on State-Owned Land

In addition to requiring PSC approval for pipeline construction under Act 16, the legislature provided a mechanism for locating pipelines on state-owned land. In 1953, when what is now Enbridge's Line 5 was proposed, Michigan enacted 1953 Public Act 10 which authorized the Conservation Commission (the predecessor of the current Department of Natural Resources) to grant easements for placement of pipelines across state-owned lands, including lake bottomlands. The statute, codified as MCL 324.2129,[91] now provides in part:

> The department *may grant easements, upon terms and conditions the department determines just and reasonable*, for state and county roads and *for the purpose of constructing, erecting, laying, maintaining, and operating pipelines*, electric lines, telecommunication systems, and facilities for the intake, transportation, and discharge of water, including pipes, conduits, tubes, and structures usable in connection with the lines, telecommunication systems, and facilities, over, through, under, and upon any and all lands belonging to the state which are under the jurisdiction of the department and over, through, under, and upon any and all of the unpatented overflowed lands, made lands, and *lake bottomlands belonging to or held in trust by this state*. (Emphasis added)

As discussed earlier in this Report, the Conservation Commission used this authority to grant the 1953 Straits Pipeline Easement.

c. Comparison to Pipeline Siting Processes in Other States:

In reviewing Michigan's processes for determining the routing of new petroleum pipelines, it is useful to compare them to the approaches taken by two other states in the Great Lakes region: Illinois and Minnesota.

88 *See e.g., In re Application of Enbridge Energy, Limited Partnership*, order of the Public Service Commission, entered January 31, 2013 (Case No. U-17020), p. 5, (approving application by Enbridge Energy to construct and operate new pipeline segments to replace portions of Line 6B) *available at* <http://efile.mpsc.state.mi.us/efile/docs/17020/0209.pdf> (accessed June 16, 2015).
89 MCL 480.2.
90 1980 PA 87, MCL 213.51 to MCL 213.75.
91 *Available at* <http://legislature.mi.gov/doc.aspx?mcl-324-2129> (accessed June 16, 2015).

1) Illinois

In Illinois, like in Michigan, the agency charged with regulation of public utilities (in Illinois, the Illinois Commerce Commission, or ICC) administers a statute (Common Carriers by Pipeline Law)[92] that requires state approval of the construction and operation of a pipeline used to carry crude oil or petroleum.

Under this statute, after a hearing, the ICC may approve the proposed pipeline if it finds that the application was properly filed, a public need for the service exists, that the applicant is fit, willing, and able to provide the service, and that public convenience and necessity requires issuance of the approval.

The statute allows the ICC to consider the public convenience and necessity of the proposed pipeline "and *any alternate locations for such proposed pipeline*." Sec 15-401 (Emphasis added).

In addition, the statute requires the ICC to consider any evidence from other state agencies or persons on several other specific factors, including: (1) any evidence presented by the Illinois EPA regarding the *environmental impact* of the proposed pipeline, (2) any evidence presented by the Illinois DOT regarding *impact on roads and transportation* issues, (3) any evidence presented by the Illinois DNR regarding *impacts on natural resources*, (4) any evidence presented by local governments regarding the *impact on local economy and infrastructure*, (5) any evidence presented regarding the *impact on property values* presented by affected property owners, (6) any evidence presented by other agencies or persons regarding the economic impact/effects of the proposed pipeline, and (7) any evidence presented by any State or federal entity as to how the proposed pipeline will affect the security, stability, and reliability of energy in the state or region. (Emphasis added)

The Illinois statute also requires that, under the ICC's rules, notice of the proceeding be provided to landowners along the proposed pipeline route or potentially affected landowners. Sec 15-401-d.

2) Minnesota

Minnesota has adopted statutes and detailed rules and regulations that comprehensively govern the processes followed by the Minnesota Public Utilities Commission (MPUC) in issuing routing permits for new petroleum, crude oil, and intrastate natural gas pipelines.[93]

Under Minnesota statute and rules, when a permit application is accepted for processing by the MPUC, notice must first be given to the public of the proposal, and the procedures to be followed, including initial public information meetings in each county along the proposed route. Citizen advisory committees may also be established. Both MPUC staff and advisory committees may propose alternate routes to be considered by the MPUC.

The permit applicant must provide detailed information concerning the proposed project, including the pipeline design and specifications, descriptions of the capacity and the product(s) to be transported, the land required, the preferred route, other route locations considered, an analysis of the human and environmental impact of the preferred route, right of way protection and mitigation measures, a description of all required permits, and an analysis of alternative routes.[94]

The MPUC makes its decision after a formal administrative hearing during which evidence is presented by the applicant, staff, and other interested parties who participate in the hearing.[95]

92 220 ILCS 5/15-100 *et seq*, *available at* <http://www.ilga.gov/legislation/ilcs/ilcs4.asp?DocName=022000050HArt%2E+XV&ActID=1277&ChapterID=23&SeqStart=34000000&SeqEnd=35800000> (accessed June 16, 2015).

93 The statute governing pipelines in Minnesota is Chapter 216 of Minnesota Statutes, *available at* <https://www.revisor.mn.gov/statutes/?id=216G> (accessed June 16, 2015). The administrative rules governing pipelines are Minnesota Administrative Rules Chapter 7852, *available at* <https://www.revisor.mn.gov/rules/?id=7852> (accessed June 16, 2015).

94 Minn R 7852.2100-7852.3100.

95 Minn R 7852.1700.

The statute and rules also specify, in detail, the criteria to be considered by the MPUC in determining the route of the pipeline and provide for the MPUC to select a route that minimizes human and environmental impact.[96] The rules also include permit conditions that apply to right of way preparation, construction, cleanup, and restoration.

The Minnesota statute, like those of Michigan and Illinois, provides that once the MPUC approves a pipeline route, the pipeline developer may, if necessary, exercise eminent domain authority to acquire easement rights along the pipeline route. The Minnesota statute expressly preempts all local zoning and land use regulations with respect to a pipeline permitted by the MPUC.[97]

Finally, the Minnesota rules require the permit applicant to pay application fees sufficient to cover the actual costs necessarily and reasonably incurred by the state in processing the application.[98]

2. Regulating Petroleum Pipeline Safety

a. Federal Pipeline Regulation

In contrast to petroleum pipeline *siting*, the *regulation* of petroleum pipeline safety occurs primarily at the federal level. The key federal law is the Pipeline Safety Act.[99] It grants the U. S. Department of Transportation authority to regulate the safety of hazardous liquids transportation pipelines, including those carrying crude oil and refined petroleum products. Within the Department, this program is administered through PHMSA and its Office of Pipeline Safety.[100]

As noted earlier, PHMSA administers two main sets of regulations involving oil pipeline safety:

- *Transportation of Hazardous Liquids by Pipelines*.[101] This set of regulations addresses pipeline reporting, design, materials, construction, pressure testing, operations, maintenance, corrosion control, integrity management, operator qualification, public awareness, and damage prevention.
- *Response Plans for Onshore Oil Pipeline.*[102] These regulations outline the required contents of spill response plans, and provide for review and approval of the plans by PHMSA – with opportunity for review and input by the U.S. Coast Guard and the EPA. Plans must be resubmitted at least every five years, or when significant information changes.

The Pipeline Safety Act distinguishes between **interstate** pipelines and **intrastate** pipelines. Interstate pipelines transport hazardous liquids in interstate or foreign commerce.[103] Intrastate pipelines transport such liquids only within a state.

Under the Act, only PHMSA is authorized to set safety standards for **interstate** hazardous liquid pipelines and enforce them; states may not.[104]

b. Opportunities for State Involvement in Pipeline Regulation

The Pipeline Safety Act gives each state the option of developing and implementing its own safety program for hazardous liquid pipelines. The State must seek certification from PHMSA that the state program is at least as stringent as the federal requirements. If PHMSA certifies the state program, then the state may assume responsibility for regulation of **intrastate** pipelines in place of PHMSA.[105] Further, a state with a PHMSA-certified program may impose *additional or more stringent* requirements on **intrastate** pipelines than the federal minimum standards.

96 Minn R 7852.1900.
97 Minn Stat 216G.02(4).
98 Minn R 7852.4000.
99 49 USC 60101 *et seq.*
100 49 USC 108(f)(1).
101 49 CFR 195.
102 49 CFR 194.
103 49 USC 60101(a) (8)(b).
104 49 USC 60104(c).
105 49 USC 60105.

A state with a PHMSA-certified program may also enter into an agreement with PHMSA to participate in oversight of **interstate** pipelines located within the state.[106] Under this type of "interstate agent" arrangement, the state program can assist PHMSA with overseeing record maintenance and reporting requirements, as well as pipeline inspections. However, PHMSA retains sole authority to regulate and take enforcement action related to such **interstate** pipelines.

Currently, 14 states have adopted legislation to become the regulatory authority for intrastate hazardous liquid pipelines.[107] Five of these states have also received the appropriate certification from PHMSA for oversight responsibility of interstate hazardous liquid pipelines. These states have statutory authority to adopt regulations for hazardous liquids pipeline operators that, at a minimum, meet the federal requirements of 49 CFR Parts 195 and 199.[108]

A state that participates in the programs outlined in 49 USC §§ 60105 and 60106 through the certification are required to conduct a minimum number of inspections per inspector and for the program as a whole. Failure to maintain the minimum number of inspections can result in the loss of the certification. 49 USC § 60107 contains provisions requiring minimum qualifications for state employees. States participating in the certification program must be prepared to provide resources to be able to adequately staff and train its employees. States that have done so have commonly used a combination of (a) federal grants, administered by PHMSA, that can support up to 80% of the program costs, and (b) user fees collected from pipeline operators.

Although Michigan does not currently have a program for regulating the safety of hazardous liquids pipelines, it does regulate the safety of **intrastate gas** pipelines and assists PHMSA in the safety oversight of **interstate gas** pipelines located within the state. Under current law,[109] the Public Service Commission is authorized to promulgate rules and prescribe safety standards for pipeline facilities and the transportation of gas. Using the statutory authority given in MCL 483.152, the PSC has adopted federal gas safety regulations[110] into the Michigan Gas Safety Standards. Because Michigan has a PHMSA-certified safety program for intrastate gas pipelines, it is free under the federal Pipeline Safety Act to establish and promulgate additional safety regulations beyond the federal minimum safety standards on intrastate pipelines. Michigan has used this authority for intrastate natural gas operators to promulgate additional regulations providing an increased level of safety for those pipelines. Through this agreement with PHMSA, the PSC participates in the inspection and oversight of interstate gas pipelines in Michigan.

As noted above, under the Pipeline Safety Act, it is possible for Michigan to establish a parallel program for regulating the safety of intrastate hazardous liquid pipelines. If that policy decision were made, it would require the enactment of new state laws and the promulgation of new state regulations consistent with federal standards, as well as the funding, recruiting and retaining of sufficient staff to successfully implement the program. Further, to realize the full potential benefits of the program (including higher safety standards for intrastate pipelines and assisting PHMSA in oversight of interstate hazardous liquids pipelines such as Enbridge's Line 5), Michigan would need to seek and retain PHMSA certification of its program.

In the absence of a Michigan program for hazardous liquids pipeline safety, there is currently no established mechanism for consultation and coordination between Michigan and PHMSA regarding petroleum pipelines. As an interim measure, until the state decides whether to develop its own safety program for hazardous liquids pipelines, Michigan could seek to informally establish improved

106 49 USC 60106.

107 PHMSA maintains a list of states that participate in intrastate and interstate programs, which is available at <http://primis.phmsa.dot.gov/comm/Partnership.htm?nocache=6957> (accessed June 20, 2015).

108 For example, both Minnesota and Washington have adopted hazardous liquids pipeline safety regulations. Minnesota's legislative authority over intrastate pipelines and facilities is found in Chapter 299F Section 299F.641, *available at* <https://www.revisor.mn.gov/statutes/?id=299F.641> (accessed June 19, 2015). The Minnesota Legislature also directs the Minnesota Office of Pipeline Safety to seek authority to act as an interstate agent in Chapter 299J Section 299J.01, *available at* <https://www.revisor.mn.gov/statutes/?id=299J.01> (accessed June 19, 2015). The Washington legislative authority is found in Chapter RCW 81.88.060 and 81.88.090, *available at* <http://apps.leg.wa.gov/rcw/default.aspx?cite=81.88> (accessed June 19, 2015).

109 1969 PA 165 MCL 483.151 *et seq*.

110 49 CFR 191, 192, and 199.

communications with PHMSA on issues of mutual concern. This could include, for example, periodic meetings between relevant state agencies and PHMSA representatives and establishing designated points of contact to address concerns as they arise.

3. Addressing Oil Pollution of Water

a. Federal Requirements for Emergency Response and Spill Response Planning.

After the *Exxon Valdez* spill in Alaska, Congress enacted the Oil Pollution Act of 1990 (OPA)[111] which amended the federal Clean Water Act. Among other things, the OPA requires various types of plans for responding to oil spills. These include the nationwide National Contingency Plan and regional Area Contingency Plans. The EPA and the U.S. Coast Guard are involved at both levels. Committees that include federal, state, and local agencies participate in the development of the Area Contingency Plans.

The OPA requires the owners/operators of oil facilities, including pipelines, to develop more detailed, site-specific Facility Response Plans (also called Spill Response Plans). The Facility Response Plans must be consistent with the National and Area Plans and must detail a chain of authority for spills, specify personnel and equipment capable of responding to a "worst case" spill from a pipeline or other facility, and describe training, testing, and unannounced drills.

The U.S. Department of Transportation is responsible for reviewing and approving Facility Response Plans for on-shore and offshore transportation facilities, including oil pipelines. PHMSA has promulgated rules establishing requirements for response plans for on-land pipelines.[112] As a practical matter, pipeline operators like Enbridge submit plans to PHMSA that cover both onshore and offshore pipelines, such as the Plan covering Line 5, including the Straits Pipelines.

Neither the OPA nor PHMSA's plan regulations *require* pipeline owners to provide their plans to state authorities for review and approval. Consequently, Enbridge has not submitted its federally mandated response plans for pipelines in Michigan to the state for review and approval.

b. Gaps in Michigan Law for Emergency Response and Spill Response Planning.

No current Michigan law or regulation requires the owner/operator of a petroleum pipeline in Michigan to submit a plan for preventing or responding to a pipeline spill to a state agency for review and approval. Previously, Part 31 (Water Resource Protection) of the Natural Resources and Environmental Protection Act (NREPA)[113] authorized DEQ to promulgate administrative rules, but this is no longer the case.

When DEQ had rule-making authority under Part 31, it promulgated rules relating to the storage of oil and polluting materials, (referred to as the "Part 5 Rules")[114] which remain in effect. Part 5 Rules require the owner/operator of certain facilities to provide DEQ with a Pollution Incident Prevention Plan that includes, among other things, plans for addressing spills.[115] However, the *DEQ Part 5 rules specifically exclude from their coverage* "transportation-related facilities," which, as defined in 40 CFR 112, include *interstate or intrastate pipeline systems.*

The Michigan Legislature requires that certain releases of oil and other polluting materials be reported to DEQ and local response authorities, but only to the extent such reporting is required under the DEQ Part 5 rules.[116] Thus, while spills of 55 gallons or more from a facility covered by Part 5 rules must be reported within 24 hours, spills from pipelines need not be reported because pipelines are not covered by Part 5 rules.

111 33 USC 2701 to 2762.
112 49 CFR 194.
113 MCL 324.3101 *et seq.*
114 Mich Admin Code, R 324.2001 to 324.2009.
115 Mich Admin Code, R 324.2006.
116 MCL 324.3111b.

Against this background, it is not surprising that Enbridge failed to directly report to the DEQ the massive July 2010 spill from its Line 6B pipeline near Marshall. Nor is it surprising that Enbridge had not previously submitted any applicable spill response plan to the State for review and approval.

c. Ability of States to Impose Additional Spill Planning and Reporting Requirements.

The federal OPA allows states to independently impose additional spill planning and reporting requirements on pipeline operators so long as they are at least as stringent as the federal requirements. Specifically, the OPA contains a "savings clause"[117] that expressly preserves the authority of each state to impose any additional requirements with respect to oil spills and response within the state. PHMSA's regulations also allow pipeline operators to submit state-approved spill response plans to satisfy federal requirements.[118]

Some states, including Washington and Alaska, have used this opportunity to adopt legislation and regulations that require oil facilities, including pipelines, to develop state-approved facility response plans at least as stringent as federal requirements.[119] These states also provide opportunities for public notice of opportunities to comment on plans, including plans for particular geographic areas.[120]

If Michigan took the opportunity to develop its own requirements, it could take an active and effective role in the development and periodic review of the site-specific plans rather than relying on whatever is proposed by the operator and accepted by PHMSA. The goal would not be to duplicate the existing planning process, but to improve it and make the resulting plans more accountable to the State's concerns. This approach would also enable Michigan to ensure that relevant state and local agencies are "in the loop" as plans are tested, drilled, and implemented.

d. Comparison of fines for oil pollution of water under federal and current Michigan law.

Both federal and state environmental laws provide for civil and criminal fines or penalties for discharging pollutants, including oil, into water. Such fines or penalties not only punish violations of water pollution standards after they occur, they also provide important incentives to manage pollutants in ways that minimize the risk they will be released into the environment in the first place.

The federal Clean Water Act, as amended by the Oil Pollution Act, provides, among other things, that a court can impose very substantial civil penalties on persons responsible for discharging oil or hazardous substances into water.[121] The maximum penalties that can be imposed are periodically adjusted for inflation[122] and depend on the degree of fault involved, how long the discharge lasted, and the quantity of oil discharged. Currently:

- A person responsible for a discharge is liable for a civil penalty of up to $37,500 per day of violation or up to $2,100 per barrel of oil discharged.[123]
- If the discharge was the result of gross negligence or willful misconduct, the person is liable for a civil penalty of not less than $150,000 and not more than $5,300 per barrel discharged.[124]

117 33 USC 2718(a).
118 40 CFR 194.109.
119 The Washington Oil and Hazardous Substance Spill Prevention and Response statute (RCW 90.56) is available at <http://apps.leg.wa.gov/RCW/default.aspx?cite=90.56&full=true> (accessed June 16, 2015).
120 *See, e.g.,* WAC 173-182-640 Process for public notice and opportunity for public review and comment period, *available at* <http://app.leg.wa.gov/WAC/default.aspx?cite=173-182-640> (accessed June 16, 2015).
121 33 USC §1321(b)(7), *available at* <https://www.law.cornell.edu/uscode/text/33/1321#b_7_A> (accessed June 17, 2015).
122 *See* 40 CFR 19.4, *available at* <http://www.gpo.gov/fdsys/pkg/CFR-2014-title40-vol1/pdf/CFR-2014-title40-vol1-sec19-4.pdf> (accessed June 17, 2015).
123 33 USC §1321(b)(7)(A).
124 33 USC §1321(b)(7)(D).

Apart from laws relating to petroleum storage tanks, Michigan does not have a statute specifically addressing oil pollution. However, Michigan's general water pollution control statute, Part 31 (Water Resources Protection) of the Natural Resources and Environmental Protection Act,[125] prohibits discharges of injurious substances (which include oil or other petroleum products) into state waters.[126]

Part 31 provides for civil fines as follows:

- A civil fine for a violation shall be not less than $2,500 [total] or not more than $25,000 per day of violation.[127]
- If the court finds that the actions of the civil defendant "posed a substantial endangerment to the public health, safety, or welfare, the court shall impose, in addition to the sanctions set forth in subsection (1), a fine of not less than $500,000.00 and not more than $5,000,000.00."[128] However, in order to find the defendant liable for such "substantial endangerment," the court must first determine that the defendant "knowingly or recklessly acted in such a manner as to cause a *danger of death or serious bodily injury*" and either actually knew or understood that danger or acted in gross disregard of the standard of care of a reasonable person under the circumstances.[129] (Emphasis added).

Thus, current Michigan law differs from federal law in the following ways:

- The Michigan maximum fine of $25,000 per day of violation is lower than the corresponding federal civil fine of $37,500 per day of violation and is not adjusted for inflation.[130]
- The Michigan civil fines do not take into account the quantity of a spill, *i.e.*, number of barrels of oil discharged.
- The standards of proof for the aggravated offense and higher tier of fines or penalties are drastically different. Under the federal Oil Pollution Act, "gross negligence" triggers the increased penalties. Under Michigan's Part 31, increased fines only apply in very narrow circumstances involving a danger of death or serious bodily injury, regardless of the magnitude of the discharge and the resulting environmental and economic harm.

Oil Pollution Penalties - Michigan vs. Federal

	Michigan	Federal
Maximum Fine Per Day	$25,000 No change in 25 years	$37,500 Adjusted for inflation
Fine Per Barrel of Spill	Amount of spill not considered	$2,100 to $5,300 per barrel
Standard of Proof for Aggravated Penalty	Danger of death or serious bodily injury	Gross negligence

125 MCL 324.3101 *et seq.*
126 MCL 324.3109(1).
127 MCL 324.3115(1).
128 MCL 324.3115(3).
129 MCL 324.3115(5).
130 The current civil fine amounts in MCL 324.3115 were set 25 years ago in 1990 PA 19, and have not been adjusted since then.

Coordination among State Agencies

Several state agencies, including the Michigan State Police, the Public Service Commission, the Departments of Environmental Quality, Natural Resources, and Transportation, and the Attorney General have or may have roles and responsibilities related to petroleum pipelines and petroleum pipeline incidents. The Task Force, through its Work Groups, has reviewed and compared existing agency practices and resources in three areas to identify opportunities for continued and improved coordination: (1) pipeline mapping, (2) emergency planning and spill response, and (3) emergency response training exercises and drills.

1. Pipeline Mapping

Accurate and up-to-date maps of existing petroleum pipelines are an essential tool for state agencies that may be involved in issues related to pipelines such as environmental permitting, land management, emergency planning, and spill response. By comparing maps and other pipeline information that PHMSA can make available to governmental agencies such as the Public Service Commission, the agency staff involved in the Work Groups were able to confirm a common base of information regarding existing petroleum pipelines in the state. Such information needs to be periodically verified and updated.

In addition, to promote efficiency and coordinated agency actions, especially in spill or emergency response situations, it would be important to store the pipeline related information on a common, state-wide Geographic Information System server. This would allow its integration with other geographic data, such as land use and environmental features, and distribution to other state agency applications, as needed. Such a server and data could potentially be housed through the Center for Shared Technology Partnerships[131] within the Department of Technology Management and Budget (DTMB). Funding needs for long-term storage of these data layers could be significant and should be evaluated to ensure sufficient funds available.

A designated state agency, with appropriate technology capabilities, could develop a web mapping application for the state that displays current pipeline data and other critical state of Michigan map layers. The Michigan State Police, DTMB, and the Department of Natural Resources have the appropriate technology to achieve this goal. A work group that consists of key state agencies including, but not limited to, the Departments of State Police, Technology, Management & Budget, Natural Resources, and Environmental Quality, and the Public Service Commission, could be established to determine the structure, available data, and use of the pipeline web mapping applications.

2. Emergency Planning and Spill Response

The Michigan Emergency Management Plan compiled by the Michigan State Police Emergency Management and Homeland Security Division[132] establishes the overall state framework for addressing emergencies. It includes procedures to be followed by state agencies in response to specific types of disasters, including oil spills and other hazardous materials incidents.

Some state agencies have additional response plans in place for specific roles and responsibilities during petroleum pipeline and hazardous materials emergencies. These agencies include the Departments of State Police, Natural Resources, Environmental Quality, and Transportation. All plans should be reviewed and updated on a regular basis to ensure continued efficient and effective response collaboration.

131 *See* <http://www.michigan.gov/cgi> (accessed June 17, 2015).
132 *See* Michigan Department of State Police, Emergency Management and Homeland Security Division (MSP/EMHSD), *Michigan Emergency Management Plan (MEMP)* (April 24, 2014), *available at* <http://www.michigan.gov/documents/msp/MEMP_portfolio_for_web_383520_7.pdf> (accessed June 17, 2015).

The Work Group identified a need to document state agency capabilities and resources in the event of a spill. While the Michigan Critical Incident Management System (MI CIMS)[133] provides a list of many resources throughout the state, petroleum spill-specific resources must be identified to ensure an accurate list of the resources needed for an effective response is maintained.

The Work Group recommended that state agencies update the MI CIMS resource inventory and other resource identification lists with items potentially needed, currently available, the resource location, and quantity. These lists should include current state agency and pipeline company contracts to identify response and recovery resources that are held by duplicate resource providing companies, to ensure adequate resources are available during an incident.

In addition, the Work Group recommended that appropriate state agencies compile and maintain a list of agency personnel trained and certified in hazardous materials operations and technicians as outlined in Michigan Occupational Health and Safety Administration standards.

3. Emergency Response Training Exercises and Drills

To establish effective responses, it is critical to identify appropriate agencies and private sector personnel to participate in spill response planning and training. Michigan maintains a multi-year, State of Michigan/ Urban Area Security Initiative Training and Exercise Plan (TEP). This living document provides the State a roadmap in identifying training and exercises within each region. A Training and Exercise Planning Workshop (TEPW) is conducted annually to review program accomplishments and make necessary modifications to the previous multi-year training and exercise plan and exercise schedule.

The Work Group recommendations included:

a. Local, state, federal, and tribal government partners should attend the TEPW so that all pipeline training and exercises are integrated with training and exercises held by Michigan's local and state agencies.

b. The State should participate in exercises led by the U.S. Coast Guard and other federal agencies.

c. The State should participate in exercises with pipeline companies. These exercises should be regularly scheduled and include representatives from appropriate public and private stakeholders. The exercises should include seminars, workshops, table-top or operations-based drills, and full scale or functional exercises. Due to the number and frequency of exercises conducted annually by local and state agencies, the Work Group reiterated the importance for all affected agencies to attend the annual TEPW.

d. State agencies should provide National Incident Management System (NIMS)[134] training to appropriate staff to improve the use and effectiveness of the incident command system.

Public Involvement and Information

1. Possible Advisory Committee on Pipeline Safety

As a result of increased public awareness of pipeline safety issues, some states, most notably Washington, have established advisory committees on pipeline safety.[135] Although only advisory, these committees provide a useful means of identifying and communicating public concerns to relevant federal, state, and local agencies as well as crafting recommendations to improve pipeline safety.

133 *See* <http://www.michigan.gov/msp/0,4643,7-123-72297_60152_68994---,00.html> (accessed June 17, 2015).
134 *See* Michigan State Police, National Incident Management System, *available at* <http://www.michigan.gov/msp/0,4643,7-123-1564-191891--Y,00.html> (accessed June 19, 2015).
135 *See, e.g.*, Washington State Legislature, Citizens Committee on Pipeline Safety, RCW 81.88.140, *available at* <http://app.leg.wa.gov/RCW/default.aspx?cite=81.88.140> (accessed June 19, 2015).

Congress recognized the existence and importance of such committees in the Pipeline Safety Improvement Act of 2002 which provides:

> Within 90 days after receiving recommendations for improvements to pipeline safety from an advisory committee appointed by the Governor of any State, the Secretary of Transportation shall respond in writing to the committee setting forth what action, if any, the Secretary will take on those recommendations and the Secretary's reasons for acting or not acting upon any of the recommendations.[136]

A state advisory committee on pipeline safety would provide Michigan with another avenue of getting issues of state concern before the U.S. Department of Transportation (and thus PHMSA).

Both the National Wildlife Federation and the Pipeline Safety Trust have recommended that Michigan establish an advisory committee on pipeline safety.

If established, such an advisory committee could:

a. Advise state agencies and other appropriate federal and local government agencies and officials on matters relating to hazardous liquid pipeline safety, routing, construction, operation, and maintenance.

b. Consist of members appointed by the governor, including members representing local governments, the public, and pipeline owners and operators.

c. Have the ability, under Section 24 of the federal Pipeline Safety Improvement Act of 2002, to make recommendations to and request information from the U.S. DOT regarding pipeline safety to which the Secretary of Transportation would be obligated to respond within 90 days.

It should be noted that the Michigan Citizen-Community Emergency Response Coordinating Council (MCCERCC) was established by Executive Order No. 2007-18. This Council performs some related functions involving volunteer coordination, hazard mitigation, and emergency response. It is chaired by the Michigan State Police, Emergency Management and Homeland Security Division (MSP/EMHSD) and is comprised of 19 members, including the directors or designees of eight state departments or agencies, and 11 public members appointed by the governor.[137]

As currently established, the Council addresses a broad range of threats to public safety, but does not specifically focus on issues related to pipeline safety. If a state advisory committee on pipeline safety were to be established, its responsibilities should be framed to avoid duplication of the Council's work and promote coordination with the Council as appropriate. Alternatively, the existing Council could be modified, by executive order, to assume the broad pipeline safety responsibilities outlined above.

2. Continuing Petroleum Pipeline Information Website

The demonstrated strong public interest in issues relating to petroleum pipelines will undoubtedly extend beyond the existence of the Task Force. To address that interest and as a follow-up to the Task Force, the Work Group recommended that the State consider maintaining a continuing website that would:

a. Contain the final Task Force Report and recommendations; and

b. Provide a continuing repository for relevant public information and links, *e.g.,* PHMSA websites and publicly accessible pipeline mapping information, and if established, links to the advisory committee proposed above.

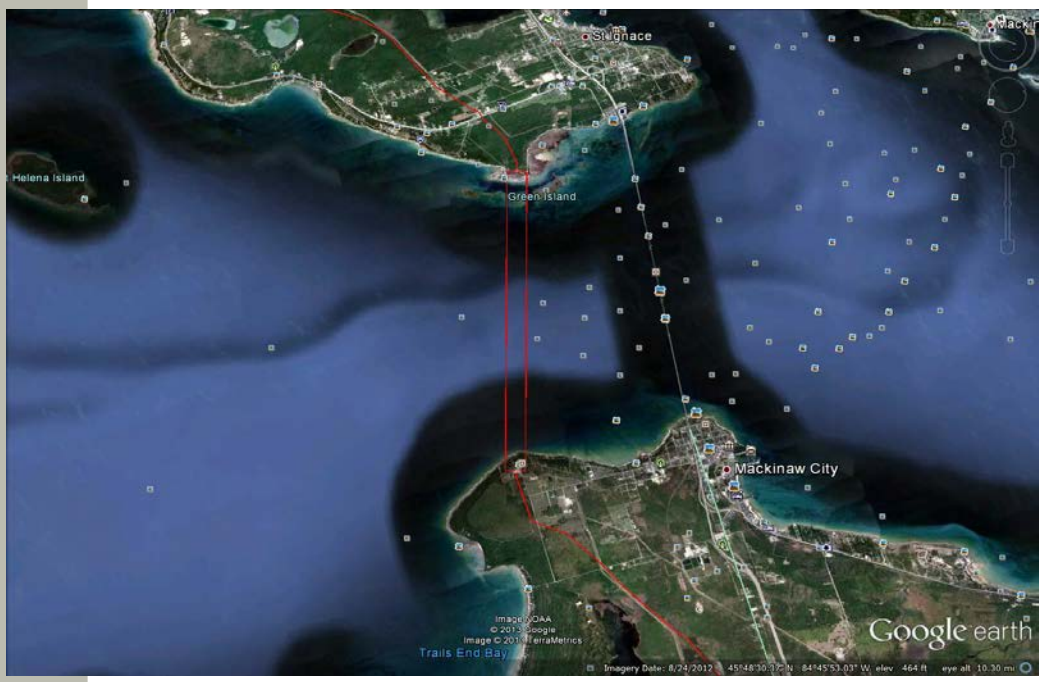
136 Section 24 of the Pipeline Safety Improvement Act of 2002, 49 USC 60101 *et. seq.*
137 *See* <http://www.michigan.gov/msp/0,4643,7-123-60152_69727-198426--,00.html.> (accessed June 17, 2015).

Straits Pipelines Issues

Development of Line 5 and the Straits Pipelines

What is now known as Enbridge's Line 5, including the Straits Pipelines, was conceived and built as a means of transporting crude oil produced in Alberta to refineries located in Sarnia, Ontario without interruption. In the late 1940s, Imperial Oil Company, Limited began producing significant quantities of crude oil from the Leduc oil fields in Alberta.[138] It formed a subsidiary, Interprovincial Pipe Line Company (IPL) (a corporate predecessor of Enbridge), which developed a series of pipelines to transport oil from Alberta to various refineries. By 1950, a pipeline had been completed eastward as far as Superior, Wisconsin, on the shore of Lake Superior. Over the next few years, Imperial Oil transported approximately 50 million barrels of oil on a fleet of Great Lakes tankers from Superior, Wisconsin to refineries near Sarnia, Ontario.[139]

Because of increasing oil production and because tankers could not operate during winter months on the Great Lakes, IPL decided, in late 1952, to extend its pipeline system from Superior to Sarnia. Contemporary records created by IPL's principal contractor, Bechtel Corporation, indicate that IPL considered only two alternatives: (1) a northern route across the Upper Peninsula, the Straits of Mackinac, and south through the Lower Peninsula to a crossing of the St. Clair River (what is now Line 5); and (2) a more overland route, south through Wisconsin, around Chicago, and then east across Michigan's Lower Peninsula to the St. Clair River (similar to Line 6 which was built in 1969). IPL chose the shorter northern route.



IPL, its wholly-owned American subsidiary Lakehead Pipeline Company, Bechtel, and various other contractors completed the entire process of designing the 645 mile-long Line 5 pipeline, obtaining rights of way, securing required legal approvals, contracting, and constructing it in approximately one year, between November 1952 and January 1953. This process included:

- Engineering and constructing pipelines across the Straits of Mackinac, including a "submerged canyon" at depths of more than 250 feet, which IPL's parent company, Imperial Oil, described as "probably the most difficult project ever undertaken by pipe line engineers."[140]

138 *See, e.g., History of Enbridge, Inc.* Reference for Business, *available at* <http://www.referenceforbusiness.com/history2/0/Enbridge-Inc.html> (accessed June 17, 2015) and <http://www.enbridge.com/AboutEnbridge/CorporateOverview/Historical-Highlights.aspx> (accessed June 18, 2015). It should be noted that during that time period, crude oil was being produced in Alberta from conventional oil wells, not extraction of heavy tar sands.

139 See *Imperial Oil Limited Annual Report* (1952), *available at* <http://www.glenbow.org/collections/search/findingAids/archhtm/extras/iolpublications/ar1952.pdf> (accessed June 18, 2015).

140 See *Imperial Oil, Limited Annual Report* (1953), p.8, *available at* <http://www.glenbow.org/collections/search/findingAids/archhtm/extras/iolpublications/ar1953.pdf> (accessed June 18, 2015).

- Encouraging the Michigan Legislature to enact 1953 PA 10 so that the State, through the Conservation Commission, had the legal authority to grant pipeline easements on state land and lake bottomlands.
- Obtaining pipeline easements, including the Easement for the Straits of Mackinac Pipelines, from the Conservation Commission.
- Obtaining approval of the construction, operation, and maintenance of the pipeline in Michigan from the Michigan Public Service Commission under 1929 PA 16.[141]

The design and construction of Line 5 occurred long before the enactment of any modern federal or state environmental or hazardous liquid pipeline laws. But the issue of potential spills and pollution was identified and raised. Before recommending approval of the Straits Pipeline Easement, Conservation Commission staff requested that Lakehead provide information regarding the engineering of the proposed Straits Pipelines demonstrating that its construction and operation would not cause pollution of the Great Lakes. Lakehead provided some information contained in a document entitled "Engineering and Construction Considerations for the Mackinac Pipeline Company's Crossing of the Straits of Mackinac."[142] This document, and its attachments, described engineering considerations for the design and placement of the pipelines. It sought to reassure the State, asserting that the pipelines were intended to ensure the uninterrupted supply of crude oil, and that "the loss of revenue which would result from any possible break in flow would be of the most serious importance," and that "the seriousness of possible contamination of the Lake waters was considered and every effort has been made insure this could not happen."

Apart from describing various possible pipeline locations within the Straits, the provided documents contained no discussion or analysis of any alternatives to the proposed Straits crossing – including the alternate pipeline route around Chicago that IPL had privately considered and rejected before approaching the State of Michigan. The only alternative alluded to was the then-existing use of Great Lakes tankers to transport oil from Superior to Sarnia. In that regard, the document simply offered: "Any possible contamination of the waters, caused by oil spillage from the pipeline crossing is considered remote in comparison to the amount and possibility of spillage from oil tankers."[143]

1953 Straits Pipeline Easement

On April 23, 1953, the Conservation Commission granted the "Straits of Mackinac Pipe Line Easement"[144] to Lakehead Pipe Line Company, Enbridge's corporate predecessor. Subject to the various terms and conditions stated in paragraphs A through Q of the document, the easement authorized Lakehead, its successors and assigns to "construct, lay, maintain, use and operate two (2) pipelines…[each located within specified parcels of bottom lands]…for the purpose of transporting any material or substance which can be conveyed through a pipe line…"

The 1953 Easement is a legally binding agreement between the State of Michigan and Enbridge as the successor to Lakehead. Some of the major terms and conditions are outlined below, by reference to the paragraph designations in the document:

141 *In the matter of Lakehead Pipe Line Company,* Michigan Public Service Commission Case No. D-3903-53.1, Opinion and Order, March 31, 1953, *available at* Task Force Report Appendix, *supra* at A.3.
142 Task Force Report Appendix, *supra* at A.2.
143 While oil transportation by tanker unquestionably presented, and today still presents risks of water pollution, the authors of the document presented no data or analysis to support the conclusions made about the relative likelihood and magnitude of oil spills to the Great Lakes from the Straits Pipelines and oil tankers. Nor did it document that any such spills from Great Lakes crude oil tankers had occurred.
144 A copy of the 1953 Easement is included in the Task Force Report Appendix, *supra* at A.1.

- Paragraph A. Standard of Care and Minimum Specifications: In exercising its rights under the easement, including testing, operating, and maintaining the pipelines, Enbridge "shall follow the usual, proper and necessary procedures for the type of operation involved, and *at all times shall exercise the due care of a reasonably prudent person for the safety and welfare of all persons and of all public and private property*, shall comply with all laws of the State of Michigan and of the Federal Government . . . and, in addition, shall comply with [minimum specifications and conditions listed in subparagraphs (1) though (14)]." (Emphasis added) The minimum specifications include among other things, the design, quality, testing, and installation of the pipe, automatic shut off and check valves, cathodic protection to prevent deterioration of pipe, specified pipe coatings, and conformance with detailed plans and specifications filed with the Department of Conservation. One notable minimum condition, subparagraph (10), provides: *"The maximum span or length of pipe unsupported shall not exceed seventy-five (75) feet."* (Emphasis added.)[145]
- Paragraph B. Notifications: Lakehead is required to give the State notice of various events, including, among other things, any breaks or leaks and any repairs or testing of repairs
- Paragraph C. Termination: The State can terminate the Easement if, within 90 days after notice of any breach of the terms and conditions of the Easement, Lakehead fails to correct the breach.
- Paragraph E. Written State Approval of Relocation, Replacement, or Major Repair: Before any relocation, replacement, or major repair of the pipelines, Lakehead must obtain the State's written approval of the procedures, methods, and materials to be followed or used.
- Paragraph F. Maximum Operating Pressure and Shutdown for Leaks: The Easement specifies that the maximum operating pressure of either pipeline shall not exceed 600 pounds per square inch. [Note: in its June 27, 2014 response to the State's requests for information, Enbridge stated that the pipe lines have operated "at approximately 25% of their Maximum Pressure."] Condition F also says, "If there is a break or leak or an apparent leak in either pipe line, or if [the State] notifies [Lakehead] that it has good and sufficient evidence that there is or may be a break or a leak," then Lakehead shall immediately shut down the pipeline and may not place it back in operation until after it passes a specified pressure test.
- Paragraph G. Response to Break or Leak: Condition G states, "If oil or other substance escapes from a break or leak in the said pipe lines, [Lakehead] shall immediately take all usual, necessary, and proper measures to eliminate any oil or other substance which may escape."
- Paragraph I. Inspection of Records and Reports: Condition I states "[Lakehead] shall permit [the State] to inspect at reasonable times and places its records of oil or other substances being transported in said pipelines and shall, upon request, submit to [the State] inspection reports covering the automatic shut off valves and check valves and metering stations used in connection with the Straits of Mackinac crossing."
- Paragraph J. Indemnification, Insurance and Performance Bond: Condition J(1) states, "[Lakehead] shall indemnify and hold harmless the State of Michigan from *all damage or losses caused to property (including property belonging to or held in trust by the State of Michigan), or persons* due to or arising out of the operations or actions of [Lakehead], its employees, servants and agents hereunder."

145 Because of variations in surface of the lakebed, the steel pipelines could not continuously conform to it, resulting in spans of pipe that would extend above the lakebed, without physical support. While, as Enbridge has subsequently emphasized, the "Engineering Considerations" submitted by Lakehead asserted that unsupported spans of up to 140 feet long would be structurally sound, the Department of Conservation apparently insisted upon the shorter, 75-foot maximum unsupported span as a safety measure. It is unclear whether, as initially constructed, the Straits Pipelines met that requirement. But it is undisputed that a number of the "grout bags" originally used as pipeline supports failed (*e.g.,* eroded away in the strong underwater currents), resulting in a number of unsupported spans exceeding the 75-foot limit. It was not until 2002 that Enbridge reported that situation and took action to begin to install new, steel pipeline anchors. After Enbridge's June 2014 response to a State information request confirmed that there were still some unsupported spans exceeding the 75-foot limit, the State formally notified Enbridge in July 2014 that it was in violation of the Easement condition. Enbridge responded in November 2014 that it had then completed installation of additional supports, and that no spans exceeded the limit specified in the Easement.

(Emphasis added.) It further requires Lakehead to maintain in full force and effect during the life of the easement, "a Comprehensive Bodily Injury and Property Damage Liability policy, bond or surety, in form and substance acceptable to [the State] in the sum of *at least* One Million Dollars … *covering the liability herein imposed upon [Lakehead]*." (Emphasis added.) Notably, the $1 million figure was a *minimum* amount specified in 1953. The required insurance must be sufficient to cover the liability imposed in the first sentence, that is, "all damage or losses…"

- Paragraph O. Right to Inspect: Condition O says that the State "shall have the right at all reasonable times and places to inspect the pipe lines, appurtenances and fixtures authorized by this easement."

Present Concerns Regarding the Straits Pipelines

In light of the massive 2010 oil releases from Enbridge's Line 6B near Marshall, Michigan, the well-documented systemic failures there,[146] the age of the Straits Pipelines, and location of those pipelines literally *in* the Great Lakes, there has been growing public and governmental concern about the Straits Pipelines. Their location makes them especially critical. Releases of oil from the Straits Pipelines could have a devastating ecological and economic impact. Water quality, fisheries, beaches, and the iconic center of Michigan's tourist economy would likely all be gravely damaged.

Recent scientific studies have documented that exceptionally strong and complex currents exist at the Straits, with flows oscillating between Lake Huron and Lake Michigan.[147] A report prepared by a University of Michigan Water Center researcher modeled the transport of materials released from the Straits Pipelines under a variety of conditions, illustrating the potential spread of pollution far into both Lakes.[148] As the author of that study observed, the Straits are the "worst possible place" for an oil spill in the Great Lakes.[149] Even Enbridge has acknowledged, "…the tremendous environmental sensitivity of the area" and that "the consequences [of a spill in the Straits] are very significant."[150]

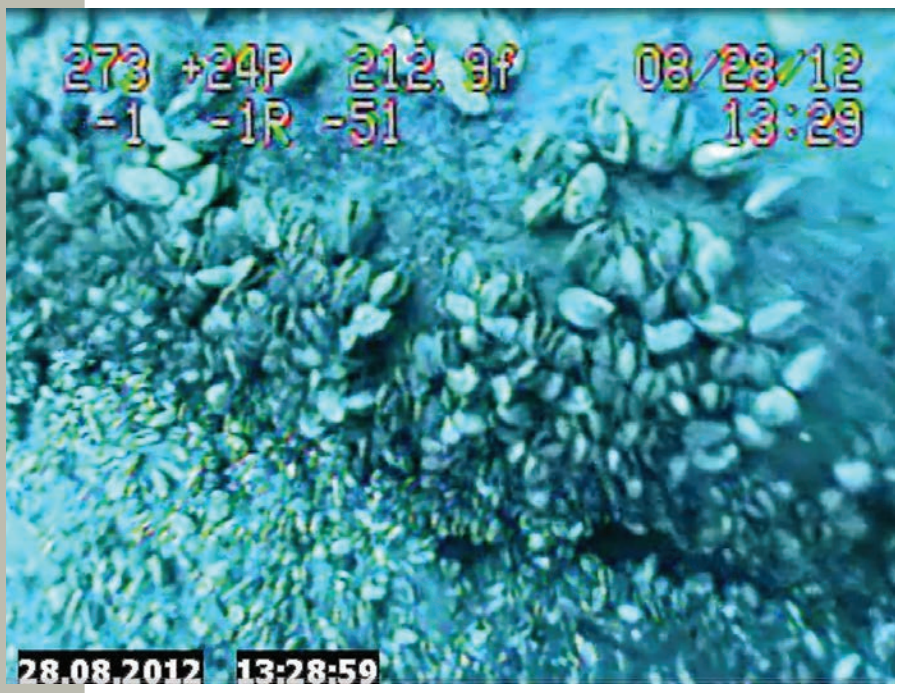
In its responses to State information requests, its presentation to the Task Force, and in public communications,[151] Enbridge has sought to reassure the public and the State that the Straits Pipelines are in "excellent" condition, present minimal risks, and can reasonably be expected to safely function indefinitely. In doing so, it has emphasized the differences between the materials used in the Straits Pipelines and the failed Line 6B; changes in its internal procedures subsequent to the Line 6B failure; the number and types of inspections it has performed; the absence, to date, of leaks from the Straits portion of Line 5; and, its stated commitment to a goal of "zero releases."

However, the information and assurances provided by Enbridge to date do not resolve outstanding concerns about the Straits Pipelines and their future operation. With so much at stake, neither the State nor the public has the information needed to independently validate Enbridge's conclusions, and to determine whether Enbridge's present and intended future operation of the Straits Pipelines is consistent with its legal obligations under the Easement – including its continuing duty to "exercise the due care of a reasonably prudent person for the safety and welfare of all persons and of all public and private property." For example:

146 *See* National Transportation Safety Board Accident Report, *Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release Marshall, Michigan July 25, 2010* Accident Report NTSB/PAR-12/01 PB2012-916501 (Washington, D.C.), *available at* <http://www.ntsb.gov/investigations/AccidentReports/Reports/PAR1201.pdf> (accessed June 18, 2015).
147 *See, e.g.,* David J. Schwab, Straits of Mackinac Contaminant Release Scenarios: Flow Visualization and Tracer Simulations (2014) and studies cited therein, *available at* <http://graham.umich.edu/media/files/mackinac-report.pdf> (accessed June 18, 2015).
148 *Id.*
149 See Jim Erickson, *supra.*
150 *See* Enbridge Energy, Limited Partnership, *Operational Reliability Plan – Line 5 and Line 5 Straits of Mackinac Crossing,* p.3, *available at* <http://www.enbridge.com/~/media/www/Site%20Documents/About%20Enbridge/Enbridge_Line_5_Operational_Reliability_Plan.pdf?la=en> (accessed June 18, 2015).
151 *Id.*

- While Enbridge has publicly listed the numbers and types of pipeline inspections that it or its contractors have performed, it has not fully disclosed the actual results of most of the inspections or the limitations of the test methods used. By not providing the State with actual copies of test results and other State-requested documents, based upon assertions of confidentiality,[152] Enbridge has limited opportunities for independent expert review.

- Enbridge has pointed to its use of remotely operated vehicles as a means of verifying the continued integrity of the external coating originally applied to the Straits Pipelines. But Enbridge has failed to acknowledge that much of the Straits Pipelines are now heavily encrusted with invasive quagga and/or zebra mussels and that, where present, make it difficult or impossible to view or photograph the external surface of the pipe.



- Moreover, Enbridge has not addressed the potential for acidic secretions from these mussels to promote corrosion of metal where the pipeline coating has been compromised.

- Given Enbridge's failure to maintain the legally required intervals for pipeline supports during an apparently extended period of time, and the very significant underwater currents at the Straits, there is a need to analyze the resulting stresses on the pipelines and potential impacts to their integrity.

These are merely a few examples. Substantial questions remain and can only be resolved by full disclosure of additional information, and rigorous, independent review by qualified experts.

152 The Task Force recognizes, of course, that public access to certain documents recognized as Critical Energy Infrastructure Information under federal law is legitimately restricted in order to protect infrastructure from sabotage or other security threats. But the Task Force disagrees that disclosing the content of test results on pipelines whose location and design have already been publicly disclosed by Enbridge itself would somehow compromise the security of the pipelines.

Risks Associated with Transporting Diluted Bitumen through the Straits Pipelines would Create an Unreasonable Risk of Harm, Contrary to the Standard of Care Required by the Easement

Crude oil is commonly classified into different categories based on the specific geologic formation from which it originates and certain physical properties, including its density. With respect to density, common classifications range from "light," "medium," "heavy," to "extra heavy." Density is measured on an index created by the American Petroleum Institute called the API gravity index. The index ranges from 0 to 70 degrees. Water is 10 degrees on this scale, so anything above 10 degrees will float, while anything below 10 degrees will sink.

As noted above, Enbridge has publicly stated that it has only transported "light" crude oil (which typically has a density of between 31 and 70 degrees) and natural gas condensates (which is lighter than light crude oil) on Line 5, including the Straits Pipelines.

But elsewhere on its pipeline system, including Line 6B, the site of the 2010 Kalamazoo River spill, Enbridge transports Alberta tar sands/bitumen, which is the heaviest type of crude oil (approximately 5 on the API gravity index). To transport it through pipelines, the tar sands oil must be mixed with dilutents (petroleum products and chemicals) so that it can flow through the pipelines. The resulting substance is sometimes referred to as diluted bitumen or "dilbit." Such diluted tar sands oil mixtures have an average density of approximately 20.8 degrees on the API gravity index.

However, when diluted bitumen is released into the environment through a spill, it will return to its constituent parts. When the 2010 Kalamazoo River spill occurred, the diluted bitumen initially floated on top of the water, where it could be recovered through conventional cleanup methods (*e.g.,* booms to contain the oil and pumps to suck it off the top of the water). But after a few days, the dilbit began to separate into its constituent parts and the bitumen/tar sands crude began to sink. That process greatly extended the duration of the cleanup and ultimately made it impossible to recover all of the oil.

For these same reasons, the U.S. Coast Guard has publicly acknowledged that it lacks the capacity to effectively respond to spills of heavy crude oil in the Great Lakes.[153] In fact, a 2013 technical report prepared by the Coast Guard observed "Current methods are inadequate to find and recover submerged oil . . ."[154]

Under these circumstances, transporting tar sands crude oil – which could not be effectively cleaned up in the event of a spill – through the Straits Pipelines would present an unreasonable risk of harm to the environment and the economy. As such, it would violate the standard of care imposed on Enbridge under the terms of the 1953 Easement. As noted above, the Easement requires that "at all times [Enbridge] shall exercise the due care of a reasonably prudent person for the safety and welfare of all persons and of all public and private property . . ."

153 *See, e.g.*, Keith Matheny, *Coast Guard: We can't adequately respond to Great Lakes heavy oil spill, Detroit Free Press* (September 11, 2014), *available at* <http://www.freep.com/story/news/local/michigan/2014/09/11/coast-guard-we-cant-adequately-respond-to-great-lakes-heavy-oil-spill/15422415/> (accessed June 18, 2015)

154 See U.S. Homeland Security, Acquisition Directorate, Research & Development Center, Prepared by the U.S. Coast Guard, *Delivery of Bottom Oil Recovery Systems – Final Project Report* (June 2013), *p. v., available at* <http://www.uscg.mil/iccopr/files/Development%20of%20Bottom%20Oil%20Recovery%20Systems%20-%20Final%20Project%20Report.pdf> (accessed June 18, 2015).

Independent Risk Analysis is Needed to Determine Financial Responsibility Required by the Easement and to Inform Decisions about Future of the Straits Pipelines

As noted above, the Easement contains very broad liability and financial responsibility requirements. Condition J(1) says, "[Enbridge] shall indemnify and hold harmless the State of Michigan from *all damage or losses caused to property (including property belonging to or held in trust by the State of Michigan), or persons* due to or arising out of the operations or actions of [Enbridge], its employees, servants and agents hereunder." (Emphasis added.) It further requires Enbridge to maintain in full force and effect during the life of the easement, "a Comprehensive Bodily Injury and Property Damage Liability policy, bond or surety, in form and substance acceptable to [the State] in the sum of *at least* One Million Dollars . . . *covering the liability herein imposed upon [Enbridge]*." (Emphasis added.) Again, the $1 million amount specified (in 1953) was simply a minimum. The Easement requires coverage for *all* damages or losses arising from Enbridge's operations in the Easement.

To date, Enbridge has not documented that it is in compliance with this requirement. Its June 25, 2014 response to the letter from the Attorney General and the DEQ Director did not address this requirement. In related documents made available to the State in read-only mode through a web portal, Enbridge estimated the total cleanup and oversight costs that would result from a "worst case" spill ranged from approximately $445 million (summer spill scenario) to approximately $900 million (winter spill scenario). Notably, these estimates did not include any damages to persons, property, or natural resources for which Enbridge would be liable under the 1953 Easement, nor for any fines or penalties. In its February 27, 2015 response to the Task Force's follow-up questions (Question # 16), Enbridge appeared to discount its own previous estimates as "overly conservative" and estimated the total cleanup costs at approximately $400 million. And again, the estimate was limited to costs Enbridge may incur for performing spill response and did not include damages/losses to persons, property (public and private) resulting from a spill, or any fines/penalties.

By letter dated March 12, 2015, Attorney General Schuette and DEQ Director Wyant requested that Enbridge provide, within 30 days, a written response documenting the insurance Enbridge has in place to comply with the requirements of the Easement and explaining and documenting how that insurance satisfies the Easement condition.

In its response, dated April 17, 2015, Enbridge asserted, as it had in its February 27, 2015 letter, that the estimated response costs for a "worst case" spill were approximately $400 million, rather than the approximately $900 million costs it previously estimated in 2014. It also indicated that it currently has a program of insurance for all its operations on its entire system totaling $700 million, but that it would primarily rely on its own internal resources initially in the event of a spill.

In sum, Enbridge appears to have offered conflicting, incomplete, and inadequately supported estimates of its total liability under the Easement. Moreover, Enbridge's estimates cannot be considered completely objective as it has an inherent economic incentive to under-estimate the magnitude of a spill and the resulting liability.

To ensure a credible and reasonable estimate upon which to evaluate Enbridge's compliance with the Easement, as well as to inform decisions about the future operation of the Straits Pipelines, an independent analysis by qualified experts of a "worst case" release from the existing Pipelines is needed. This should include systematic analyses of relevant factors, including:

- the existing pipelines, control systems, leak detection methods, and shut-off valves, and the potential failure of those systems, in order to estimate the magnitude and duration of worst-case spill or loss from the pipelines;
- the likely fate and transport of the various materials carried in the pipelines, both horizontally and vertically, in the water and onto the shore, under varying seasonal and wind conditions, including winter ice-cover;
- the capabilities and limitations of existing spill response measures and available personnel and resources to contain and clean up the spill, and how that would impact the timing and scope of cleanup;
- the full costs of cleanup, monitoring, restoration, oversight, and damage assessment likely to result from the worst-case release;
- the resulting damages to natural resources; and
- the resulting public and private economic losses.

A Comprehensive Alternatives Analysis by Qualified Independent Experts is Needed to Guide Decisions about the Future of the Straits Pipelines

Enbridge asserts that the existing 61-year-old Straits Pipelines can be operated indefinitely and that it neither has, nor needs to consider, a plan to replace them. This is not a reasonable position. First, as noted above, the available information is insufficient to independently verify Enbridge's public assurances regarding the "excellent condition" of the Straits Pipelines or that its existing practices ensure that "the likelihood of a leak in the Straits is low."[155] Second, the likelihood of a leak is only one element of a reasonable assessment of risk; the magnitude of harm that would result from a release must also be considered. Here, it is undisputed that the ecological and economic resources that would be affected by a release are of critical importance. The waters of the Great Lakes, and the public uses of those waters are subject to, and protected by, the public trust. And, as noted above, the full costs and damages that would result from a release from the Straits have yet to be properly determined.

Again, in exercising its rights under the Easement, Enbridge is legally obligated to "at all times…exercise the due care of a reasonably prudent person for the safety and welfare of all persons and of all public and private property…." What a reasonably prudent person would do under a given set of circumstances necessarily depends upon a number of factors, including the alternatives available to that person and the benefits and risks of those alternatives. In this instance, determining what actions by Enbridge are consistent with its continuing duty to exercise due care requires consideration and comparison of the available alternatives as they relate to public safety and welfare and to public and private property. Thus, from a legal perspective, decisions about the future operation of the Straits Pipelines must be informed by careful consideration of the full range of alternatives available.

Moreover, even if consideration of alternatives were not legally required under the Easement, it would still be the right thing to do. Enbridge has repeatedly emphasized its stated commitment not only to the safety and reliability of its operations, but also to "building trust and engaging with our stakeholders" and to "transparency."[156] Those goals would be served by a thorough and credible evaluation of all alternatives, not just the continued operation of the existing Straits Pipelines for the indefinite future.

155 Enbridge Energy, Limited Partnership, *Operational Reliability Plan, supra* at p. 3.
156 *See, e.g.,* Enbridge Energy, Limited Partnership, *Operational Reliability Plan, supra* at 24.

In addition, a number of parties who have offered recommendations to the Task Force have persuasively emphasized the need for, and importance of, a comprehensive alternatives analysis. These parties include the National Wildlife Federation, FLOW, the Grand Traverse Band of Ottawa and Chippewa Indians, and the Keweenaw Bay Indian Community.

For all these reasons, a comprehensive analysis of alternatives to the existing Straits Pipelines is needed. As the operator of the Straits Pipelines under the Easement, Enbridge has the responsibility to ensure that alternatives are considered and that sufficient information is available to do so. However, the credibility of the analysis depends upon the use of qualified experts wholly independent from any influence by Enbridge. Thus, while Enbridge should provide funding to support the analysis, the experts should be independently selected and overseen.

The State Should Obtain Additional Information from Enbridge

As discussed above, the information currently available from Enbridge is insufficient to verify its assurances regarding the Straits Pipelines and to address substantial unanswered questions. The State, should, as a follow-up to this Report, continue to make specific written requests for additional information as needed.

Further, because PHMSA, rather than the State, has formal oversight and inspection authority over Enbridge's operations under the Pipeline Safety Act, the State should also request that Enbridge provide directly to the State, at regular intervals, additional information concerning its ongoing operations. This should include, for example, the Enbridge personnel on-site at the Straits responsible for reporting spills, specific products being transported in the pipelines, and comprehensive reports of all inspections, repairs, spills, and response actions.

RECOMMENDATIONS

After carefully considering the information collected, and based upon the findings summarized above, the Task Force unanimously makes the following recommendations for actions by the State. The Recommendations are organized into two groups: those specific to the Straits Pipelines, and those applying generally, on a state-wide basis, to issues involving liquid petroleum transportation pipelines in Michigan. The Straits Recommendations will require action by the Governor, the Directors of the Departments of Environmental Quality and Natural Resources, and the Attorney General. The Statewide Recommendations will require the action of the Governor, relevant state agencies, and the Michigan Legislature. Each recommendation is accompanied by a very brief summary of the reasons for it. More detailed supporting information appears in the preceding discussion of Task Force Summary of Findings.

Straits Pipelines Specific Recommendations

1. Prevent the Transportation of Heavy Crude Oil through the Straits Pipelines.
This should be accomplished through:

a. A legally binding agreement between Enbridge and the State of Michigan; or

b. Enforcement of the 1953 Easement that requires Enbridge to "exercise the due care of a reasonably prudent person" at all times.

Rationale: The U.S. Coast Guard has publicly stated that spills of heavy crude oil into open water cannot be effectively cleaned up. Transporting such material through the Straits Pipelines would unreasonably risk environmental and economic harm. The 1953 Straits Pipeline Easement requires Enbridge at all times in operating the Pipelines to "exercise the due care of a reasonably prudent person for the safety and welfare of all persons and of all public and private property."

2. Require an Independent Risk Analysis and Adequate Financial Assurance for the Straits Pipelines.
The State should:

a. Require Enbridge to pay for (but not control) an expert analysis of the potential liability from a worst case scenario spill; and

b. Require Enbridge to then maintain an adequate financial assurance mechanism to cover liability for all damages or losses to public and private property as provided under the 1953 Easement.

Rationale: The 1953 Straits Pipelines Easement makes Enbridge liable for all damages or losses to public or private property resulting from its operations at the Straits. It also requires Enbridge to maintain insurance or other financial assurance acceptable to the State covering its liability. An independent analysis by qualified experts of the consequences of a worst-case scenario spill is needed to establish the amount of the required financial assurance and to help guide decisions about the future of the Pipeline.

3. Require an Independent Analysis of Alternatives to the Existing Straits Pipelines.
These alternatives should include:

a. Constructing alternative pipelines that do not cross the open waters of the Great Lakes and then decommissioning the existing pipelines;

b. Utilizing alternative transportation methods and decommissioning the existing pipelines;

c. Replacing the existing pipelines using the best available design and technology;

d. Maintaining the status quo, including an analysis of the effective life of the existing pipelines.

Rationale: The 1953 Easement requires Enbridge to "exercise the due care of a reasonably prudent person for the safety and welfare of all persons and of all public and public and private property." What a reasonably prudent person would do depends on the circumstances involved, including the alternatives available and the associated risks and benefits. Decisions about the future of the Straits Pipelines must be informed by an independent, comprehensive analysis of the alternatives. The State should require Enbridge to pay for (but not control) a study by relevant experts of the feasibility, costs, including the specific costs to Michigan, and public risks and benefits of alternatives to the existing Straits pipelines.

4. Obtain Additional Information from Enbridge.
Even before those recommendations are implemented, the State should regularly obtain additional information from Enbridge about its ongoing operations, including the following:

a. The Enbridge personnel on-site at the Straits responsible for reporting spills;

b. The specific product(s) being transported in the Straits Pipelines; and

c. A comprehensive report from Enbridge, at least annually, of all inspections and repairs performed on its pipelines in Michigan, of any spills that have occurred, and the actions taken to address them.

Rationale: There are gaps in the information currently available about the Straits Pipelines. The State should continue to use its authority under the 1953 Easement to obtain specific information needed to fill in the gaps. Other statewide recommendations below include legislation that would improve spill reporting, require State approval of facility response plans, and enable the State to oversee and inspect interstate pipelines, including the Straits Pipelines.

Statewide Recommendations

1. Coordinate Mapping of Existing Pipelines among State Agencies.
This would include the following actions by the relevant state agencies:

a. Reviewing and updating pipeline data at least annually;

b. Storing pipeline maps and geographic information data on a central, statewide server, to be distributed, as needed, to state agencies;

c. Developing, and making available to agency staff, a web-mapping application that displays current pipeline and other critical geographic data; and

d. Establishing an inter-agency work group on pipeline mapping.

Rationale: Several state agencies, including the Departments of Environmental Quality, Natural Resources, State Police, and Transportation as well as the Public Service Commission deal with issues involving pipelines, e.g., land management, environmental permitting, transportation, and emergency planning and spill response. They need access to accurate and consistent information about the location of pipelines in relation to other geographic information such as water bodies, other sensitive environmental features, land uses, and other infrastructure. There is a need to ensure that state agencies are acquiring the latest information, are coordinating, and are able to integrate other geographic information into a single database available for planning an emergency response.

2. Ensure State Agencies Collaborate on Emergency Planning and Spill Response.
This would include the following actions by the relevant state agencies:

a. Reviewing agency plans on a regular basis for updates as needed;

b. Updating the Michigan Critical Incident Management System resource inventory and other lists of resources as needed;

c. Compiling and maintaining a list of the agencies' technicians and other personnel trained and certified in hazardous materials operations;

d. Verifying that internal state agency notification plans are up-to-date and functioning as intended; and

e. Providing petroleum pipeline information to the Michigan Intelligence Operations Center Critical Infrastructure Unit that maintains information on a statewide basis.

Rationale: All state agencies have disaster specific procedures for hazardous materials incidents outlined in the Michigan Emergency Management Plan. Some state agencies have additional response plans in place relevant to pipeline and hazardous materials emergencies. State agencies should collaborate regarding their respective plans and resources to ensure a coordinated and effective response to spills. State agencies should document their capabilities and resources available in the event of a spill.

3. Ensure Coordinated Emergency Response Training Exercises and Drills.
Actions include:

a. Federal, state, local, and tribal governmental partners should participate in the annual statewide Training and Exercise Planning Workshop conducted by the State Police;

b. The State should participate in planning and exercises led by the U.S. Coast Guard and other federal agencies;

c. The State should participate in regularly scheduled exercises with pipeline operators; and

d. State agencies should train staff in the National Incident Management System to improve the use and effectiveness of the incident command system.

Rationale: Federal and state agencies as well as pipeline companies participate in various emergency response training exercises and drills. There is a need to coordinate these efforts to promote effective responses to spills and to avoid duplication of effort.

4. Ensure Regular State Consultation with the Federal Pipeline and Hazardous Materials Safety Administration (PHMSA) on Hazardous Liquid (including Petroleum) Pipelines.
This should include:

a. Regular meetings between state agencies and PHMSA representatives on hazardous liquid pipeline issues; and

b. Establishing designated points of contact between the State and PHMSA.

Rationale: Under current law, the federal Pipeline and Hazardous Materials Safety Administration (PHMSA), not the State, regulates the design, safety and operation of hazardous liquid (including petroleum) transportation pipelines. Under a separate recommendation below (No. 10), Michigan would consider establishing its own safety program for hazardous liquid pipelines and seek certification from and an agreement with PHMSA to actively participate in oversight of petroleum pipelines. Even before that recommendation is implemented, the State should establish a closer working relationship with PHMSA on hazardous liquid pipelines.

5. Consider Legislation Requiring State Review and Approval of Oil Spill Response Plans, Improved Spill Reporting, and More Robust Civil Fines.

Michigan should consider adopting legislation that would:

a. Require pipeline operators to develop and submit for State review and approval spill response plans detailing how they will respond with sufficient resources to clean up spills and ensure effective communication with state and local agencies;

b. Require Pipeline operators to immediately report to the State any spill that may affect Michigan waters, including the Great Lakes; and

c. Raise the maximum fine for certain kinds of releases with the potential to cause significant harm. One model may be the Oil Pollution Act, which provides for fines based on the volume of the oil released.

Rationale: Because of gaps in existing Michigan law, petroleum pipeline operators are not required to submit their spill response plans to the State for review and approval. Nor are they required to report spills directly to the State. Civil fines or penalties can provide important incentive for pipeline operators to minimize the risks of pollution. Since 1990, Michigan law has limited civil fines for releasing pollutants (including oil) to waters of the State to a maximum $25,000 per day of violation, unless the release caused "a danger of death or serious bodily injury." The corresponding federal law, the Oil Pollution Act, sets significantly higher civil penalties, that are indexed for inflation, and take into account the quantity of oil spilled, e.g., up to $5,300 per barrel. The Oil Pollution Act preserves the rights of states to impose their own planning and reporting requirements (so long as they are at least as stringent as federal requirements) and does not limit the amount of fines a state can impose.

6. Evaluate Whether to Establish a Hazardous Liquids Pipeline Safety Program in Michigan.

Rationale: Under current Michigan law, the Public Service Commission regulates and oversees the safety of gas pipelines, but regulation of hazardous liquids (including petroleum) pipelines is left to the federal Pipeline and Hazardous Materials Safety Administration (PHMSA). Federal law allows states to develop their own programs and receive certification from PHMSA to take over full regulatory authority over intrastate pipelines, and to enter agreements to assist PHMSA in overseeing interstate pipelines. Such a certification and agreement would enable the State to obtain full access to information now submitted to PHMSA by pipeline operators—including information from Enbridge about the Straits pipelines—and put State inspectors on the front line in overseeing those petroleum pipelines. The Michigan Agency for Energy should evaluate the costs, staffing, and expertise required to develop a PHMSA-certified hazardous liquids pipeline safety program, and make a recommendation to the Governor and Legislature.

7. Consider Legislation or Rulemaking to Improve Siting Process for New Petroleum Pipelines.

Michigan should consider legislation and/or rulemaking to improve the state petroleum pipeline siting process by:

a. Clarifying the information required to be submitted by applicants;

b. Enhancing coordination between departments; and

c. Enhancing provisions for public notice.

Rationale: Under current Michigan law adopted in 1929, the Public Service Commission must approve the siting of new petroleum pipelines. The statute and the only administrative rule implementing it are very general, and provide little formal guidance on the information the permit applicant must provide, processes for public notice, and the standards to be used by the Commission in making its decision. Some other states have pipeline-siting laws that provide more specific guidance, standards, and processes.

8. Consider Issuing an Executive Order Creating an Advisory Committee on Pipeline Safety.
Michigan should consider establishing an advisory committee on pipeline safety that would:

a. Advise state agencies and appropriate federal and local government agencies and officials on matters relating to hazardous liquid pipeline safety, routing, construction, operation and maintenance.

b. Consist of members appointed by the governor, including voting members representing local governments and the public, and non-voting members representing pipeline owners and operators.

c. Make recommendations to and request information from PHMSA.

Rationale: As a result of increased public awareness of pipeline safety issues, other states, most notably Washington, have established advisory committees on pipeline safety. The National Wildlife Federation, among others, has recommended that Michigan create such an advisory committee. Congress recognized the existence and importance of such committees in section 24 of the Pipeline Safety Improvement Act of 2002, which requires PHMSA to respond in writing to recommendations and questions from such committees established by executive order issued by state governors.

9. Create a Continuing Petroleum Pipeline Information Website.
To address that interest and as a follow-up to the Task Force, the State should consider maintaining a continuing website related to petroleum pipelines that would:

a. Contain the final Task Force Report and recommendations;

b. Provide a continuing repository for relevant information and links to provide the public with information, *e.g.*, PHMSA websites and publicly accessible pipeline mapping information, and if established, linked to the Advisory Committee proposed above.

Rationale: There is a strong public interest in issues relating to petroleum pipelines that will extend beyond the existence of the Task Force. The creation of a website focusing on petroleum pipelines would give the public the opportunity to access information related to the work of the task force, and remain aware of the ongoing status of petroleum pipelines in Michigan.

RESPONSE TO COMMENTS AND PROPOSALS PROVIDED BY INTERESTED PARTIES

Sources of Comments

As outlined earlier, the Task Force benefitted from the comments and other information provided by a diverse and well-informed group of interested parties including:

- Environmental and other public interest and advocacy groups
- Members of the energy industry, including Enbridge
- Federal regulators
- Multi-state organizations
- Academics and technical experts
- The general public

The Task Force also benefitted from two formal government-to-government consultations with tribal governments. These consultations were attended by eleven of Michigan's twelve federally recognized tribes.

The Task Force was impressed with the level of interest, and the time and resources invested by individuals and groups that chose to participate in this process. It confirms that transportation of liquid petroleum products, and particularly Enbridge's Line 5 crossing at the Straits, are important issues for the citizens of Michigan. The Task Force also appreciated the quality and thoughtfulness of the comments and other information provided by interested parties. As demonstrated by the Task Force's recommendations, many of the interested parties' comments are consistent with actions recommended by the Task Force.

Categories of Comments and Proposals

1. Straits Crossing Comments and Proposals

The vast majority of the comments and proposals by interested parties concentrated on the section of Enbridge's Line 5 that crosses the Straits of Mackinac. While many had distinct interests, and may have focused on different aspects of the potential problems presented by Line 5, common themes emerged. The first four points below appeared to represent the highest priorities based on the number of interested parties that identified them as concerns:

- Concern over and opposition to tar sands or other heavy crude oil being transported on Line 5, particularly since the U.S. Coast Guard has publicly stated that it cannot respond to a heavy crude oil spill in open water
- The need for an independent analysis of the likelihood of a spill in the Straits, and the worst-case consequences of such an accident
- The need for an independent analysis of possible alternatives to transporting oil in a pipeline that crosses the Straits

- The lack of publicly available information about the operation and maintenance of the Straits Pipelines

Additional comments shared by at least some of those providing input included:

- General concerns about the age and assumed condition of the pipelines in the Straits
- Heightened concern about potential spills given the unique location of the Straits Pipelines, including the iconic setting, its importance as a tribal and State fishery, and the challenges presented by currents and potential ice cover
- Doubts about Enbridge's ability to respond to a spill in the Straits Pipelines, particularly given Michigan's experience with the rupture of Enbridge's Line 6B near the Kalamazoo River
- Suggestions that the State should more vigorously exercise its authority under the 1953 Easement with Enbridge to get adequate financial assurance, and require additional information, including risk and alternatives analyses
- Suggestions that the State should exercise its public trust authority to require a permit from Enbridge under Part 325, Great Lakes Bottomlands, of the Natural Resources and Environmental Protection Act, to get adequate financial assurance, and require additional information, including risk and alternatives analyses
- Calls for the State to compel the immediate closure or "decommissioning" of the Line 5 Straits crossing

2. Statewide Comments and Proposals

There were also common themes in the comments and proposals related to the broader issue of transporting petroleum products in pipelines across the State. These included:

- Increasing opportunities for public participation in the siting and oversight of petroleum pipelines
- Addressing the limited public access to information about existing petroleum pipelines in the state
- The lack of engagement and effective enforcement by regulators in the federal government
- The need for better coordination between state agencies, and between local, state, and federal governments

The Task Force's Responsiveness to Comments and Proposals

The Task Force's thirteen recommendations were identified earlier in the Executive Summary and on pages 49-53. Review of those recommendations and the comments identified above demonstrates substantial alignment between the Task Force's recommendations and the actions advocated by most of the interested parties.

1. Straits Crossing Comments and Proposals

Again, the vast majority of the comments and proposals were directed to the Line 5 Straits crossing. The Task Force has recommended four Straits-specific actions that address almost all of the comments and proposals regarding Line 5 outlined above. Specifically, the following recommendations address the highest priority concerns raised by interested parties – transportation of heavy crude in the Straits Pipelines, lack of an independent risk assessment or alternatives analysis, and the general lack of information regarding the condition of the Straits Pipelines:

- **Straits Recommendation 1 - Prevent Transportation of Heavy Crude Oil through the Straits Pipelines.** The Task Force is recommending that the State prevent Enbridge from transporting heavy crude oil through Line 5. This is due to the unique location of the pipeline, the lack of adequate information about the integrity of the pipelines, and the inability to clean-up heavy crude in open water. The State would prevent this using its authority under the 1953 Easement with Enbridge and the public trust.

- **Straits Recommendation 2 – Require an Independent Risk Analysis and Financial Assurance.** The Task Force is recommending that Enbridge pay for, but the State oversee, an independent analysis of the risks presented by a worst-case scenario spill. The Task Force is recommending that the financial assurance under the 1953 Easement then be set at an amount adequate to fully address all liability, including damages to public and private property from such a spill. The State would require this using its authority under the 1953 Easement with Enbridge and the public trust.

- **Straits Recommendation 3 – Require an Independent Analysis of Alternatives to the Existing Straits Pipelines.** The Task Force is also recommending that Enbridge pay for, but the State oversee, an independent analysis of the alternatives to transporting oil through the existing Straits Pipelines. This would include analyzing alternatives based on decommissioning the Straits Pipelines. The State would require this using its authority under the 1953 Easement with Enbridge and the public trust.

- **Straits Recommendation 4 – Obtain Additional Information from Enbridge.** The Task Force is recommending that the State require Enbridge to fill in gaps in the information currently available. It is also recommending that the State require Enbridge to regularly provide additional information about personnel responsible for responding to spills, products transported, and inspections and repairs. The State would require this using its authority under the 1953 Easement with Enbridge and the public trust.

2. Statewide Comments and Proposals

The Task Force's Statewide Recommendations also respond to most of the comments and proposals made on the broader issue of petroleum pipelines throughout the State:

- **Statewide Recommendations 1, 2, and 4:** These recommendations would require state agencies to coordinate pipeline mapping, and emergency planning and response. In addition, the recommendations discussed in the previous bullets would compel much greater communication and coordination between state agencies involved in pipeline siting, regulation, and emergency response.

- **Statewide Recommendations 3, 4, 6, and 8:** While the State cannot compel the federal government to undertake more rigorous oversight of petroleum pipelines, it can take various actions to engage with the federal government, and create an opportunity to have greater collaboration with federal regulators. Statewide Recommendation 3 would result in more engagement with the federal government in emergency response planning and exercising. Statewide Recommendations 4 and 8 would result in greater communication between the federal regulator, PHMSA, and state regulators. And Statewide Recommendation 6 could result in the state assuming some of the responsibilities currently exercised by PHMSA, giving the state more control over things like inspections.

- **Statewide Recommendations 7, 8, and 9:** These recommendations would provide for greater public involvement and greater access to information. Recommendation 7 recommends that legislation governing siting of petroleum pipelines be considered that would make the process more transparent for the public. Recommendation 8 recommends that the State consider creating an advisory committee on pipeline safety that would provide a public forum, and potentially public participation, in the oversight of pipeline safety. Recommendation 9 would create a single website that would contain information regarding petroleum pipelines.

Comments and Proposals Not Adopted by the Task Force

While the Task Force's recommendations address the most commonly proffered comments and proposals made by interested parties, certain proposals were not adopted by the Task Force. Specifically, two proposals were made by a number of interested parties that the Task Force does not recommend pursuing at this time:

1. Immediately shut down or "decommission" the Straits Pipeline:

A number of commentators suggested that the Straits Pipeline be immediately shut down (without identifying the precise legal mechanism for closure or alternative crude oil transportation modes), based primarily on three factors: the age of the pipeline, Enbridge's "track record," and the fact that it lies in the Great Lakes. These are all valid concerns, and would be factors that would be considered if the State were going to take the significant and consequential action of attempting to halt an ongoing, otherwise apparently lawful business operation.

The State has the available legal tools to address an imminent threat to the Great Lakes from the Straits Pipelines. These tools include the 1953 Easement, the common law public trust and public nuisance doctrines, and, potentially, state statutes. But the only legal mechanism to shut down the Straits Pipelines would be a court order. In order to convince a court to shut down Enbridge's Line 5 at the Straits, the State would (in simplified terms) have to prove to a court that there were clear violations of the 1953 Easement or state law, that there was an imminent threat that the Straits Pipelines would fail, and that such a threat outweighed any interest in Enbridge continuing to operate the Pipeline.

The Task Force believes the State has available legal tools to abate any immediate and actual threat of a spill from the Straits Pipelines. But at this juncture, particularly given the nearly unanimous view that there is *inadequate information* at this time to fully evaluate the risks presented by the Straits Pipelines, the Task Force does not find a basis for recommending that the State take the extraordinary action of seeking a court order to immediately shut down the Straits Pipelines.

2. Require Enbridge to apply for a permit or lease under Part 325, Great Lakes Bottomlands, of the Natural Resources and Environmental Protection Act (NREPA):

A number of commentators also suggested that Enbridge should be required to apply for a permit or lease under Part 325 of the NREPA. This statute incorporates some of the State's authority under the common law public trust doctrine, and, for example, requires leases or permits for the use or occupancy of Great Lakes bottomlands.

The original version of Part 325, the Submerged Lands Act, was enacted in 1955 as a mechanism to quiet title for business and individuals that had filled Great Lakes bottomlands, without authorization, and so were technically trespassers on State land. Two years prior to the enactment of the Submerged Lands Act, the Michigan legislature enacted PA 10 of 1953 that specifically authorized the then Conservation Commission to grant easements for pipelines on the Great Lakes bottomlands. Pursuant to that statute, the Conservation Commission entered into the 1953 Easement with Enbridge, authorizing the company to construct, operate and maintain the Straits Pipelines on Great Lakes bottomlands. So in 1955, the Submerged Land Act did not even apply to Enbridge as it had already been specifically authorized to place and operate the Straits Pipelines on bottomlands.

Over time the Submerged Land Act (which was recodified as Part 325 in 1994) was amended to cover additional activities on Great Lakes bottomlands and to require permits for them. And certain commentators have proffered the legal argument that the State has the authority to require Enbridge to apply to get another bottomlands conveyance or a permit, under Part 325, even though Enbridge's use of the existing easement for operation of the Straits Pipelines was authorized under 1953 PA 10. These commentators believe the State should exercise its authority under Part 325 because, they argue, there is a more rigorous conveyance or permitting process under Part 325 (as opposed to the process employed in 1953), which would include an analysis of alternatives, and an analysis of the potential environmental and other harms from operation of the Straits Pipelines, including a potential spill.

The Task Force does not believe it is necessary to take a position on the legal question of whether Enbridge can be required to apply for a Part 325 conveyance or permit for continued operation of its existing pipelines. It is unnecessary because, by implementing Straits Recommendations 1-4, the State can achieve the same result sought by the advocates of the Part 325 process. Through exercising its authority under the 1953 easement, the State can receive all of the information required to fully evaluate the likelihood and magnitude of any risks to the Straits, as well as available alternatives.

PETROLEUM PIPELINE TASK FORCE REPORT GLOSSARY

American Petroleum Institute (API) – The American Petroleum Institute is a national trade association that represents all aspects of America's oil and natural gas industry.

API Gravity Index – The API Gravity Index, devised by the American Petroleum Institute, measures density of petroleum, *i.e.,* how heavy or light a petroleum liquid is compared to water. The API Gravity Index is measured in degrees; if a substance is greater than 10 degrees, it floats in water, and if it is less than 10 degrees, it sinks.

Automatic Control Valve – A pipeline's automatic control valve is one that closes automatically in response to a pressure loss or a flow rate increase, either of which exceeds a predetermined set point.

Barrel – A measure of oil equaling 42 U.S. gallons.

Bitumen – Bitumen is the geological term that refers to the sticky, highly viscous semi-solid hydrocarbon present in most natural petroleum. It is also called pitch, resin and asphaltum. It is the remains of carbon-based plants and animals that have been transformed into an energy-rich "fossil fuel" through decay and decomposition underground.

Condensate – Condensate is a low-density, high-API Gravity liquid hydrocarbon phase that generally occurs in association with natural gas.

Crude Oil – Crude oil is liquid petroleum as it comes from out of the ground, as distinguished from the refined oils manufactured out of it. Crude oil is often measured by its density and is characterized as light, medium, heavy or extra heavy.

Dilbit (diluted bitumen crude oil)– Dilbit is a bitumen diluted with one or more lighter petroleum products. Diluting bitumen makes it easier to transport in pipelines.

Disbonded Coating - Disbonded coating refers to any loss of bond or adhesion between the protective coating applied to the outside of a steel pipe and the pipe itself. Disbondment can result from adhesive failure, chemical attack, mechanical damage, hydrogen concentrations or other causes.

Easement - An easement is an acquired privilege or right, such as a right-of-way, afforded a person or company to make limited use of another person's or company's real property. For example, the municipal water company may have an easement across your property for the purpose of installing and maintaining a water line. Similarly, oil and natural gas pipeline companies acquire easements from property owners to establish rights-of-way for construction and operation of their pipelines.

Extra Heavy Crude Oil – Extra heavy crude oil has an API gravity of less than 10 and sinks rather than floats in water. It is thicker and more resistant to flow than light oil, and generally requires the addition of a diluting agent to be transported by pipeline. The Alberta Tar Sands is an example of extra heavy crude.

Hazardous Liquid - A hazardous liquid is a liquid that is dangerous to human health or safety or the environment if used incorrectly or if not properly stored or contained. Pipeline safety regulations identify petroleum and petroleum products as hazardous liquids.

Hazardous Liquid Pipeline Safety Act (HLPSA) of 1979 – The HLPSA of 1979 authorized the Department of Transportation to regulate pipeline transportation of hazardous liquids, including crude oil and petroleum products.

Heavy Crude Oil – Heavy crude oil is oil with an API gravity of less than 20. The largest deposits of heavy crude are found in Canada and Venezuela.

Highly Volatile Liquids (HVLs) – a hazardous liquid which will form a vapor cloud when released to the atmosphere and which has a vapor pressure exceeding 276 kPa at 37.8° C (100° F). Examples include ethane, ethylene, propane, propylene, butylene, and anhydrous ammonia (NH3).

Horizontal (Directional) Drilling – drilling that starts from a single platform and reaches out horizontally to multiple oil reserves, as opposed to reaching downwards as in vertical drilling.

Hydraulic Fracturing (Fracking) – the process of pumping water, sand, and a minimal amount of chemicals into deep underground areas containing oil and applying pressure so that the rock layers crack and release the oil and gas.

Incident - As used in pipeline safety regulations, an incident is an event occurring on a natural gas pipeline for which the operator must make a report to the Office of Pipeline Safety. Events of similar magnitude affecting hazardous liquid pipelines are considered accidents.

Inline Inspection Tool (ILI Tool) - An inline inspection tool is a device used to perform inline inspection. An ILI tool is inserted into a pipeline and, usually, is pushed through the line by the pressure of the fluid being transported. As the ILI tool travels through the pipeline, it uses nondestructive testing techniques and technology to identify and record potential pipe defects or abnormalities. An ILI tool is also known as an Intelligent or Smart Pig.

Integrity Management Program - An integrity management program is a documented set of policies, processes, and procedures that are implemented by a company to ensure the integrity of a pipeline.

Interstate Pipeline - An interstate pipeline is a pipeline or that part of a pipeline that is used in transportation of hazardous liquids or natural gas in interstate or foreign commerce.

Intrastate Pipeline - An intrastate pipeline is a pipeline or that part of a pipeline that is entirely contained within one state's borders. An intrastate pipeline system may be under a state's regulatory jurisdiction as long as that state has a pipeline safety and inspection program that meets or exceeds the federal program. The state may opt to have its intrastate pipelines regulated by federal inspectors.

Light Crude Oil – Light crude oil is a liquid petroleum that has an API gravity of higher than 31 degrees. It flows freely at room temperature, and floats on water.

Enbridge Line 5 – Enbridge Line 5 is a 30-inch-diameter pipeline that carries light crude oil 645 miles from Superior, Wisconsin to Sarnia, Ontario. As it reaches the Straits of Mackinac, it splits into two 20-inch-diameter parallel pipelines buried onshore and tapering off deep underwater. The average capacity of Line 5 is 540,000 barrels per day of light crude oil, light synthetic crude, and natural gas liquids.

Enbridge Line 6B – Enbridge Line 6B is a pipeline that carries crude oil (includuing Alberta tar sands heavy crude) from Superior, Wisconsin south through Chicago and then northeast across the Lower Peninsula of Michigan to Sarnia, Ontario. In July 2010, the pipeline burst near Marshall, Michigan resulting in 840,000 gallons of heavy crude oil being released into the Talmadge Creek/Kalamazoo River – the largest inland oil spill in U.S. history.

Gross Negligence – Gross negligence is negligence that reaches the level of total or nearly total disregard for the health and safety of others or the consequences of one's actions.

Michigan Critical Incident Management System (MI CIMS) – The Michigan Critical Incident Management System is a state-of-the-art, web-based, secure, electronic information management system that supports planning/preparedness, response, recovery, and mitigation. It is operated by the Michigan State Police.

Michigan Petroleum Pipeline Task Force – The Michigan Petroleum Pipeline Task Force is a multi-agency government task force formed to examine pipelines transporting petroleum products in Michigan. It is co-chaired by Michigan Attorney General Bill Schuette and Michigan Department of Environment Quality (DEQ) Director Dan Wyant. The Task Force includes the Michigan Attorney General's office as well as DEQ, the Michigan Public Service Commission, Department of Natural Resources, DEQ's Office of the Great Lakes, Michigan Department of Transportation and Michigan State Police – Emergency Management and Homeland Security Division.

Michigan Public Service Commission (PSC) - The Michigan Public Service Commission is composed of three members appointed by the Governor with the advice and consent of the Senate. The PSC approves construction of new petroleum pipelines in Michigan under Public Act 16 of 1929. The hazardous liquids pipelines are built and maintained in accordance with the Minimum Federal Safety Standards which are promulgated and enforced by the Office of Pipeline Safety (OPS) within the U.S. Department of Transportation (USDOT). The rates and services of petroleum pipelines are determined by the Federal Energy Regulatory Commission (FERC) in Washington, D.C.

National Pipeline Mapping System (NPMS) - The National Pipeline Mapping System is a geographic information system (GIS) database that contains the locations and selected attributes of natural gas transmission lines, hazardous liquid trunklines, and liquefied natural gas (LNG) facilities operating in onshore and offshore territories of the United States. The NPMS is managed, operated, and maintained by the Office of Pipeline Safety (OPS) and is being developed under a joint government-industry effort involving OPS, other federal and state agencies, and the pipeline industry.

Natural Gas – Natural gas is a flammable gas found naturally underground and used as fuel.

Office of Pipeline Safety (OPS) - OPS is the agency within the U. S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) that is responsible for regulating the safety of design, construction, testing, operation, maintenance, and emergency response of U.S. oil and natural gas pipeline facilities.

Oil – Oil is crude petroleum and other hydrocarbons in liquid form.

Oil Pollution Act of 1990 (OPA) – The Oil Pollution Act of 1990 was signed into law in August 1990 largely in response to public concern following the Exxon Valdez oil spill. Its purpose was to improve the nation's ability to prevent and respond to oil spills by establishing provisions that expanded the federal government's ability, and provided the money and resources necessary, to respond to oil spills.

Petroleum – Petroleum is crude oil, condensate, natural gasoline, natural gas liquids, and liquefied petroleum gas.

Pig - Pig is a generic term signifying any independent, self-contained device, tool, or vehicle that is inserted into and moves through the interior of a pipeline for inspecting, dimensioning, or cleaning. These tools are commonly referred to as 'pigs' because of the occasional squealing noises that can be heard as they travel through the pipe.

Pipeline – Used broadly, pipeline includes all parts of those physical facilities through which gas, hazardous liquid, or carbon dioxide moves in transportation. Pipeline includes but is not limited to: line pipe, valves and other appurtenances attached to the pipe, pumping/compressor units and associated fabricated units, metering, regulating, and delivery stations, and holders and fabricated assemblies located therein, and breakout tanks.

Pipeline and Hazardous Materials Safety Administration (PHMSA) – The Pipeline and Hazardous Materials Safety Administration is one of ten agencies within the U.S. Department of Transportation (USDOT). PHMSA works to protect the American public and the environment by ensuring the safe and secure movement of hazardous materials to industry and consumers by all transportation modes, including the nation's pipelines. The creation of PHMSA (2004) provides USDOT a modal administration focused solely on its pipeline and hazardous materials transportation programs.

Pipeline Integrity - Integrity is being of sound and unimpaired condition. Pipeline integrity assures that the pipeline is in sound and unimpaired condition and can safely carry out its function under the conditions and parameters for which it was designed.

Pump - A pump is a mechanical device used to increase the pressure of the oil in a pipeline. Increased pressure is used to move the oil along through the pipeline by pushing it towards an area of lower pressure.

Pumping Station - A pumping station is a facility that houses the pumps used to move oil along through a pipeline.

Refined Petroleum Product – A refined petroleum product is crude oil that has been refined into a product such as gasoline, kerosene, or lubricating oil.

Synthetic Crude Oil (Syncrude) – Synthetic crude oil, or syncrude, is a crude oil substitute, having the same hydrocarbon formation as crude oil, that is created by taking naturally occurring substances such as oil shale and oil sands (containing bitumen) and applying heat, pressure, and physical manipulation.

Tar Sand (also called **bituminous sand or oil sand)**) – Tar sand is a deposit of loose sand or partially consolidated sandstone that is saturated with highly viscous bitumen.

Viscosity – Viscosity refers to the degree to which a fluid resists flow, i.e. a change in shape or movement. It can be thought of generally as thickness.

Wellhead - Wellhead refers to the point at which oil and natural gas is extracted from the ground.

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