Health Impacts and other Unpleasant Tar Sands Truths

Mary Beth Elliott

350 Madison Tar Sands Lead

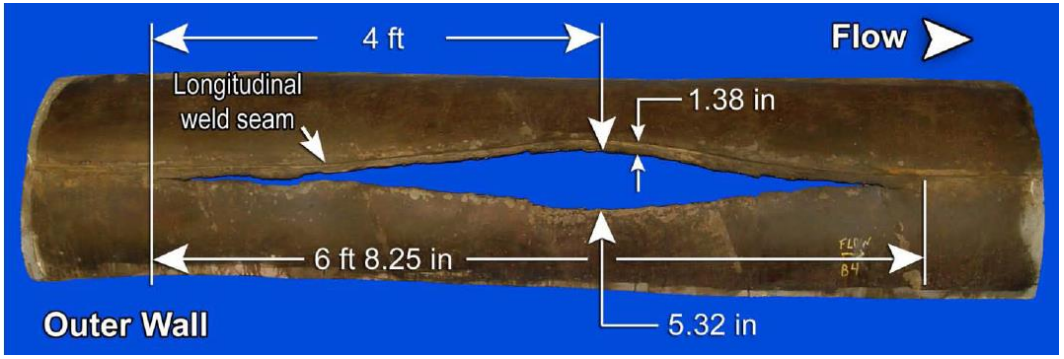
gutsugua@gmail.com

- I will send URLs or pdfs to anyone who requests

Enbridge Energy is placing Wisconsin at risk

Enbridge “highlights”

- Enbridge pipeline in WI (line 61):
  - Will carry unprecedented 2.1 million gallons/hour
  - 583 gallons per second
  - Contains dangerous soup of added chemicals
- The Kalamazoo spill is still not cleaned up (after $1.2 B)
- Health effects from tar sands spills are concerning
- Enbridge does not carry insurance for environmental restoration post-spill and does not appear to have sufficient funds in-house either



Six foot gash in Kalamazoo pipe

National Transportation Safety Board. 2012. Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, Michigan, July 25, 2010. Pipeline Accident Report NTSB/PAR-12/01. Washington, D.C.

Cleanup problems of tar sands at Kalamazoo spill

Once cleanup crews locate submerged oil, it was difficult to remove **without destroying the riverbed.**

Steve Hamilton, Professor at Michigan State University, “it sticks to surfaces of plants and debris that made a tarry mess that largely had to be manually removed."

“It is so incredibly difficult to remove submerged oil from a complex river, extending over nearly 40 miles."

NRDC: The Kalamazoo tar sands spill cost $29,000 a barrel to clean up, vs $2,000/barrel for “traditional” crude oil

We've all seen these types of pictures…

But what about risks to people?

Tar sands and diluents are not a “natural” part of the above-ground environment!

How much health risk does a tar sands spill pose?

- Not like drugs or diseases, where can make a study
- Long term risks harder to assess than short term
- Best evidence: from those exposed….but who is collecting this evidence and studying?
  - Almost no one
  - Why not?? Need for UNBIASED immediate and long term assessment

Chemicals used to dilute tar sands

("diluent")

(data from Enbridge)

CHEMICAL NAME	PERCENT	SAFETY LIMIT ppm *
Natural Gas Condensates/ Light Hydrocarbons of Petroleum	100	N/A
1t,2-dimethylcyclopentane	0.4 - 1.1	None
2,3-dimethylbutane	0.8 - 1.8	100
2-methylhexane	1.3 - 1.7	None
2-methylpentane	5.6 – 9.6	100
3-methylhexane	1.5 – 1.9	None
3-methylpentane	3.3 – 5.6	100
Benzene	1.0 – 1.8	0.1
cyclohexane	1.4 – 3.1	300
cyclopentane	1.0 – 1.9	600
i-pentane	20.1 – 24.0	120
methylcyclohexane	1.2 – 3.2	400
methylcyclopentane	1.2 – 3.6	None
n-butane	0.6 – 2.4	800
n-heptane	2.3 – 3.2	85

..... and more

* Per NIOSH (National Institute for Occupational Safety and Health) for exposure limit over 8 hours (time-weighted average)

http://www.cdc.gov/niosh/idlh/71432.html

http://www.ilpi.com/msds/ref/pel.html

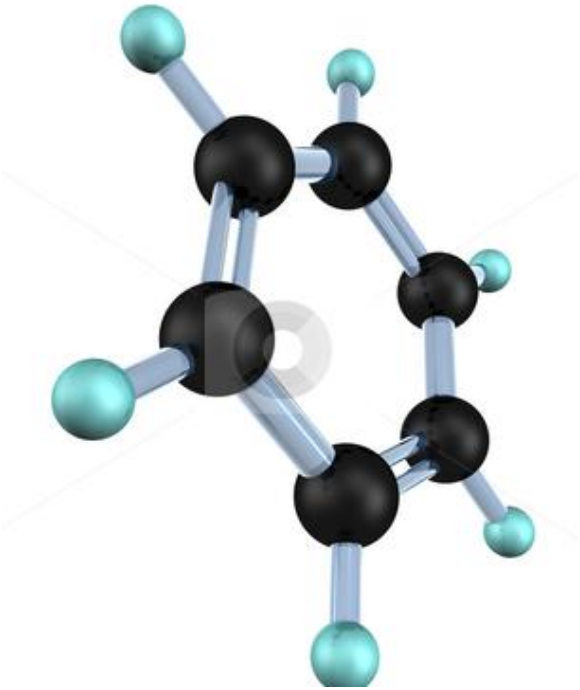
25% to 30% of what flows in a tar sands pipeline IS THE DILUENT

and would be about 3 gallons/second of benzene alone!

Benzene…

…is very volatile

…is a carcinogen



…is a teratogen

… and has acute effects

Babies are at high risk

Acute symptoms* in exposed vs comparison communities after Kalamazoo spill

	Total		Comparison	
	N	%	N	%
Number/percent without any Symptoms	230	41.8%	131	95.6%
Number/percent with any Symptom	320	58.2%	6	4.4%
1 symptom	137	42.8%	5	83.3%
2-3 symptoms	143	44.7%	1	16.7%
4+ symptoms	40	12.5%	0	0.0%

BUT…Riki Ott: “Very few people are looking at the public health implications of oil disasters. If the full human health costs [of these accidents] were known, it would change our energy future immediately.”

**Most common: Headache breathing difficulty, cough, nausea and vomiting
Acute Health Effects of the Enbridge Oil Spill, MI Dept of Community Health

Health effects at BP Gulf Oil disaster and others

- Headache, dizziness, nausea, vomiting, cough, respiratory distress, eye irritation, skin irritation or allergic response, phototoxicity

- Accumulation of heavy metals in fish, potential risk from eating fish over the long term

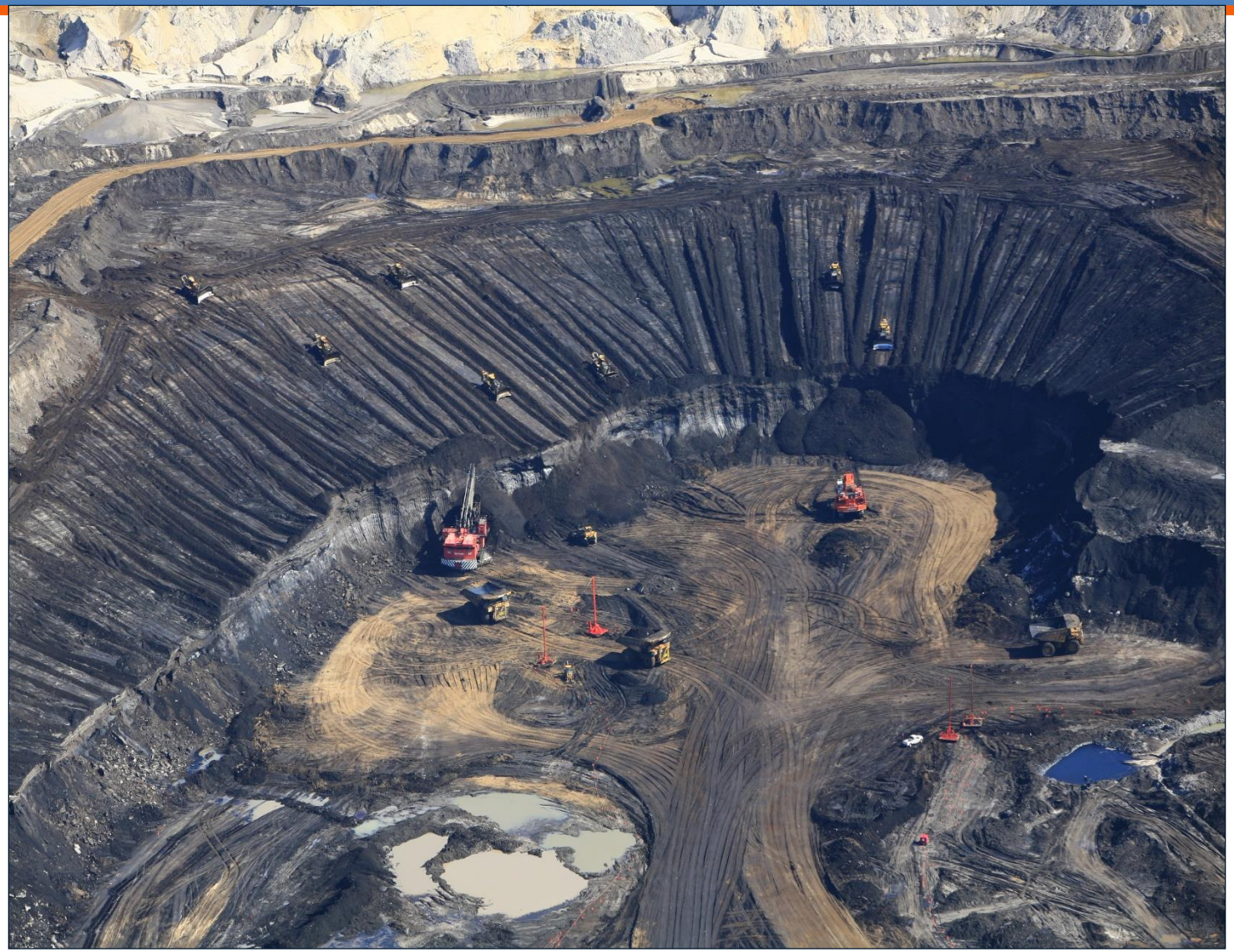
For cleanup crews, on top of acute physical effects:

- Depression, PTSD, anxiety
  - Up to six years afterward

- Dispersants prolongs the presence of oil in the environment…

Health Effects of the Gulf Oil Spill. *JAMA, 2010*

What about more intense and long-term exposure?



What about more intense and long-term exposure?

People living in the industrial tar sands development zone in Alberta—

- Longer and greater exposure to toxins, including benzene, heavy metals and hydrogen sulfide

- Elevated rates of blood and solid organ cancers observed

from All Risk, No Reward (Sierra Club, others)

NRDC study, Tar Sands Crude Oil: Health Effects of a Dirty and Destructive Fuel

- National Academy of Sciences: expanding tar sands activities increased air pollution near Fort McMurray and just outside Edmonton, Alberta.

- Environmental impact studies by the tar sands industry systemically underestimated this pollution.

http://switchboard.nrdc.org/blogs/ddroitsch/mounting_evidence_that_tar_san.html

Tar Sands Crude Oil: Health Effects of a Dirty and Destructive Fuel

- Some Alberta water supplies exceed standards for chemicals linked to cancer, genetic damage, birth defects, and organ damage.
- Tar sands development is increasing methylmecury in Alberta's waterways
- Rising cancer rates in First Nations communities:
  - increased incidences of cancer in Fort Chipewyan, Alberta 1995-2009. Increased cancer rate from 1995 to 2009: 30% higher than expected.
  - Dr. John O'Conner, an Alberta physician, has long called for further study of this.
  - But no independent study of these cancers despite repeated called by First Nations

http://switchboard.nrdc.org/blogs/ddroitsch/mounting_evidence_that_tar_san.html

Treasures can be wiped out…on the Gulf Coast… on in the Midwest

Interesting quote

Dr. Edward Trapido, cancer specialist and research studying cleanup crews and their families: "Oil is not going away, and whatever kind of energy it is - whether it's nuclear, whether it's coal or oil - all of these have had problems in recent years where people get exposed to it."

But, one might say, Yes, even from renewables….

What about windburn, and sunburn? ☺

Thank you for your attention!

References and Extra Slides

References

Health Risk of Tar Sands Oil Spill, by Physicians for Social Responsibility (handout at March 19 meeting)
http://tinyurl.com/mnyvtxc

Solomon, GM, Janssen S. Health Effects of the Gulf Oil Spill. *JAMA (Journal of the American Medical Association).*2010; 304:1118-1119. Please request pdf from Mary Beth Elliott (gutsugua@gmail.com)

Acute Health Effects of the Enbridge Oil Spill from the Michigan Department of Community Health
http://tinyurl.com/q7227oz

ALL RISK, NO REWARD: THE ALBERTA CLIPPER TAR SANDS PIPELINE EXPANSION
(see page 2 for Public Health Concerns from Tar Sands, for dangers for those with higher levels exposures, such as workers and those living in tar sands development zones)
http://tinyurl.com/o6be47k

Composition of Enbridge tar sands diluting chemicals (diluents) and of various crude oils. See Dane County web site

http://tinyurl.com/mkombzy

Look under Enbridge letters (currently attachment 15; chemicals start on page 26 of the 184 pages of letters)

References

- The National Academy of Science reports can be found at http://www.nap.edu/catalog/21834/spills-of-diluted-bitumen-from-pipelines-a-comparative-study-of and http://www.rsc-src.ca/en/expert-panels/rsc-reports/behaviour-and-environmental-impacts-crude-oil-released-into-aqueous

Risk vs what benefit?

NRDC: Two-thirds of tar sands refined in Gulf Coast refineries are exported from the Gulf Coast*

"This is a viable opportunity for Canadian barrels to get out into the wider world. It's another source of revenue other than big brother United States." *Martin King, FirstEnergy Capital analyst, April 2014*

"**Exports: Last Demand Standing" ****

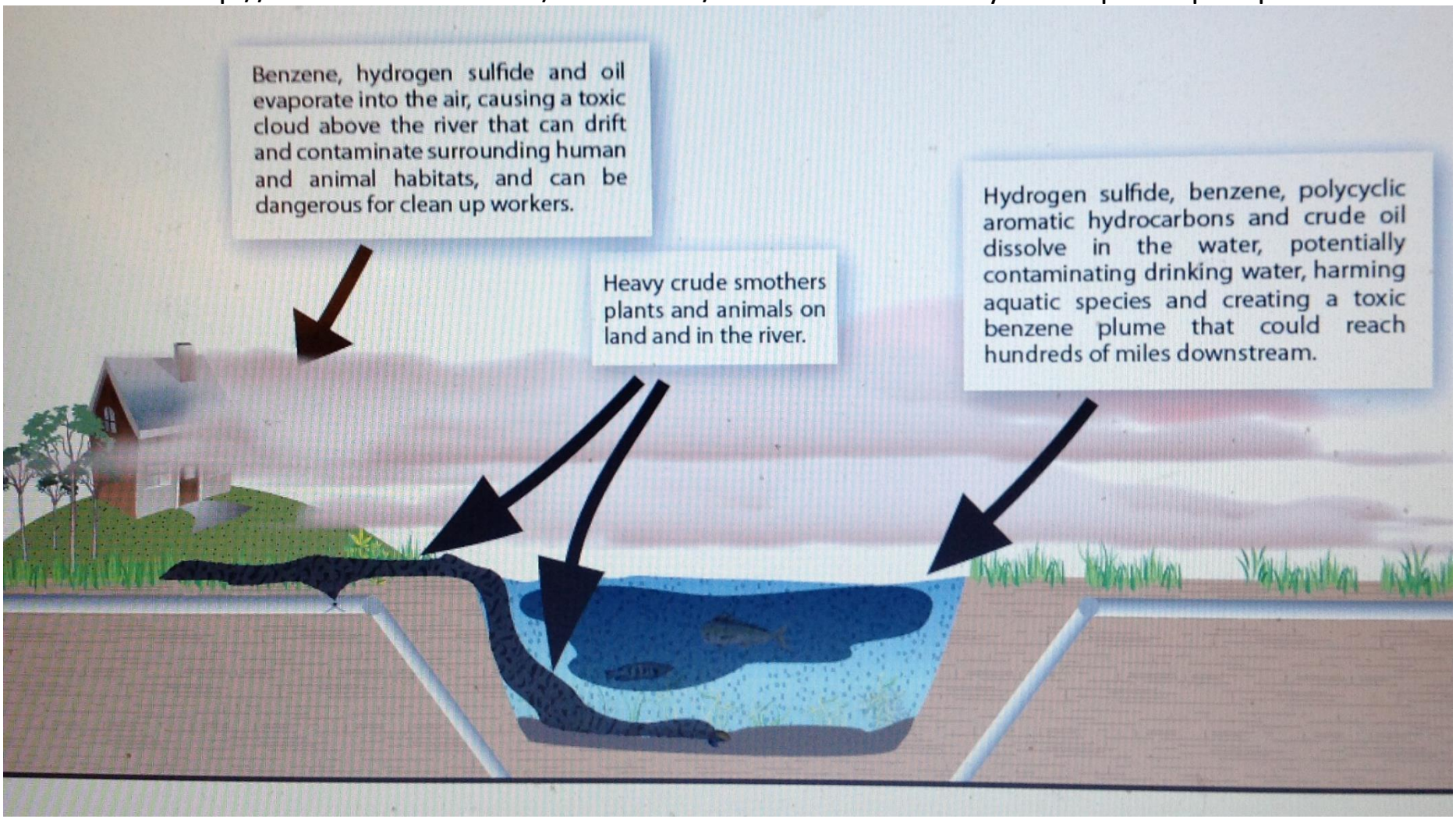
- Inventory builds are implying the US is oversupplied by 800 Mb/d
- Traditional sources of demand in years past (displacing imports, higher refinery runs) have largely run their course
- The massive oversupply situation at current production levels provides a sobering narrative on the prospects for further growth in US production
- Unrestricted exports of crude provide the last significant source of demand

*http://switchboard.nrdc.org/blogs/aswift/three_facts_you_should_know_ab.html

** Bentex Market alert, april 2015

Tar sands spills in water can pose a serious threat

http://watercenter.unl.edu/downloads/2011-Worst-case-Keystone-spills-report.pdf



National Academy of Sciences Study on Dilbit

"..For this reason, spills of diluted bitumen pose particular challenges when they reach water bodies.

In some cases, the residues can submerge or sink to the bottom of the water body.

Importantly, the density of the residual oil does not necessarily need to reach or exceed the density of the surrounding water for this to occur. The crude oil may combine with particles present in the water column to submerge, and then remain in suspension or sink."

NAS study

…" In cases where traditional removal or containment techniques are not immediately successful, the possibility of submerged and sunken oil increases.

This situation is highly problematic for spill response because

1) ***there are few effective techniques for detection, containment, and recovery of oil that is submerged in the water column****, and*

2) ***available techniques for responding to oil that has sunken to the bottom have variable effectiveness depending on the spill conditions.***

National Academy of Sciences Study on Dilbit

"Immediately following a spill, the **Environmental Processes, Behavior, and Toxicity of Diluted Bitumen** are similar to those of other commonly transported crudes.

Beginning immediately after a spill, however, exposure to the environment begins to change spilled diluted bitumen through various weathering processe.

For any crude oil spill, lighter, volatile compounds begin to evaporate promptly; in the case of diluted bitumen, a dense, viscous material with a strong tendency to adhere to surfaces begins to form as a residue…

“Cars on public roads must be insured. Pipelines, with their history of leaks and explosions? Not so much.”

By Peter Gorman
http://www.fwweekly.com/2013/06/12/a-perilous-grid/