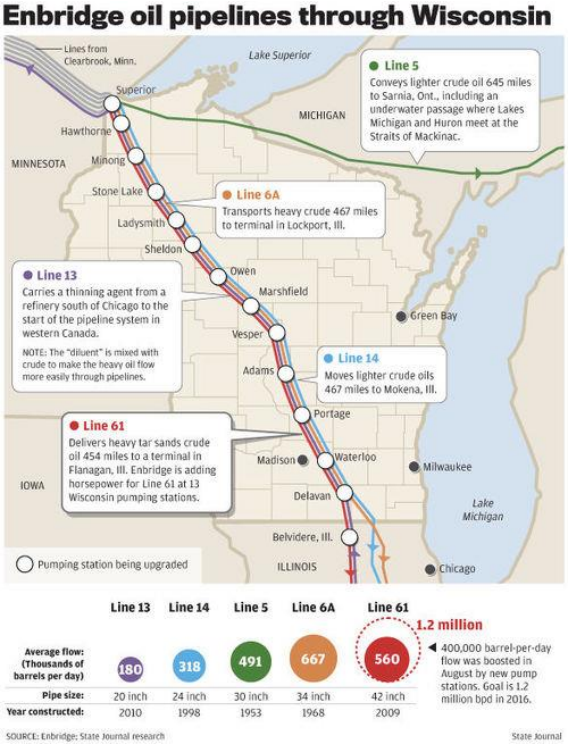
Tar Sands: Why Should I Care?

Tar sands (bitumen) is extracted in Canada and is transported by pipeline through Minnesota and Wisconsin and points further south. Tar sands and tar sands pipelines can have a major impact on our economy, health and environment. By understanding tar sands and tar sands pipelines, we can work together to protect Wisconsin's future.

What are tar sands?

- Tar sands (bitumen) is a thick, sticky form of crude oil. The largest tar sands deposits in the world are in Alberta, Canada. Tar sands are extracted in Alberta and transported via pipelines to refineries in the United States. A major pipeline route is through Wisconsin.
- Tar sands oil is so thick that it can't be extracted by traditional methods.[i]
    - Some tar sands are extracted by surface mining. This results in the clear-cutting of Canadian boreal forests, the removal of peat and topsoil, and the development of huge "tailings ponds" of polluted water that is deadly to birds that land in them.
    - Deeper tar sands deposits are extracted by using steam to melt the tar sands underground so they can be pumped to the surface. This extraction method requires large amounts of water and energy.
- Because tar sands are so thick, they will not flow through pipelines without processing. A "diluent" is added to make them fluid enough to move through a pipeline. Diluent is also called "natural gas condensate" and contains many toxic chemicals, including benzene, a known carcinogen.[ii] The diluted tar sands are known as "**dilbit**" (diluted bitumen). [iii]

Where are tar sands pipelines in Wisconsin?



Wisconsin is a major route for transporting tar sands oil from Canada. Much tar sands oil travels through the Midwest, some to Gulf Coast refineries for export onto the world market.
Line 61 is the primary tar sands pipeline in Wisconsin.

Line 61 is owned and operated by Enbridge, a private Canadian-based energy infrastructure company. Enbridge is one of the world's largest publicly traded energy companies. The Enbridge website states that the company is valued at $166 billion.

- Line 61originates at Enbridge's Superior Terminal in Superior, WI, and terminates at Flanagan, IL. It passes through 16 Wisconsin counties.
- It currently carries 890,000 barrels per day. Enbridge is expanding its capacity to 1.2 million barrels per day (50.4 million gallons daily).[iv] *1.2 million barrels per day is 45% more than the planned capacity of the Keystone XL Pipeline, and nearly triple the capacity of the Dakota Access Pipeline.*

- Line 13, a diluent pipeline, in the same corridor as Line 61, runs north. When tar sands oil is refined, the diluent is removed, recycled, and returned to Alberta through Line 13
- According to material provided to investors, Enbridge is considering constructing an *additional* tar sands pipeline—Line 66 (line 61 "Twin")—adjacent to the existing pipeline corridor.

Tar Sands and Pipeline Questions and Answers

Tar sands pipelines have generated many questions. Here are some commonly asked questions, along with answers based on timely data and research. Further information supporting this piece can be found at www.350madison.org.

The questions and answers are divided into six categories:

- Pipeline safety
- How do tar sands pipelines affect the Wisconsin economy?
- How do tar sands pipelines affect human health?
- How do tar sands pipelines affect the environment?
- What is the impact of tar sands oil on climate change?
- What is the relationship of tar sands oil to national energy security?

Q&A—Pipeline Safety

What is the risk of transporting tar sands oil through pipelines?	The main risk of transporting tar sands oil (and diluent) through pipelines is that the pipeline will rupture, spreading large quantities of tar sands on land and in waterways and releasing volatile chemicals into the air. (See Figure 1.)
How common are Enbridge pipeline incidents?	*The Pipelines and Hazardous Materials Safety Administration (PHMSA) refers to "incidents" rather than "accidents" but the terms are often used interchangeably.*

	Federal rules define pipeline accidents as an unintended explosion or fire, release of 5 gallons or more hazardous liquid, death, or injury requiring hospitalization, or property damage more than $50,000. [v] From January 2006 through February 2017, 112 Enbridge pipeline incidents were reported in the US, with 44,580 barrels spilled. 19% of the spilled oil was not recovered, and there was $928 million in property damages. Four people lost their lives, and three were injured. [vi] During the same period in Wisconsin, Enbridge reported 33 pipeline incidents, with 8471 barrels spilled. One third of the spilled oil was not recovered, and there was $12.7million in property damage.
What are some examples of tar sands pipeline incidents?	Here are a few examples of recent tar sand pipeline incidents: • **Kalamazoo River, Michigan**. In July 2010, more than 1 million gallons of tar sands oil spilled from an Enbridge pipeline into the Kalamazoo River in Michigan. A 35-mile stretch of the Kalamazoo River was closed for almost 2 years because of the spill, and the cleanup required approximately five years.[vii] • **Mayflower, Arkansas.** In 2013, the Pegasus pipeline ruptured, spilling 134,000 gallons of tar sands oil. The oil flowed through residential streets, damaging houses, and may have reached a nearby reservoir.[viii] • **North Saskatchewan River, Canada.** In 2016, a Husky Energy pipeline ruptured in the river, spilling 200,000 gallons of tar sands crude. The water supply for the nearby town of Prince Albert was contaminated. • **Freeman, South Dakota.** In 2016, the Keystone 1 pipeline spilled 16,800 gallons of tar sands crude, which was not detected by the pipeline's spill detection technology. [ix]
What are the specifics of major Enbridge spills in Wisconsin?	Major Enbridge Spills in Wisconsin

Year	Location	Size of spill
2003	Nemadji River in Superior	189,000 gallons
2007	Farm field in Clark County	50,000 gallons
2007	Exeland In Rusk County	176,000 gallons

	2011	Grand Marsh, Adams County	72,618 gallons
Has Enbridge complied with Wisconsin safety rules?	In 2008, the WI Department of Natural Resources charged Enbridge Energy with more than 100 environmental violations relating to the construction of a pipeline. The agency said that Enbridge workers illegally cleared and disrupted wooded wetlands and were responsible for other actions that resulted in discharging sediment into waterways. Enbridge settled the charges by agreeing to pay $1.1 million in penalties.		
Isn't it safer to transport oil by pipeline than by train or ships/barges?	The risks are different: there are more spills by rail, but pipeline spills tend to be larger, and spills in navigable waterways (e.g. Great Lakes) pose grave risks to those waterways. However, it is unlikely that trains and ships/barges would be used to any extent to transport tar sands oil, due to the remote location of the extraction site and the volume of tar sands being extracted.		
Will pipeline leak detection technology help prevent major tar sands oil spills?	Between 2002 and July 2012, remote sensors detected only 5 percent of the nation's pipeline spills. Most of the spills were reported by company employees or contractors at the scene or by the public, often after considerable damage had already occurred.		

Q&A: How do tar sands pipelines affect the Wisconsin economy?

Do pipelines provide jobs?	There are temporary construction jobs when pipelines are built or when new pumping stations need to be built to expand capacity. Enbridge's website claims it provided 500 temporary construction jobs in Wisconsin over an unspecified period of years. The Enbridge website does not refer to permanent Wisconsin jobs associated with pipelines. For the Keystone Pipeline, the six states along the pipeline route would be expected to gain a total of 20 permanent pipeline operation jobs, according to the U.S. State Department.[x]
What is the impact of pipelines on agriculture?	Agricultural land is appropriated for pipeline corridors. Since 2015, Wisconsin law allows Enbridge to use eminent domain to obtain land for its pipelines if landowners do not agree to sell easements. Pipeline construction can harm the land. Spills can cause significant, long-term damage to farmland. Spills may pollute aquifers that are crucial to the agricultural economy.

What is the impact of pipelines on manufacturing?	Clean water is important for food processing, beer production, and other manufacturing operations. Pipeline spills have the potential to pollute water that is used in the manufacturing process.
What is the impact of pipelines on tourism?	Pipelines go through waterways and other sensitive natural areas that are used for tourism and recreation. Spills can damage or destroy these important natural areas.

Q&A: How do tar sand pipelines affect human health?

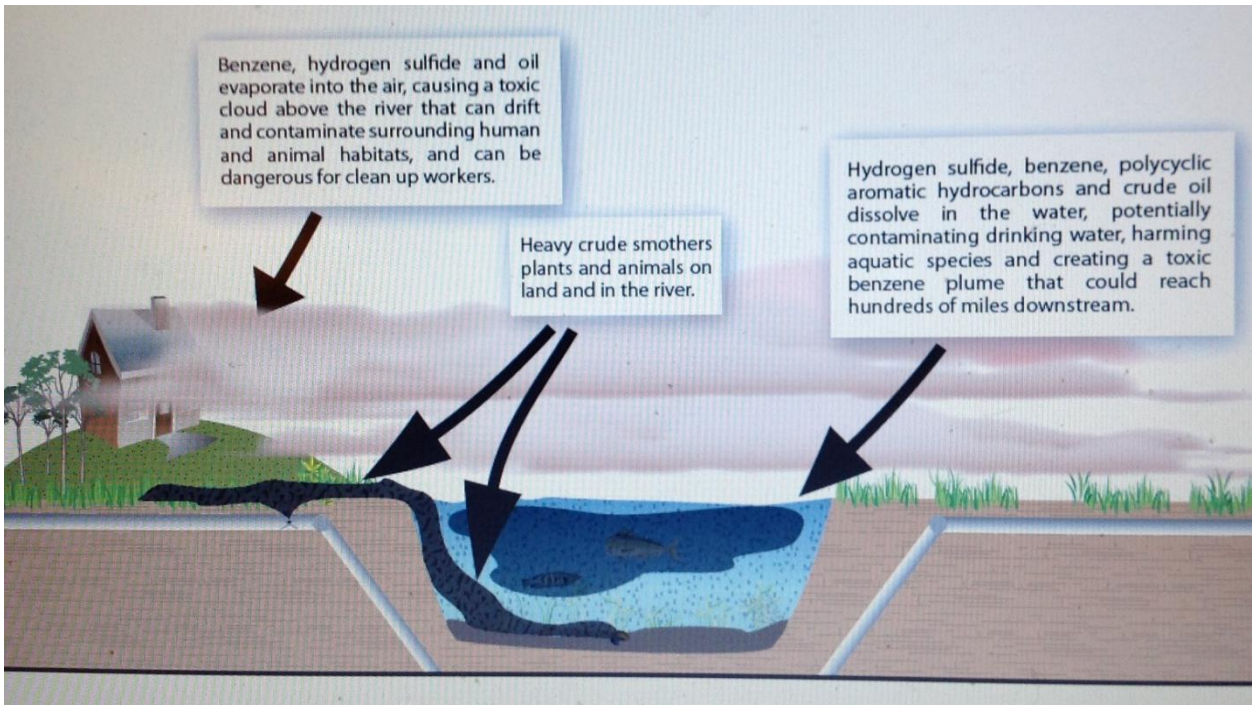
Why are there health concerns about tar sands pipelines?	Many chemicals in dilbit are dangerous to human health. Some, such as benzene, are known carcinogens. When there is a pipeline rupture, these chemicals are released into the atmosphere, penetrate the soil, or enter groundwater.
Have people become ill because of tar sands spills?	Yes. The Enbridge Kalamazoo River pipeline spill provides a good example of how pipeline spills can affect human health. The spill forced nearby residents to flee their homes, and over 300 people suffered from immediate illness due to chemicals in the air. Almost sixty percent of people living near the spill experienced respiratory, gastrointestinal, and neurological symptoms consistent with acute exposure to benzene and other petroleum-related chemicals. Long-term health effects are unknown.
What is known about the long-term effects of tar sands oil?	Communities in Alberta near tar sands extraction sites have experienced an upsurge of rare cancers. Three recent studies confirm that tar sands processing near Fort McMurray and Edmonton, Alberta is resulting in the release of cancer-causing chemicals, and higher rates of certain cancers associated with exposure to petrochemicals have been observed in those areas. [xi]

Q&A: How do tar sand pipelines affect the environment?

How hard is it to clean up tar sands oil spills?	A 2016 National Academy of Sciences study concluded that dilbit differs from conventional crude oil, since it sinks into waterways, coating plants, animals and the bottom of waterways.[xii] Standard cleanup techniques are not effective. There are no reliably effective ways to clean up dilbit at present, and it cannot be guaranteed that such methods will be developed. Figure 1 illustrates how tar sands and chemical vapors can affect the environment.
How much does tar sands oil clean-up cost?	It costs about 14.5 times as much to clean up a tar sands oil spill than to clean up a conventional oil spill ($29,000 per

	barrel for tar sands vs. $2,000/barrel for light crude.)[xiii] The Kalamazoo River spill has cost $1.2 billion to date.
Who is responsible for environment clean-up costs?	The pipeline owner is legally liable for the costs associated with spill containment, cleanup, and resulting damages, whether from company funds or insurance funds. However, inadequate types and quantities of insurance, litigation by insurers, and uncertainly regarding the long-term economic health of pipeline companies (pipelines often last 50 or more years), can put local taxpayers at risk for cleanup and restoration.[xiv]

Figure 1.



Source: https://tinyurl.com/y8lswkvj

Q&A: What is the impact of tar sands oil on climate change?

How does tar sands oil contribute to climate change?	Because tar sands oil extraction and processing releases more carbon into the atmosphere than conventional oil, it has a greater impact on climate change**.** Emissions from tar sands extraction and upgrading are between 3.2 and 4.5 times higher than the equivalent emissions from conventional oil produced in North America. On a lifecycle basis, ("well to wheel') the average gallon of tar sands bitumen-derived fuel has between 14 and 37 percent more

	greenhouse gas emissions than the average gallon of fuel from conventional oil. [xv]
How does peat removal during tar sands extraction contribute to climate change?	Mining of tar sands involves removing peat in the Albertan boreal forests. Peat is important for slowing the onset of climate change, since it absorbs CO2 and prevents its release into the atmosphere. Peat is composed of about 50 percent carbon, and when the peat is removed, the carbon is released into the atmosphere. [xvi]
How does petcoke, a tar sands byproduct, contribute to climate change?	Petroleum coke (petcoke) is increasingly being burned instead of coal. Petcoke emits 53.6 percent more CO_2 per ton than coal and 7.2 percent more CO_2 per unit of energy when compared to the most common types of coal in use. [xvii]

Q&A: What is the relationship of tar sands oil to national energy security?

Tar sands oil comes from Canada. Isn't this better for the US than imported oil from the Middle East?	The US depends on energy from a variety of sources, and low prices reflect there is no oil shortage in the US. Most tar sands from Canada are refined and used here, but the US produces large amounts of several grades of oil and exports a significant fraction onto the world market. U.S. shipments abroad surpassed 1 million barrels a day in February 2017. [xviii] With the current slump in oil prices, coupled with the high cost of refining tar sands for export, most tar sands is now refined and used in domestic markets. However, this in turn now allows for more export of lighter crude oil or refined products onto the world market. Thus, Canadian tar sands flowing through Wisconsin does not end up providing for Wisconsin or US "energy security" in a meaningful way.
Don't we need tar sands oil for continued economic growth?	The nation's pipeline network is more than adequate to meet current needs. North American supplies of oil are plentiful, and significant price increases are not expected. There are current surpluses of oil worldwide.[xix]
I drive a car and use lots of oil in my daily life. How can I complain about tar sands oil?	Many people are struggling to balance their life choices and energy use. People are encouraged to make choices such as driving cars with good gas mileage, walking, biking or taking mass transit.
How can the US improve its energy security without relying on tar sands oil?	The US can achieve energy security and protect against climate change by significantly reducing its use of tar sands and becoming less dependent on fossil fuels overall. This will require us to develop renewable energy sources, increase energy conservation, and price carbon to reflect its environmental costs.

How can I learn more?

The 350 Madison website (www.350madison.org) includes links to numerous references about tar sands. Links to sources used in this document can also be found on the 350 Madison website.

How can I get involved?

350Madison **(**www.350madison.org**)** and the Wisconsin Chapter of the Sierra Club (http://www.sierraclub.org/wisconsin) continue efforts to reduce tar sands use and infrastructure.

---

i https://en.wikipedia.org/wiki/Oil_sands

ii https://en.wikipedia.org/wiki/Benzene
https://emergency.cdc.gov/agent/benzene/basics/facts.asp
https://insideclimatenews.org/news/20130618/what-sickens-people-oil-spills-and-how-badly-anybodys-guess

iii https://en.wikipedia.org/wiki/Dilbit

iv http://www.enbridge.com/projects-and-infrastructure/projects/line-61-upgrade-project-phase-2

v https://tinyurl.com/yc3l6th7

vi https://tinyurl.com/y7j2snfy

vii https://www.epa.gov/enbridge-spill-michigan

viii https://en.wikipedia.org/wiki/2013_Mayflower_oil_spill

ix time.com/4292856/south-dakota-oil-spill/

x https://www.ilr.cornell.edu/sites/ilr.cornell.edu/files/GLI_Impact-of-Tar-Sands-Pipeline-Spills.pdf

xi https://www.nrdc.org/sites/default/files/tar-sands-health-effects-IB.pdf]

xii https://www.nap.edu/read/21834/chapter/1

xiii https://tinyurl.com/y92rdmpt

xiv https://tinyurl.com/yc35fgqz

xv http://priceofoil.org/content/uploads/2013/01/OCI.Petcoke.FINALSCREEN.pdf

xvi https://www.scientificamerican.com/article/peat-and-repeat-rewetting-carbon-sinks/

xvii http://priceofoil.org/content/uploads/2013/01/OCI.Petcoke.FINALSCREEN.pdf

xviii http://www.nola.com/business/index.ssf/2017/06/gulf_coast_shifts_from_refinin.html

xix https://www.usatoday.com/story/money/2017/03/09/crude-oil-prices-fall-below-50-us-stockpiles-rise/98951274/