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The Dilbit Disaster: Inside The Biggest Oil Spill You've Never Heard Of, Part 1

By Elizabeth McGowan and Lisa Song, InsideClimate News

Jun 26, 2012

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Inside the Dilbit Disaster, Part 1

A black goo stopped just 10 feet from the metal cap that marked his drinking water well. Walking on the tarry mess was like stepping on chewing gum.

By Elizabeth McGowan and Lisa Song, InsideClimate News

This is part 1 of a three-part series. You can read it all on [an eBook now](#) [2].

MARSHALL, Mich.—An acrid stench had already enveloped John LaForge's five-bedroom house when he opened the door just after 6 a.m. on July 26, 2010. By the time the building contractor hurried the few feet to the refuge of his Dodge Ram pickup, his throat was stinging and his head was throbbing.

LaForge was at work excavating a basement when his wife called a couple of hours later. The odor had become even more sickening, Lorraine told him. And a fire truck was parked in front of their house, where Talmadge Creek rippled toward the Kalamazoo River.

LaForge headed home. By the time he arrived, the stink was so intense that he could barely keep his breakfast down.

Something else was wrong, too.

Water from the usually tame creek had inundated his yard, the way it often did after heavy rains. But this time a black goo coated swaths of his golf course-green grass. It

stopped just 10 feet from the metal cap that marked his drinking water well. Walking on the tarry mess was like stepping on chewing gum.

LaForge said he was stooped over the creek, looking for the source of the gunk, when two men in a white truck marked Enbridge pulled up just before 10 a.m. One rushed to LaForge's open front door and disappeared inside with an air-monitoring instrument.

The man emerged less than a minute later, and uttered the words that still haunt LaForge today: It's not safe to be here. You're going to have to leave your house. Now.

John and Lorraine LaForge, their grown daughter and one of the three grandchildren living with them at the time piled into the pickup and their minivan as fast as they could, given Lorraine's health problems. They didn't pause to grab toys for the baby or extra clothes for the two children at preschool. They didn't even lock up the house.

Within a half hour, they had checked into two rooms at a Holiday Inn Express, which the family of six would call home for the next 61 days.

Their lives had been turned upside down by the first major spill of Canadian diluted bitumen [3] in a U.S. river. Diluted bitumen is the same type of oil that could someday be carried by the much-debated Keystone XL pipeline [4]. If that project is approved, the section that runs through Nebraska will cross the Ogallala aquifer, which supplies drinking water for eight states as well as 30 percent of the nation's irrigation water.

"People don't realize how your life can change overnight," LaForge told an InsideClimate News reporter as they drove slowly past his empty house in November 2011. "It has been devastating."

* * * *

The spill happened in Marshall, a community of 7,400 in southwestern Michigan. At least 1 million gallons of oil blackened more than two miles of Talmadge Creek and almost 36 miles of the Kalamazoo River, and oil is still showing up 23 months later, as the cleanup continues. About 150 families have been permanently relocated and most of the tainted stretch of river between Marshall and Kalamazoo remained closed to the public until June 21 [5].

The accident was triggered by a six-and-a-half foot tear in 6B, a 30-inch carbon steel pipeline operated by Enbridge Energy Partners, the U.S. branch of Enbridge Inc., Canada's largest transporter of crude oil. With Enbridge's costs already totaling more than \$765 million [6], it is the most expensive oil pipeline spill since the U.S. government began keeping records in 1968. An independent federal agency, the National Transportation Safety Board, is investigating the accident [7], and the U.S. Environmental Protection Agency has launched criminal and civil probes.

Despite the scope of the damage, the Enbridge spill hasn't attracted much national attention, perhaps because it occurred just 10 days after oil stopped spewing from BP's Macondo well in the Gulf of Mexico, which had ruptured three months earlier. Early reports about the Enbridge spill also downplayed its seriousness. Just about everybody, including the EPA officials who rushed to Marshall, expected the mess to be cleaned up in a couple of months.

What the EPA didn't know then, however, was that 6B was carrying bitumen, the dirtiest, stickiest oil on the market.

Bitumen is so thick—about the consistency of peanut butter—that it doesn't flow from a well like the crude oil found in most of the nation's pipelines. Instead the tarry resin is either steamed or strip-mined from sandy soil. Then it is thinned with large quantities of liquid chemicals so it can be pumped through pipelines. These diluents usually include benzene, a known human carcinogen. At this point it becomes diluted bitumen, or dilbit.

Some environmental organizations say dilbit is so acidic and abrasive that it's more likely to corrode and weaken pipes than conventional oil. The oil industry disputes that hypothesis. It says dilbit is no different from conventional crude.

No independent scientific research has been done to determine who is right. But a seven-month investigation of the Enbridge spill by InsideClimate News has revealed one fact neither side disputes: The cleanup of the Kalamazoo River dilbit spill was unlike any cleanup the EPA had ever tackled before.

Instead of remaining on top of the water, as most conventional crude oil does, the bitumen gradually sank to the river's bottom, where normal cleanup techniques and equipment were of little use. Meanwhile, the benzene and other chemicals that had been added to liquefy the bitumen evaporated into the air.

InsideClimate News also learned that federal and local officials didn't discover until more than a week after the spill that 6B was carrying dilbit, not conventional oil. Federal regulations do not require pipeline operators to disclose that information. And Enbridge officials did not volunteer it.

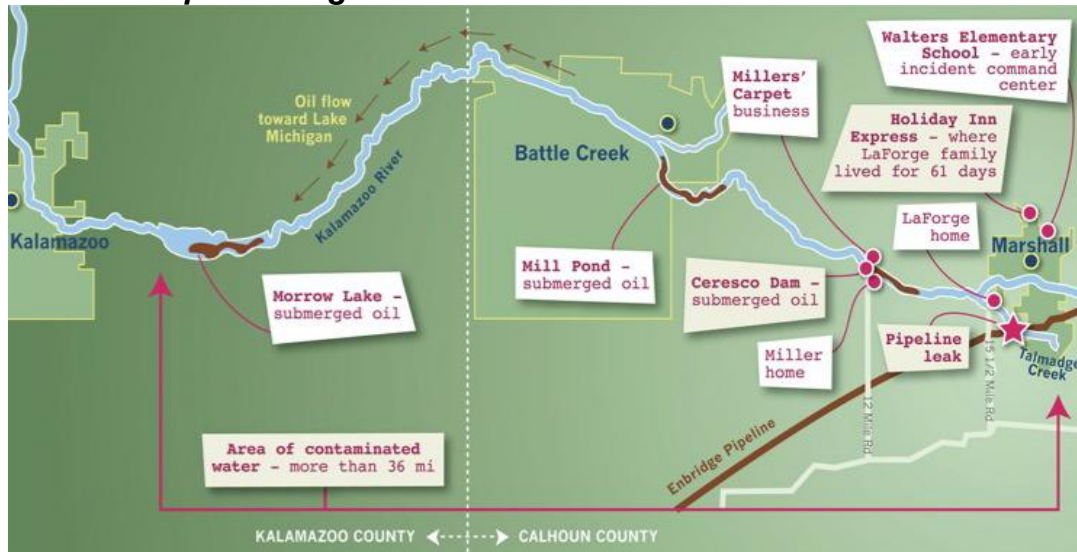
Mark Durno, an EPA deputy incident commander who is still involved in the cleanup in Marshall, is among those who were surprised by what they found.

"Submerged oil is what makes this thing more unique than even the Gulf of Mexico situation," Durno told InsideClimate News. "Yes, that was huge—but they knew the beast they were dealing with. This experience was brand new for us. It would have been brand new for anyone in the United States."

Jim Rutherford, the public health officer for Michigan's Calhoun County, said he had "no idea what I was driving into," when he rushed to Marshall the day 6B ruptured.

"Enbridge was caught off guard initially, much like all of us were," Rutherford said in an interview. "We just weren't ready for anything of this magnitude. ... We didn't even know the nature of the type of crude."

Click on map to enlarge



On Sunday, July 25, 2010 at 5:58 p.m. local time, Enbridge Line 6B ruptured near Marshall, Michigan and released more than one million gallons of Canadian diluted bitumen into Talmadge Creek and the Kalamazoo River. Illustration by Catherine Mann for InsideClimate News. [8]

Pipeline 6B was built in 1969 and is 293 miles long. It is part of Enbridge's 1,900-mile Lakehead system, which transports Canadian oil to major refining centers in the Great Lakes region, the Midwest and Ontario.

In 1999 Enbridge was among the first pipeline operators to bring Canadian dilbit into the United States. Every day, more than 11.3 million gallons of Canadian oil is transferred to 6B at Enbridge's terminal in Griffith, Ind., and pumped across southern Michigan, to Sarnia, in the province of Ontario, Canada. From Sarnia, it is transferred to lines that connect to refineries near Detroit and surrounding markets. On the day of the spill, 6B was moving a mixture of two types of dilbit—about one-quarter Western Canadian Select and three-quarters Cold Lake.



A map of pipeline 6B, in blue [9]

The federal agency responsible for regulating interstate pipelines is the Pipeline and Hazardous Materials Safety Administration [10] (PHMSA), a perennially underfunded and understaffed division [11] of the U.S. Department of Transportation. For the most part the agency relies on pipeline operators to monitor their pipelines and self-report any problems. One of the biggest concerns is corrosion, which can lead to spills or leaks if the corroded areas aren't patched or replaced.

When corrosion rises above a certain threshold, PHMSA requires that it be repaired within 180 days. But the rules are flexible, and companies can easily negotiate for more time.

Records show that 6B had a history of corrosion problems.

In 2008, Enbridge identified [12] 140 corrosion defects on 6B as serious enough to fall into the 180-day category. But the company repaired just 26 of them during that period.

In 2009, Enbridge self-reported a separate set of 250 defects [13] to PHMSA. The company fixed only 35 of them within 180 days.

Instead of immediately addressing the 329 defects that now remained, Enbridge got a one-year extension [14] from PHMSA by exercising its legal option to reduce pumping pressure on 6B while it decided whether to repair or replace the line.

A defect on 6B near John LaForge's house, where the pipeline eventually ruptured, didn't appear on any of the 180-day repair lists.

That defect, at mile marker 608, was detected at least three times [15] before the pipeline ruptured, in 2005, 2007 and 2009, according to documents Enbridge filed with PHMSA

over the years. But each time, Enbridge decided it wasn't significant enough to require repairs within 180 days.

Ten days before 6B ruptured, Enbridge applied to PHMSA [16] for another extension. It asked for an additional two and a half years to decide whether 6B should be repaired or replaced.

On the same day Enbridge applied for that extension, Richard Adams, the company's vice president of U.S. operations, assured a congressional subcommittee on pipeline safety that Enbridge was well prepared for an emergency.

"Our response time from our control center can be almost instantaneous, and our large leaks are typically detected by our control center personnel," Adams told the lawmakers. "They can view that there is a change in the operating system, and there are provisions that, if there is uncertainty, they have to shut down within a period of time, and that would include the closing of automatic valves."

The emergency response plan the company keeps on file with PHMSA is more specific. It says [17] a rupture on the Lakehead system would be detected within five minutes and the damaged segment closed in three minutes.

The real-world test of Enbridge's emergency plan began at 5:57 p.m. Eastern Daylight Time on July 25, 2010, about the time the LaForge family was eating Sunday dinner. In a control room 1,500 miles away in Edmonton, Alberta, Enbridge was stopping the pumps on 6B as part of a scheduled, 10-hour shutdown. The company was waiting for more oil to fill storage tanks at the start of 6B in Griffith, Ind., so a full shipment could accumulate before pumping resumed.

One minute later, a high-priority alarm [18] sounded in the control room, indicating that pressure had dropped to zero near Marshall. Another alarm triggered Enbridge's safety system and automatically halted the pumps at Marshall. Over the next five minutes, three more high-priority alarms signaled pressure problems on the line. Then a sixth alarm sounded, signaling a discrepancy between the volume of oil entering and exiting the pipeline.

At first, the control room operators weren't particularly concerned, according to a control room timeline [19] and other documents recently released by the National Transportation Safety Board, or NTSB. They thought a large bubble had formed between batches of crude, a problem that often resolves itself. They figured the bubble would last until they restarted the pipeline early Monday morning.

The operators were so confident of their diagnosis that when their 12-hour shift ended at 8 p.m. they didn't mention the six alarms to their replacements, according to [20] the NTSB documents.

Back in Calhoun County, however, noxious odors were beginning to permeate the summer night. At 9:25 p.m. local residents started dialing 911 [21]. One complained about a "very, very, very strong odor, either natural gas or maybe crude oil." Another described a house "asphyxiated with the gas smell" and asked if it was safe. Firefighters and local utilities checked the area for gas leaks, but found nothing. A Michigan Gas technician reported that he smelled petroleum.

The 911 calls continued as Sunday slipped into Monday.

At 4 a.m., controllers in Edmonton restarted the pipeline as scheduled and pumped oil up the line with the force of a firehose. Over the next hour, six more alarms went off.

At approximately 5 a.m., they shut 6B down again.

A pipeline analyst in the control room said 6B should be started again with more pressure, so oil would fill the line and overcome the bubble they thought was triggering the alarms.

"I guess there's two choices here, either consider it a leak or try it again?" the control center operations supervisor said.

"Just call it a false alarm," the analyst said [22].

As they prepared to restart the line for a second time, one of 6B's operators said he thought there was a leak. But others disagreed, and at 7:10 a.m., 6B's pumps kicked into gear again.

Four more high-priority alarms sounded as pumping continued for at least 45 minutes.

At 7:48 Monday morning—about the time Lorraine LaForge was telephoning John to tell him the smell near their house was even worse—the shift leader called for almost doubling pressure on 6B. But the extra power wasn't available, so they shut down the line again.

Two of the control room operators agreed they had never experienced a situation quite like this.

"Whatever, we're going home and will be off for a few days," one of them said [23]. They left the control room a few minutes later.

The next shift took over, aiming to restart 6B as soon as extra power was available so they could clear what they still thought was a bubble from the line. At 9:49 a.m., they

heard some reassuring news from Marshall: The Enbridge electrician who inspected the pump station and general vicinity hadn't detected any leaks or unusual odors [24].

The leak wasn't discovered until 11:17 a.m., when an employee for a Michigan utility company called Enbridge's emergency number with the bad news. Oil was pouring into Talmadge Creek, about three-quarters of a mile from the pump station, he said [25].

At 11:45 a.m., an Enbridge employee arrived at the site and confirmed the leak [26].

InsideClimate News asked Enbridge to answer a question that the NTSB timeline raises: If the company didn't know about the leak until 11:17 a.m., why had its workers gone to the LaForge residence at 10 a.m. and tested the air in the family's home?

A company spokesman said he couldn't answer that question, or any other question about the chronology of events, while the NTSB's investigation is ongoing.

Pipeline operators are required to report spills to the National Response Center in Washington, D.C. "at the earliest practical moment" following "discovery of a release." This notification is considered crucial to any cleanup response because the NRC alerts state and federal agencies to unfolding disasters.

Enbridge first tried to contact the NRC just after 1 p.m. [27], according to the NTSB documents. The company had already alerted [28] its own public affairs office in Houston about the spill 15 minutes earlier.

Because the NRC line was busy, Enbridge didn't get through until 1:33 p.m.—almost two hours after it had confirmed the spill and more than three hours after Enbridge workers urged the LaForges to leave their home. The company reported a spill of 819,000 gallons of oil.

Three minutes after Enbridge finished talking with the NRC, the center had contacted 16 agencies [29].

By this time, the same oily muck that had darkened the LaForges carefully tended lawn was sloshing over the banks of Talmadge Creek and coating tree trunks, flowers and soil along the Kalamazoo River. Jay Wesley, a fisheries specialist with the Michigan Department of Natural Resources, was already on the scene, trudging along the floodplain and collecting oil-coated muskrats and turtles in cardboard boxes and plastic bins.

Everything reeked of petroleum. Residents were on edge.

Deb Miller was driving home from her event-planning job in Battle Creek that evening when she saw several hundred people clustered on 12 Mile Road bridge. The bridge

across the Kalamazoo River is in the village of Ceresco, about five river miles west of John LaForge's home. It offers a dead-on view of the Ceresco Dam, a local landmark.

Miller and her husband, Ken, had raised their two daughters in Ken's childhood home, which sits just 300 feet below the dam. They had built a deck off the back of their nearby flooring and carpeting business so they could enjoy watching fish swimming just under the river's surface.

The crowd parted so Miller could inch her car across the bridge and turn into her driveway. An overpowering odor of boiling hot asphalt assaulted her nostrils before she even opened the car door.

Miller joined the spectators on the bridge. Together, they watched an alarming brown mist rise as river water the shade of a dark chocolate malt tumbled 13 feet over the dam.

"We knew instantly by the smell and the color of the river that something had happened," Miller said, wrinkling her nose at the memory. "And whatever it was, it was huge."

Enbridge rushed workers to the creek as soon as the spill was confirmed. But even as they positioned absorbent boom on the water's surface and dug culverts to divert the oil, they suspected they wouldn't be able to stop it from surging into the river just a couple of miles away. Flooding from four days of heavy rain made the oil-soaked water almost impossible to contain.

The 175-mile Kalamazoo River is a treasured recreational area. After the federal Clean Water Act was passed in 1972, paper mills, wastewater treatment plants and other polluters had been forced to rein in their once-deadly discharges. Some stretches were so pristine that canoe paddlers could feel transported back to the 18th or 19th century. If rivers had personalities, Wesley, the fish expert, would have classified the pre-spill Kalamazoo as "natural and wild." In 2000, he and a team of scientists had documented it as home to 102 species of fish, 23 species of mussels and clams, 218 species of birds, 40 species of mammals and 40 types of amphibians and reptiles.

Keeping the oil out of this important resource was crucial. But the EPA, which was taking command of the cleanup, was also looking at the bigger picture.

The Kalamazoo is not a drinking water source. But about 115 river miles west of Marshall it empties into Lake Michigan. Together with the other four Great Lakes, Lake Michigan provides drinking water for at least 26 million Americans and close to 10 million Canadians. If the lake became contaminated, a local disaster would escalate into a regional catastrophe.

The EPA and Enbridge also worried about a stretch of the river near the city of Kalamazoo, about 43 river miles west of Marshall.

Polychlorinated biphenyls, better known as PCBs, were embedded in the river where a factory had dumped them years ago. The area had been declared a Superfund site, and nobody was sure what might happen if oil mixed with PCBs, which are known carcinogens.

The cleanup teams had two advantages as they planned their strategy. The break had occurred just minutes from Enbridge's maintenance facility in Marshall, so some cleanup equipment was immediately available. Marshall is also close to Interstates 94 and 69, so more apparatus could be trucked in quickly from Battle Creek, Kalamazoo, Lansing, Detroit and Chicago.

Dozens of federal, state and local officials converged at a makeshift command center in an Enbridge building near the center of town.

Durk Dunham, Calhoun County's emergency management services director, was confident this would be a quick in-and-out operation. He figured vacuum trucks would quickly remove the oil and everybody would be home for dinner that night.

But when Dunham surveyed the devastation from a helicopter later Monday—and saw pure black instead of a ribbon of river—he realized his initial assessment was wrong. His eyes teared up when he saw the extent of the devastation.

"It was heartbreaking," he said. "There wasn't much being said on that helicopter."

By the time Jim Rutherford, Calhoun County's public health officer, arrived that afternoon from his office in Battle Creek, the oil had overwhelmed the creek. Despite the best efforts of the cleanup crews, it was surging into the Kalamazoo River.

Rutherford, just two years into his job, was bewildered by what he saw. He and his staff were prepared to deal with tornadoes and other severe weather but they knew next to nothing about oil spills. Until that afternoon, Rutherford hadn't even known that an oil pipeline passed near Marshall.

"We were pressing Enbridge as to what their plans were," he said about those early chaotic hours at the command center. "They only had a middle manager there and he was like a deer in the headlights. Yes, EPA was there, but we really needed Enbridge to call the shots."

The officials had two questions to answer—fast.

Could a spark ignite a chemical explosion—a major concern at any oil spill? And did the vile-smelling air pose a health risk for nearby residents?

Answering the first question was relatively easy. Using monitors that measured the mixture of oxygen and hydrocarbons in the air, the EPA determined that the likelihood of an explosion was low to non-existent.

Finding a definitive answer to the second question was more daunting.

Every type of crude oil, including diluted bitumen, is made up of hundreds of chemicals, and many of them evaporate into the air after a spill. Scientists don't fully understand how some of these chemicals affect humans. During a congressional hearing on the spill, Scott Masten, a scientist at the National Institute of Environmental Health Sciences, would testify ^[30] that "the potential for human health effects exist. However, understanding and quantifying these effects requires further study. There has been relatively little long-term research into the human health effects from oil spills."

One chemical commonly found in crude oil—benzene—is of particular concern, because it can cause health effects at low concentrations and over short periods of time. Studies have shown that people regularly exposed to benzene for several years can develop leukemia and other cancers.

The Natural Resources Defense Council and other environmental organizations have long contended that dilbit contains more benzene than conventional oil, but it's hard to know whether that's true. Little research has been done on dilbit, and most of that work was conducted by the industry and is considered proprietary information.

Workers with the EPA and Enbridge joined Michigan health officials in using an assortment of hand-held monitors to check the air for benzene, a standard procedure at any big oil spill. Some types of monitors, which they usually had access to, weren't available that first day because they were still at the BP oil spill.

The readouts in Marshall fluctuated dramatically. The monitors detected benzene levels that ranged from below 50 parts per billion (ppb) to as high as 200 ppb. Some alarming spikes—6,250 ppb and even 10,000 ppb—showed up over patches of oil on the water and away from homes.

Rutherford huddled with federal and state health experts to try to figure out what these numbers meant. Should they evacuate the hundreds of people who lived near the river?

As Calhoun County's health director, Rutherford was responsible for making that decision. But he felt overwhelmed. Until now, his primary focus had been coordinating food inspections and school nurse programs for the county's 136,000 residents. His health department didn't have access to monitoring equipment. In fact, only one of his 70 employees is dedicated to emergency preparedness.

"People need to understand that at a local level, we're totally dependent on state and federal resources in a situation like this," he said recently. "That's a reality."

For help, Rutherford turned to the federal and state health experts, people he would later describe as his "superheroes." But they couldn't provide any easy answers because no federal benzene guidelines applied specifically to their particular crisis.

The federal Agency for Toxic Substances and Disease Registry calculates ^[31] that an average person can be exposed to 6 parts per billion of benzene—the rough equivalent of two tablespoons of liquid in an Olympic-size swimming pool—for up to a year without long-term health effects. The agency uses 9 ppb as the benchmark for up to two weeks exposure.

Another set ^[32] of benzene guidelines, drawn up by a coalition of federal agencies, is usually used for workers dealing with a short-term emergency. Those guidelines say ^[33] that people can be exposed to up to 200,000 ppb for eight hours without increasing the risk of long-term health effects.

The health experts who gathered in Marshall weren't exactly sure how long the benzene would linger, but their expertise told them it would be longer than eight hours but shorter than two weeks—and definitely less than a year. So what were they to do?

People were already calling Rutherford's office, local hospitals and the Poison Control Center to complain about headaches, sore throats, nausea and vomiting—all symptoms that the Centers for Disease Control and Prevention has linked to benzene exposure. But other, less dangerous chemicals found in oil can also cause those symptoms.

For more accurate data they needed air sampling equipment, which requires more time to produce results but is more sophisticated than hand-held monitors. Mark Durno, an EPA deputy incident commander for the spill, said that the EPA team, veterans of many oil spills, considered this an ordinary spill and saw no need to rush sampling equipment to Marshall on Monday.

Late Monday Enbridge gave the EPA a Material Safety Data Sheet, or MSDS, a federally mandated document required for hazardous substances that are transported or used in a workplace. But the three-page MSDS ^[34] didn't offer much guidance. Nowhere did it mention "bitumen" or "diluted bitumen" or "dilbit." The only clue that the oil in 6B might be different from conventional oil were references to "diluent" and "condensate," two terms that refer to the chemicals added to dilute the bitumen. But nobody seemed to recognize that the words indicated this was not ordinary crude.

Durno said the MSDS confirmed their assumption that 6B was carrying regular heavy crude oil. The EPA had supervised the cleanup of almost 8,400 spills since 1970, and the Enbridge supervisors at the scene did not hint that this spill might be different.

Rutherford and the other health care experts considered everything they had seen and learned that day. They agreed that an evacuation wasn't needed—at least not yet.

The monitoring was still continuing as Rutherford drove home in the wee hours of Tuesday morning. He pondered how long the oil would dirty the river of his childhood—and how far he would have to travel to outpace the hideous stink that soured the still summer air.

"It was kind of numbing, like being in a dream," he said. "Were we ever going to be able to get a handle on this?"

Researcher Lisa Schwartz and InsideClimate News intern Kathryn Doyle contributed to this report.

Correction: This story has been corrected to reflect that BP's Macondo well was capped on July 15, 2010, ten days before the Enbridge spill occurred.

See Also:

[Timeline: How the Dilbit Disaster Unfolded](#) ^[35]

[A Dilbit Primer: How It's Different from Conventional Oil](#) ^[36]

[Kalamazoo River Reopens, 23 Months after Spill, But Submerged Oil Remains](#) ^[37]

Links:

- [1] <http://insideclimatenews.org/sites/default/files/Catherinemannmapspill.png>
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- [4] <http://insideclimatenews.com/topic/keystone-xl>
- [5] <http://insideclimatenews.com/news/20120621/enbridge-oil-spill-tar-sands-dilbit-michigan-kalamazoo-river-pipeline-safety-epa-keystone-xl>
- [6] <http://www.documentcloud.org/documents/365744-enbridge-ferc-filing-5-18-12.html>
- [7] http://www.nts.gov/investigations/2010/marshall_mi.html
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- [14] <http://www.documentcloud.org/documents/351569-enbridge-cong-test.html#document/p17/a61042>
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- [17] <http://www.documentcloud.org/documents/372383-part-3-enbridge-response-plans-chicago-superior.html#document/p5/a61085>
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- [21] <http://www.documentcloud.org/documents/359008-83-transcript-911-calls.html>
- [22] <http://www.documentcloud.org/documents/359033-179-control-room-report.html#document/p12/a60958>
- [23] <http://www.documentcloud.org/documents/359033-179-control-room-report.html#document/p15/a60959>
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- [25] <http://www.documentcloud.org/documents/359033-179-control-room-report.html#document/p17/a60963>
- [26] <http://www.documentcloud.org/documents/360434-025-emergency-environmental-response-group.html#document/p7/a61052>
- [27] <http://www.documentcloud.org/documents/360434-025-emergency-environmental-response-group.html#document/p24/a61055>
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The Dilbit Disaster: Inside The Biggest Oil Spill You've Never Heard Of, Part 2

By Elizabeth McGowan and Lisa Song, InsideClimate News

Jun 27, 2012

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Inside the Dilbit Disaster, Part 2

Days of confusion followed the spill. Officials thought they were cleaning up ordinary crude. It was an erroneous assumption Enbridge did not correct.

By Elizabeth McGowan and Lisa Song, InsideClimate News

This is part 2 of a three-part series. You can read it all on [an eBook now](#) [2]. Read [part 1 here](#) [3].

On Tuesday, July 27, 2010—the day after the biggest pipeline spill of Canadian dilbit in North America was detected—oil was still streaming from Talmadge Creek into the Kalamazoo River near Marshall, a community of 7,400 in southwestern Michigan. Some people had fled their riverside homes because of the overwhelming smell, like burning tar.

Six inches of rain between Thursday and Sunday had turned the normally sedate river into a roiling brown torrent that overflowed its banks by several feet. The creek, usually only five or six feet wide and a foot deep, was at least 100 feet wide.

The EPA officials who had gathered in Marshall still thought they were dealing with the light crude oil that usually flows through U.S. pipelines. As veterans of other spills, they were certain they were prepared for this one.

What they didn't know yet was that 6B, the pipeline that ruptured, was carrying bitumen from Canada's tar sands region. Bitumen is the heaviest oil in use today and is too thick to flow through pipelines. To remedy that problem it is thinned by about 30 percent with liquid chemicals, usually including benzene, which can cause cancer in humans.

This diluted bitumen, or dilbit, is the same type of oil that would be carried on the 1,702-mile Keystone XL pipeline if the controversial project is approved. When dilbit spills, most of the added chemicals evaporate, leaving the heavy bitumen to sink in water.

Pipeline 6B is owned by Enbridge Inc., Canada's largest transporter of crude oil. Enbridge's president and chief executive officer, Patrick Daniel, perpetuated the mistaken belief that this would be a routine cleanup. On Monday, Daniel had flown in from Enbridge's Calgary, Alberta, headquarters in the company jet. In an interview the next day, he said much of the oil could be sucked off the water's surface with vacuum trucks and that only a "minuscule" amount might sink below the surface.

"To tell you the truth, it's lighter than water so it sits on top of the water," he said [4].

Days of confusion followed the spill, with federal and state officials basing their cleanup decisions on the erroneous assumption that the oil was ordinary crude. It was an assumption that Enbridge did not correct. Federal regulations do not require pipeline operators to disclose the specific type of crude oil their lines carry. The nonprofit Pipeline Safety Trust and other organizations have urged the government to change that policy since Canadian dilbit was first pumped into the United States more than a decade ago.

Two deadlines the EPA set Tuesday reflected the agency's confidence in a quick turnaround. Enbridge was ordered to clean up the wetlands near the broken pipeline by Aug. 27. The creek, the river and all shorelines were expected to be oil-free by Sept. 27. Both of the orders mentioned only oil—not dilbit.

The agency's overarching objective was keeping the oil from reaching the spot where the Kalamazoo empties into Lake Michigan, about 115 river miles west of Marshall. Together with the other four Great Lakes, Lake Michigan is a drinking water source for at least 26 million Americans and almost 10 million Canadians.

The EPA was also concerned about a Superfund site near the city of Kalamazoo, about 43 river miles west of Marshall. Polychlorinated biphenyls, better known as PCBs, were embedded in the river, and nobody was sure what would happen if oil mixed with PCBs, which are known human carcinogens.

While the scientists worried about protecting Lake Michigan from the oil, health experts fretted about the oil's effect on people living along the Kalamazoo's banks.

Benzene readings picked up by hand-held monitors were still swinging wildly. Readings ranged from less than 50 parts per billion, a level that didn't worry the health experts, to 3,000 ppb. The highest readings were in areas where oil was being recovered.

Jim Rutherford, Calhoun County's public health director, huddled with state and federal health experts. They had no idea how long the benzene would linger. And they still hadn't found any clear guidelines on whether people should be evacuated in these circumstances.

Finally they decided to create their own benchmark for evacuation, based on their analysis of the available scientific information.

The Michigan Occupational Safety and Health Administration lists 500 ppb as the workplace benzene limit. Using that standard, plus the federal standards they had studied earlier—and taking into account differences between workers and a general population that included children, the sick and the elderly—they decided on Wednesday to set 200 ppb as the benchmark for evacuation [5].

Rutherford would order an evacuation Thursday if monitors continued to show benzene readings of 200 ppb or above, they agreed. As the county health director it was also up to him to make the final call and to decide if it should be a mandatory or voluntary evacuation.

That Wednesday night, before Rutherford headed home, the EPA reported that the size of the spill was at least 1 million gallons. That figure exceeded Enbridge's Monday estimate of 819,000 gallons.

Even after three days of working double shifts, sleep didn't come easily for Rutherford that night.

At home, he walked for miles under the stars, sorting out his burdens. Being thrust into the limelight as a local health official was scary. He knew some people thought he wasn't acting quickly enough. But they weren't in the war room grappling with a multitude of unknowns. Was it practical, or reasonable, to displace elderly people and families with young children when hotel rooms were already at a premium because of the enormous influx of cleanup workers? Plus, he and the other health professionals didn't have any hard scientific evidence that temporary exposure to 200 ppb of benzene did, indeed, pose a danger.

All along, his priority had been to protect people's health, not compound the chaos the spill was already causing.

"You can't just evacuate an entire county," he said recently, recalling those days of indecision. "It's easier said than done."

Rutherford walked until long past midnight, rehearsing how he would deliver the news if benzene levels were still high on Thursday.

The next morning he saw the test results that had come in during the night and knew what he had to do.

Although benzene levels were generally dropping, hand-held monitors still showed levels of 200 ppb or higher at some locations. Most of the readings had dropped below the level of concern, but there also were single measurements of 200 ppb, 250 ppb, 500 ppb and 1,350 ppb.

The more sensitive sampling equipment had arrived, and the first results would be ready later that day. But Rutherford decided not to wait. It was time to call a press conference and start evacuating people.

Residents of 61 riverside homes north and northwest of the rupture site were asked to leave because of "higher than acceptable levels of benzene." It was a voluntary [6], not mandatory order, because Rutherford didn't want to have to force people from their houses.

Rutherford also announced that people living within 200 feet of the river between Talmadge Creek and the Kalamazoo County line shouldn't use their well water for cooking or drinking. Tests showed no evidence of groundwater contamination, but he didn't want to take any chances. Enbridge agreed to provide bottled water.

Workers from the county and state health departments fanned out along the river to deliver the evacuation notices in person. If nobody was home, a notice was stuck on the front door.

Twenty-seven households in the evacuation zone refused to leave. But more than 100 families outside the zone moved out—some of them driven out by the stench before the evacuation was announced.

The evacuation notice offered hotel options, told them how to arrange accommodations for their pets, and encouraged them to save their receipts, so Enbridge could reimburse them. Enbridge also offered to help the uninsured with medical bills, whether they evacuated or not.

Rhonda Stepp, an administrative assistant at Marshall High School, learned her house was in the evacuation zone when her retired husband called her at work. She hurried home so they could gather a few belongings before heading to her parents' house in Battle Creek.

"When they tell you to pack up what can't be replaced, you're just thinking, 'Oh my God, what do I take?'" Stepp said. "I took pictures off the wall and the contents of our safe."

On the day the evacuation began, Enbridge gave EPA officials and other responders at the command center a second Material Safety Data Sheet [7]. Like the first MSDS, it didn't mention dilbit. Again, Enbridge did not volunteer that information.

Mark Durno, the EPA deputy incident commander, said in a recent interview that if Enbridge had provided more specific information about the chemical makeup of the oil, the EPA would have rushed sampling equipment to the scene so sampling could have begun Monday.

Environmental organizations contend that dilbit contains more benzene than conventional oil. But it's difficult to determine if that's true. Most of the research conducted on dilbit has been done by the industry and is considered proprietary information.

The first air sampling data arrived from the lab that afternoon. It confirmed what the hand-held instruments had already indicated— although most of the benzene levels were below 50 ppb, some were as high as 550 ppb. Readings taken next to oil recovery sites ranged from 1,450 to 10,000 ppb.

The EPA was able to deliver one piece of positive news on Thursday. Although the oil had spread through more than two miles of Talmadge Creek and about 36 miles of the river, workers had managed to stop it before it reached the city of Kalamazoo. That meant that the PCBs buried in the river at the Superfund site wouldn't be disturbed— and that the drinking water so many people depended on from Lake Michigan was no longer at risk.

Susan Hedman, who directs EPA Region 5 in Chicago, was upbeat when she spoke with reporters on Sunday.

"I am happy to report significant improvement of the spill site, at the creek and the river," she said [8]. "Oil continues to be removed and we have not seen any further contamination."

Enbridge had dispatched 730 workers to Marshall by the end of the first week. That didn't include the hundreds of local, state and federal experts still flocking to the scene. More than 69,000 feet of containment boom arrived, along with 43 boats, 48 oil skimmers, 79 vacuum trucks, 19 tanker trucks and 77 mobile storage tanks.

Helicopters zoomed overhead. Airboats plied the river. The grind of internal combustion engines added to the cacophony as transfer trucks hauled goo sucked out of the river.

Deb and Ken Miller's tiny neighborhood in Ceresco had been transformed into a staging area complete with Dumpsters and a temporary dining area for workers. An ambulance and a fire truck were stationed near the bridge on 12 Mile Road, where buses and vans unloaded swarms of workers tasked with collecting oil. Decked out in white biohazard suits, they looked like space explorers. Sheriff's deputies set up a barricade at the bridge, and residents traveling that route risked arrest if they didn't stop.

Enbridge moved the command post to Walters Elementary School. Workers propped up their laptop computers on cardboard boxes and wedged themselves into chairs designed for grade-schoolers.

Daniel, the Enbridge CEO, apologized repeatedly for the damage his company had done in Calhoun County, where the rancid odors of oil were still powerful. At meetings, one-on-one talks and media interviews, he reassured residents that the company was committed "to cleaning up anything and everything" the oil had touched.

"We are responsible for the cleanup and we will be here until you are happy in this community... that we have completed our responsibilities," Daniel said [9].

Daniel promised John LaForge and several others who lived near the rupture point that Enbridge would "make them whole," by buying or building them new homes away from the river.

The Millers declined Enbridge's offer to move to a hotel. The closest hotels were already booked and they needed to watch over their store, their elderly dog and a homebound neighbor. To keep the stink at bay, they shut their windows and blasted the air conditioning.

Every time Deb Miller looked out her window, she fumed about the pain a broken oil pipe had inflicted on her community. She wondered why so few local authorities had known of 6B's existence and worried about the impact the oil was having on neighbors up and down the river. She was still taking oral chemotherapy as part of her treatment for breast cancer in 2002 and she wondered if chemicals in the oil would compromise her health.

On Monday, Aug. 2, Miller and hundreds of other residents filed into the Marshall High School gymnasium for a public meeting organized by the EPA. Enbridge provided carpeting, so the folding chairs wouldn't scratch the gym floor. But company officials weren't invited to attend, because the EPA wanted to make sure, as it does after every such disaster, that the public understood that state and federal oversight agencies were in charge of the cleanup, not the company that had caused the problem.

Hedman, the EPA Region 5 director who opened the meeting, was still upbeat.

"We will continue working until your river looks like this again," she said, showing a PowerPoint image of the pre-spill Kalamazoo.

Most of the audience applauded enthusiastically. But Deb Miller wasn't in any mood to clap. To her, it seemed people were responding to wishful thinking rather than reality. She was dismayed that they weren't allowed to take the microphone and vent their concerns. Instead, they were directed to the cafeteria, where booths had been set up so they could speak privately with various officials.

In her one-on-one meeting, Miller told an EPA employee about a mass of oil that had accumulated in a river alcove near her carpet store. The official listened attentively and promised to send workers to investigate.

Still, Miller headed home that night feeling she had wasted her time. She wanted someone to spell out what kind of financial compensation would be available to those directly affected by the spill and she wanted to know when the oil would be cleaned up.

She also wanted assurances that the foul air wasn't jeopardizing people's health.

"We were given a spiel, then herded into areas to ask questions," Miller said. "We're not scientists. How do we know what to ask? That's what made so many of us resentful, like you cannot trust that our federal government is going to tell you everything. We don't know exactly what kind of oil is in the river and you have a gut feeling that they haven't been forthright."

The day after the meeting, Enbridge rolled out a program to buy properties along the polluted section of the river and creek. More than 310 properties, about half of them homes, were eventually eligible. Owners were given a year to accept or reject the offer.

By then, the terrible smell was abating. Experts at the National Oceanic and Atmospheric Administration later said ^[10] most of the chemicals that had been added to dilute the bitumen probably evaporated by Aug. 4.

While Enbridge was reaching out to the community, it was also rushing to get 6B back on line. At least three U.S. refineries had been forced to reduce production, because they needed 6B's oil.

The company was losing money, too. Though Enbridge spokespeople didn't want to discuss it, the company's annual report ^[11] states that earnings were down \$85 million in the second half of 2010 for costs associated with the 6B spill.

Extricating the ruptured pipeline from the oil-saturated wetlands near John LaForge's home took more than a week. The two 20-foot pieces were trucked to the National Transportation Safety Board facility in Ashburn, Va., so they could be studied as part of the spill investigation. Enbridge pulled new pipe from its stock in Marshall and welded it into place.

On Aug. 9, two weeks after the spill occurred, Enbridge asked the Pipeline and Hazardous Materials Safety Administration (PHMSA) for permission to restart 6B.

PHMSA rejected the request ^[12] less than 24 hours later.

The plan lacked "sufficient technical details ... to permit a conclusion that no immediate threats are present elsewhere on the line that require repair prior to any re-start of the pipeline," PHMSA said in its letter to Enbridge. The agency wouldn't approve ^[13] any restart plan that "did not include excavating and exposing additional pipe and repairing or replacing additional pipe as necessary."

Among the flaws PHMSA listed was Enbridge's failure to "determine, investigate and remediate as necessary, at least four additional anomalies in Line 6B" that were similar to conditions near the spot where the Marshall leak occurred. Line 6B had several hundred corrosion defects and Enbridge had exercised its legal option to reduce pressure while it decided whether to repair or replace the line.

On Aug. 10, the Millers temporarily closed their carpet and flooring business. With the road in front of their store blocked off because of the cleanup, customers couldn't reach them.

By then, volunteers and workers were removing oil ^[14] from 83 turtles, 66 Canada geese, 12 ducks, three swans and four muskrats at a vacant warehouse Enbridge had turned into a rescue center. They had already cleaned and released 22 turtles and a frog.

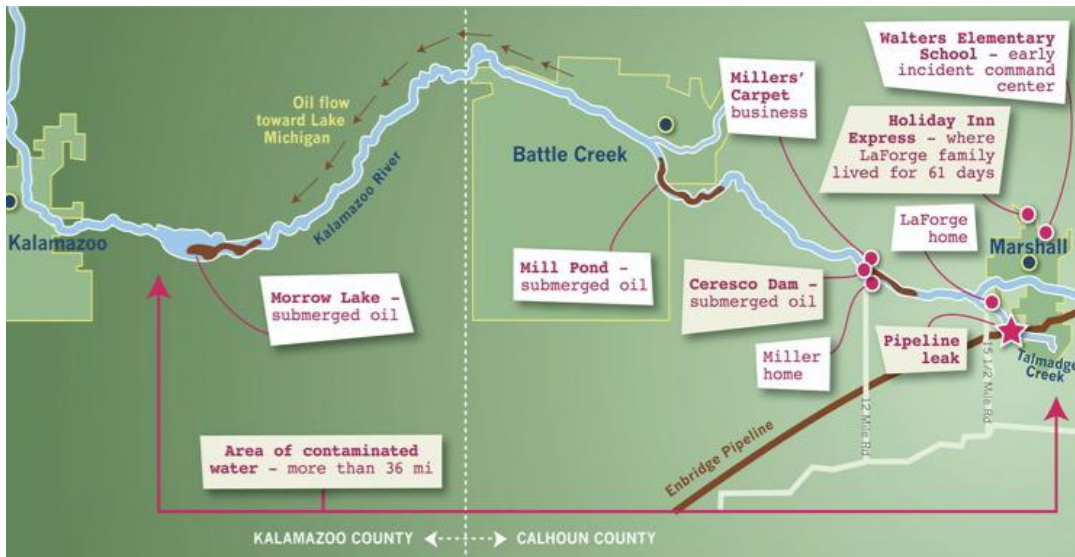
More than 99,000 feet ^[15] of boom was now positioned in 37 spots between the creek and Morrow Lake. Another 250,000 feet of boom was ready—just in case.

On Aug. 17, Rutherford, the county health officer, lifted the July 29 voluntary evacuation order because benzene readings were consistently below 6 parts per billion. He advised riverside residents to continue using bottled water for cooking and drinking.

At about the same time, cleanup crews began to notice something they hadn't seen at spills involving light crude oil.

The surface of the river was clearing in some places, a sign of progress. But when an EPA employee disturbed a clear patch of water near Morrow Lake—the dammed lake west of Marshall where they had finally stopped the oil—he noticed that tiny flakes of tar floated to the surface and formed a small oil sheen.

Click on map to enlarge



Map of the

rupture site and Kalamazoo River. Illustration by Catherine Mann for InsideClimate News. [16]

Closer to Battle Creek, crews with the Michigan Department of Natural Resources also noticed an odd phenomenon. When they disturbed the sediment at the river's bottom with their hip waders, globules of tarry oil popped up and created similar but larger sheens.

To determine whether these were isolated incidents or signs of a deeper problem, workers lowered absorbent material wrapped in chicken wire into the river to see what it captured. They also shook up the sediment with hand-held poles to see what floated to the top.

They were shocked by what they learned. Tar balls the size of marbles were being swept along the river's bottom with the clay, sand and other organic material that is normally caught up in river currents. Basically, the tar balls were bouncing downstream, stopping only when a deep pool, an eddy or a man-made barrier like a dam halted the ride. At low points in the riverbed, they were settling into as much as six inches of sediment.

Mark Durno, who has 20 years of experience with the EPA, had never seen anything like it.

"We had no idea sinking oil would be such a problem," Durno said. "Not only was this material submerged but it was mobile and moving along the river bottom."

At first, the scientists thought they could mount sonar or other high-tech instruments on boats or helicopters and map exactly where the oil had sunk. But the depth of the river, the type of sediment and the nature of the oil made that impossible.

Instead, teams of specialists had to resort to the laborious process of manually recording every square inch of the oiled river. Wielding hand-held poles, they poked the sediment to gauge how much oil they found. Each point was assigned a GPS (global positioning system) reading and added to a GIS (geographic information system) database. Using this digital map they could estimate the oil's footprint and volume. Over time, they could see where it moved and measure the effectiveness of their cleanup techniques.

This unusual twist in the cleanup operation was discussed at daily meetings attended by Enbridge and the government agencies supervising the cleanup. But Durno, who attended all the meetings, said Enbridge never volunteered the information that the oil was not light crude but Canadian dilbit.

What was happening at the spill site is now clear. After 6B ruptured, the liquid chemicals that had been added to dilute the bitumen began evaporating, and the heavy bitumen began sinking. When the surface of the river started clearing, it wasn't necessarily because the oil was gone, but because it had disappeared from sight.

The Natural Resources Defense Council, a powerful advocacy organization that opposes the Canadian tar sands industry as well as the Keystone XL pipeline, already suspected that 6B was carrying bitumen from Western Canada's tar sands fields.

Kari Lyderson, a former Washington Post reporter who was writing for the NRDC's quarterly magazine, spoke with Enbridge's Daniel ^[17] several times in August and asked ^[18] if the oil in 6B was tar sands oil, or bitumen. She said he told her ^[19] several times that it was not.

In a teleconference call ^[20] with Lyderson and other reporters, Daniel implied that the oil in 6B wasn't tar sands oil because it had been extracted by steam distillation rather than mining. On that same call, however, he acknowledged that the oil was so thick that it had to be thinned by a third with light crude before it could be pumped through pipelines.

The NRDC attacked Daniel ^[19] for "trying to be cute with his language."

A few days later, the CEO backpedaled on the tar sands issue. "What I indicated is that it was not what we have traditionally referred to as tar sands oil," he told the Michigan Messenger ^[21]. "If it is part of the same geological formation, then I bow to that expert opinion. I'm not saying, 'No, it's not oil sands crude. It's just not traditionally defined as that and viewed as that.'"

As far as the EPA was concerned, the semantics of the debate didn't matter much. What did matter was the challenge the agency now faced. Bitumen lay at the bottom of a major U.S. river, a river that also happened to be at flood stage because of recent rains. The oil had to be removed. But how could they complete that cleanup mission without destroying the waterway they were trying to save?

Less than a month after the dilbit spill in Marshall, Enbridge's image took another knock. On Aug. 17 the Pipeline and Hazardous Materials Safety Administration fined the company \$2.4 million for violating safety regulations on a pipeline in Clearbrook, Minn., which like 6B is part of the company's Lakehead system. It involved a November 2007 incident in which two company employees were killed after repairs caused leaking crude oil to ignite. PHMSA said [22] "Enbridge failed to safely and adequately perform maintenance and repair activities, clear the designated work area from possible sources of ignition, and hire properly trained and qualified workers."

The company received even more public scrutiny when the initial Aug. 27 deadline for cleaning up the Marshall spill came and went, unmet. By then, however, the EPA was beginning to understand why Enbridge was so far behind.

"It's safe to say we had a set of circumstances that combined to give us some challenges," said Ralph Dollhopf, who was leading the agency's efforts in Marshall. "At the onset of something like this, you rarely have details on the scope of work required. As Enbridge progressed, we learned how much oil was out there."

Researcher Lisa Schwartz and InsideClimate News intern Kathryn Doyle contributed to this report.

See Also:

The Dilbit Disaster: Inside The Biggest Oil Spill You've Never Heard Of, Part 1 [23]

Timeline: How the Dilbit Disaster Unfolded [24]

A Dilbit Primer: How It's Different from Conventional Oil [25]

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The Dilbit Disaster: Inside The Biggest Oil Spill You've Never Heard Of, Part 3

By Elizabeth McGowan and Lisa Song, InsideClimate News

Jun 28, 2012

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Inside the Dilbit Disaster, Part 3

'Hearing the oil being described as a totally different product knocked my feet out from under me,' Miller recalls. 'What else have they lied to us about?'

By Elizabeth McGowan and Lisa Song, InsideClimate News

This is part 3 of a three-part series. You can read it all on [an eBook](#), ^[2] or read [part 1 here](#) ^[3] and [part 2 here](#) ^[4].

As the fall of 2010 approached, John LaForge could still smell tar when he drove by his old house with the windows of his truck rolled down.

LaForge had lost hope that he and Lorraine would someday return to the house on Talmadge Creek where they had raised four children. Tire tracks from heavy equipment had scarred and muddied the lawn LaForge once tended so carefully.

The cleanup of North America's biggest dilbit pipeline spill was behind schedule and LaForge's property in southwestern Michigan, about a quarter mile from where an Enbridge pipeline had split open on July 25, was ground zero. More than 2,050 workers had flocked to Marshall, a community of 7,400. Parking was such a hassle at Kate's Diner, where he ate breakfast before work, that he worried regulars would stop patronizing the restaurant.

LaForge began negotiating with Enbridge for the company to buy his property. In September, he and Lorraine, along with their daughter and her three young children, left the two hotel rooms they'd shared for 61 days and rented a house while they looked for a place to buy. Enbridge footed the \$12,000 hotel bill and agreed to pay their rent. All

the moving was taking a toll on Lorraine. She was still recovering from the emergency gallbladder surgery she'd undergone while they were living in the hotel.

The LaForges salvaged photographs, dishes and hardwood furniture from their home of 28 years. But the oil stink had permeated their mattresses, clothing, books, toys, rugs and upholstered furniture. They left it all behind. "How do you replace your granddaughter's little dress from her first day in kindergarten?" LaForge said, looking back on that difficult transition. "You put your sweat and heart into a place and then somebody comes along and destroys it. It's painful."

The spill was adding stress to Deb Miller's life, too.

She and her husband, Ken, finally re-opened their carpet and flooring store in October, two months after the spill forced them to shut it down. They had no intention of selling their house or business, even though both buildings were located near Ceresco Dam, another focal point of the cleanup. Enbridge offered to pay their rent if they temporarily relocated their business, but the offer didn't cover the cost of moving their inventory. The Millers said no. Instead, they accepted an "inconvenience" payment for lost income.

Watching the cleanup drag on was turning Miller into an activist. Her bout with breast cancer had sensitized her to health issues, and she feared that the toxicity of the oil might have jeopardized residents and emergency responders in ways that scientists didn't understand. She filled a three-ring binder with 8-by-10 color photographs documenting the mess at the dam and carried it to meetings and strategy sessions with neighbors.

"First responders are our neighbors, our dads and our brothers," she said. "What training were they provided? Our local agencies were tasked with responsibilities they were in no way equipped to handle."

In mid-September, Miller took her photos to Washington, D.C., where she and five other Calhoun County residents testified before the House Transportation and Infrastructure Committee. The chairman, Jim Oberstar, was a Democrat from Minnesota, where another section of Enbridge's Lakehead pipeline system is located. Two representatives from Michigan served on the committee: Mark Schauer, a Democrat who represented the Marshall area, and Candice A. Miller, a Republican from the eastern part of the state. (Candice Miller is not related to Deb Miller.)

It was Deb Miller's first trip to the nation's capital. She was nervous, but determined to be heard. She labored almost three weeks on her 19 pages of testimony. Congressional staffers had told Miller and her neighbors to "write from the heart."

"I knew I had to do what I had to do," she said recently. "My message was that I'm not going away. We told our stories because somebody had to put a face on what the impact of this spill was."

The Sept. 15 hearing in the Rayburn House Office Building lasted seven hours. EPA Administrator Lisa Jackson was among the witnesses. So were National Transportation Safety Board Chairman Deborah Hersman and Enbridge CEO Patrick Daniel.

Miller sipped water to control the nagging cough she'd had since the spill.

"I was an innocent bystander," she said [5] when it was her turn to sit behind a microphone and address the committee. "I did not choose to breathe that foul air. I did not choose to lose a summer to ... vacuum trucks, fan boats, and helicopters and strangers on my riverbank, not to be able to utilize our pool in our back yard for lack of privacy. I did not choose to close my business, and I certainly did not choose to watch the geese struggle while covered in oil. Enbridge made that decision for me.

"I sincerely hope this spill will ensure that you (Enbridge) will be more responsible with the maintenance of all of your pipelines, even if it means replacing them all," she added. "I pray they will remain closed until that can be determined how safely to restart them."

Another Calhoun County resident, Michelle BarlondSmith, told the committee that when she and other residents of a Battle Creek trailer park sought health care for spill-related symptoms, an Enbridge representative told them they had to sign a waiver form [6]. They later learned that the form gave the company access to their entire medical histories.

The trailer where BarlondSmith lived with her husband, Tracy, was just 200 to 300 feet from the oiled river, she told InsideClimate News. They spent several weeks at a hotel to escape the stench, which she said made her feel dizzy and sick to her stomach.

In a transcript of the testimony, Schauer, the representative from Battle Creek, asked BarlondSmith [7] if she was comfortable with the company having access to her medical records.

Ms. BARLONDSMITH: To be very frank with you, one of the side effects that you have with this is you do not think clearly... I read over it twice very quickly. I gave it to my husband. He glanced at it because he was going to go to the doctor also.

Mr. SCHAUER: He is not an attorney, I take it, or a health care provider?

Ms. BARLONDSMITH: Unfortunately, he is not an attorney and I wish he was. But I signed it because I was told if you wanted to see the doctor, you must sign this.

Schauer grilled Daniel [8], the Enbridge CEO, about the medical release form. Schauer and Oberstar had sent a letter [9] to Daniel on Sept. 1, demanding that Enbridge stop asking uninsured residents to sign the waiver.

Mr. SCHAUER: So have you stopped the use of this form?

Mr. DANIEL: I don't know that offhand. I can get back to you and confirm that.

Mr. SCHAUER: Well, and I also request—and I think I requested this in writing—that you rescind all of those that have been signed. Would you agree to do that?

Mr. DANIEL: Yes.

Mr. SCHAUER: Thank you.

Rep. Candice Miller pressed Daniel ^[10] about a defect on a section of 6B in her district where the pipeline is buried under the St. Clair River, a vital drinking water source for northern Michigan.

The dent had been identified in August 2009 and was serious enough to meet PHMSA's criteria for repair within 60 days. But 11 months later, it still wasn't repaired. And Miller wanted to know why.

In his testimony, Daniel explained ^[11] that because "the site is very difficult to access," Enbridge decided to lower the operating pressure while conducting "a comprehensive engineering assessment."

"The likelihood that that dent will cause a leak is very remote," he assured the committee. "It is smooth, without evidence of corrosion or cracking. The pipe at that point is twice as thick as normal and is protected by concrete and engineered gravel. Nonetheless, Enbridge is committed to replacing or repairing that segment of pipe, and we will submit our proposed plan to the regulator by the end of this month."

Daniel also reiterated the promise he had made so often since he arrived in Michigan the day the spill was detected.

"I am personally committed and our company is committed to doing everything that we can to make up to the people in Marshall and Battle Creek for the mess that we made," Daniel said ^[12]. "We are working very diligently to meet the September 27th deadline for cleanup of the spill, in conjunction with the EPA and all of the coordinating agencies... You have my commitment that we will be there to make your constituents happy that we have done the right job."

When Deb Miller's plane landed in Michigan that night, she was almost giddy after watching how committee members held Enbridge accountable.

"I'm not naïve enough to think that everything would be resolved that day," she said. "But I walked out of there with a ray of hope that maybe somebody was listening."

But Miller was scared, too. She'd always assumed that the oil that was polluting the river in her back yard was ordinary crude. But in casual conversations away from the microphone that day, people had called it "diluted bitumen," a term she'd never heard before.

"Hearing the oil being described as a totally different product knocked my feet out from under me," Miller recalled. "My first reaction was to cry. Then I wondered, 'What else have they lied to us about?' To this day, that is why I am so frustrated with EPA and Enbridge. Nobody knocked on my door and told me I was in danger."

Miller wasn't alone with her fears.

By early September, local residents had dialed the hotline Enbridge set up the day of the spill at least 9,400 times. The hotline, as well as the county health office, local hospitals and the Poison Control Center, had been flooded with questions about what harm the stinky air might be causing.

A survey ^[13] of four riverside communities that the Michigan Department of Community Health conducted within a month of the spill found that almost 60 percent of the 550 people interviewed experienced headaches, breathing difficulties, coughs, vomiting, anxiety or other health problems.

The federal Pipeline and Hazardous Materials Safety Administration allowed Enbridge to reopen pipeline 6B on Sept. 27, two months after the massive spill. The agency limited it to pumping 10.2 million gallons per day instead of 11.3 million gallons per day. But Enbridge was back in business.

The cleanup wasn't proceeding as rapidly.

Enbridge missed its Sept. 27 EPA deadline—the one that required it to rid the creek, river and shorelines of all oil. A new deadline was set for Oct. 31.

Close to 30 miles of boom was now positioned along the river. But more oil kept turning up. It saturated soil and plants along the floodplain. It contaminated small islands along the river. It was embedded in up to six inches of underwater sediments.

"I truly believe the characteristics of this material is the reason we still have such a heavy operation out here," Mark Durno, the EPA deputy incident commander, told Michigan Public Radio. "Because it was a very heavy crude, we ended up with a lot more submerged oil than we anticipated having to deal with...If you'd shovel down into the islands you'd see oil pool into the holes we'd dig."

Durno had become a fixture at Pastrami Joe's, a popular deli. Twelve- and 16-hour workdays meant he stayed in touch with his wife and two young children back in Ohio with text messages and brief phone calls. Every day, his wife e-mailed him photos of the home remodeling project they had begun about the time of the spill. The way the cleanup was proceeding, he figured he wouldn't be leaving Marshall any time soon.

Federal regulations require culpable parties—in this case Enbridge —to restore waterways to their pre-spill state. But how was the company going to remove every bit of submerged oil from 36 miles of the river when it hadn't even been able to thoroughly clean more than two miles of Talmadge Creek?

Tracking and removing the transient blobs of bitumen that had sunk to the bottom of the river was especially frustrating.

In October, the EPA directed Enbridge to experiment with dredging a three-acre area above the Ceresco Dam, which was inundated with oil. Crews operating excavators dug for about three weeks and carted away 5,500 cubic yards of oil-soaked sediment, enough to fill 27 semi-trailers. They also removed, decontaminated and then returned 14 million gallons of water to the river.

They managed to extract the bulk of the oil. However, that brutal but efficient operation wasn't an option elsewhere on the oiled river. All of that gouging would destroy fish habitat and ruin underwater beds where mussels feed and breed.

Other traditional cleanup methods were also proving harmful.

Ripping out oil-coated islands and oil-ravaged logs and plants deprived fish of vital shelter. And the steady beat of waves caused by so many boats on the water eroded the banks where muskrats and beavers burrowed for shelter.

Gradually, everybody agreed that they had to treat the river as a living organism, not as an entity to be conquered.

Enbridge began developing more gentle techniques. Workers on foot, in boats or in marsh buggies used rakes with metal tines, rototiller blades, chain drags or air- and water-spraying wands to gently agitate the oil by hand. Then they vacuumed it up or collected it with nets, booms and absorbent pads.

On average, the Kalamazoo is only about three feet deep, so instead of always using boats with standard engines that could tear up the shallow river, Enbridge brought in flat-bottomed "airboats" powered by raised aircraft-type propellers and engines.

Progress was slow. Nobody was surprised when Enbridge failed to meet the EPA's Oct. 31 deadline for removing all submerged oil from the river. A few days later, the company increased its estimate ^[14] of how much oil had spilled from 6B, from 819,000 gallons to 843,444 gallons.

But the news wasn't all grim.

On Nov. 5, Jim Rutherford, Calhoun County's public health officer, announced that people who lived near the river could once again drink and cook with their well water. No pollutants had been found, although the testing would continue.

Despite this reassurance, Deb Miller stuck with the bottled water. Instead of cooking her family's Thanksgiving dinner in Ceresco, she moved the celebration to her younger daughter's house a few miles away.

By this time, Enbridge also had managed to skim, vacuum and sop up most of the visible oil in the creek and river. It was a small step in the right direction, even though everybody was sure oil remained hidden in the waterways and floodplain.

EPA supervisors knew that Enbridge's first attempt to totally purge the creek of oil was a stopgap measure.

"It's kind of like doing an initial surgery," Ralph Dollhopf, the EPA incident commander, said about that effort. "It's done to get the gross amount of oil and get the situation stabilized. We knew residual oil would be identified afterward and we'd have to come back to meet long-term requirements."

The cleanup ramped down for the winter. By mid-December, only about 200 workers were on-site.

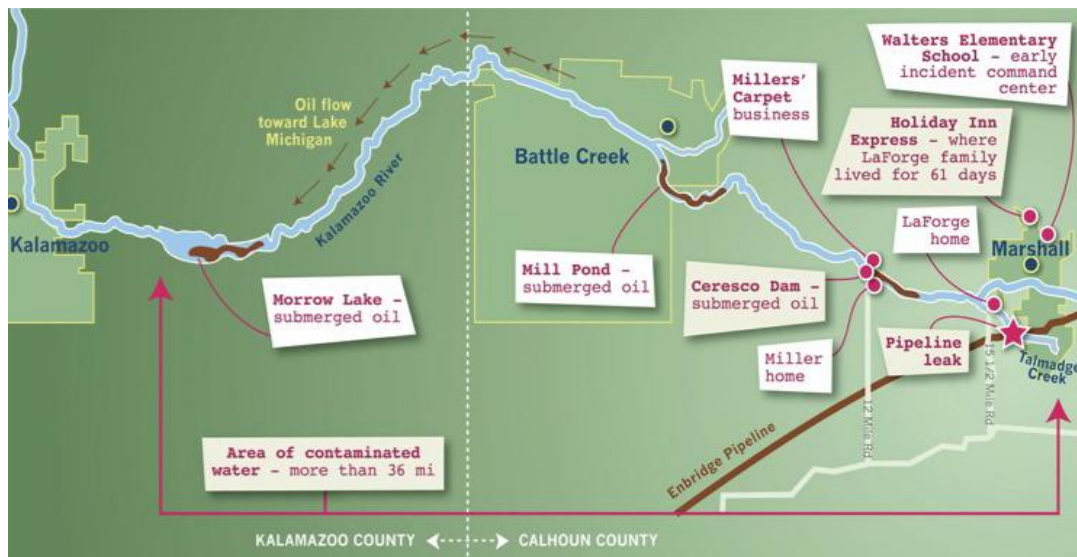
Before the year ended, Enbridge announced that it had been able to recycle 766,288 gallons of oil recovered from the spill site. Instead of sending it to a landfill, the company was able to return it to the pipeline terminal in Griffith, Ind., where it was again pumped through 6B.

In the spring of 2011, teams of scientists continued the tedious process of mapping the submerged oil. The digital snapshot that emerged confirmed their fears. Tar balls the size of marbles were still piling up in low spots on the river bottom.

Roughly 200 acres, an area about the size of 150 football fields, were still tainted with oil.

Three landmarks were identified as "oil magnets." One was above Ceresco Dam, next to the Millers' business, where they had dredged in October. The second was near the dammed Mill Pond in Battle Creek. The third was at the delta of Morrow Lake, where the river flows into a dammed recreation area before it reaches the city of Kalamazoo.

Click on map to enlarge



Map of the

rupture site and Kalamazoo River. Illustration by Catherine Mann for InsideClimate News. [15]

"The submerged oil is a real story, it's a real eye-opener," the EPA's Mark Durno told the Natural Resources Defense Council's OnEarth magazine. "In larger spills we've dealt with before, we haven't seen nearly this footprint of submerged oil, if we've seen any at all."

They were back to the problem they had started with: How would they tackle submerged oil that was a moving target?

John Sobojinski, the engineer who had supervised Enbridge's operation in Marshall since November 2010, said beating the river to death didn't make sense.

"You would have to run bulldozers and excavators down 38 miles of river and take out everything to get every last bit of oil," Sobojinski said. "The river would never recover."

Enbridge and the EPA devised a new plan that Dollhopf described as the "locate, clean up and repeat" approach. Instead of trying to scour the entire river bottom, they would let the tar balls roll into the three spots the scientists had pinpointed as oil magnets. As the tar balls accumulated, they'd go in and extract them. It was frustrating to have to wait out the oil, but the evolving science supported their patience.

"At a minimum, we're writing a chapter in the oil spill cleanup book on how to identify submerged oil," was how Dollhopf described the challenges they faced. "We're writing chapters on how it behaves once it does spill (and) how to recover it."

In some areas, Enbridge continued using the gentler cleanup techniques it had developed in the fall of 2010 to capture underwater oil. But elsewhere crews also tried a more mechanized—and harsher—approach to agitate and collect the dilbit. They fitted excavator buckets with rototiller blades, pulled chain drags and air- and water-spraying

wands and rototiller blades behind boats, and equipped pontoon boats with excavators that could pull chain drags.

In June 2011, the EPA gave Enbridge a new deadline: Finish the river cleanup by Aug. 31. But the company missed that deadline, too. More than 800 workers remained on the job.

The EPA's Susan Hedman no longer sounded so optimistic. "Capturing and cleaning up this heavy oil is a unique challenge," she told reporters ^[16] a year after the cleanup began. "No one at the EPA can remember dealing with this much submerged oil in a river."

As the cleanup slogged on, the people of Marshall were growing accustomed to the presence of the workers and the economic benefits they brought to their little community, which bills itself as the "City of Hospitality." Hotels were often full and workers were spending money at the Stagecoach Inn, the Dark Horse Brewery and Schuler's Restaurant and Pub, a historic landmark downtown.

Enbridge—whose slogan is "Where Energy Meets People"—tried to solidify that feeling of goodwill by donating money to an assortment of causes.

The company upgraded a park near Battle Creek that had been closed by the spill and paid for a new bridge between the park and a large river island. It built fishing and boating piers at five other recreational sites and set up an endowment fund to maintain them. It donated \$100,000 to the Calhoun County Trailway Alliance's hiking trail project and promised another \$100,000 if the alliance raised matching funds.

Other gifts included \$45,000 to United Way branches in Marshall, Battle Creek and Kalamazoo, \$50,000 to the Marshall school district and \$20,000 to the county fairgrounds.

Most people appreciated Enbridge's efforts. The vice president of a local conservation club, which received about \$25,000 from the company, said that ^[17] despite the tragedy of the oil spill he thought Enbridge was "really attuned to the environment."

A woman who accepted what she described as Enbridge's "generous offer" to buy her home on Talmadge Creek said "Everything they did was a class act. Everything."

Others, including Deb Miller, viewed Enbridge's generosity as a public relations gimmick.

"People say, 'Well, Enbridge is trying its best,'" Miller said while standing on the porch of her carpet business overlooking the river. "Well, maybe its best isn't good enough."

There's no end in sight. What's going to happen 10 years from now if the oil is still in the river?"

In October 2011, Enbridge CEO Patrick Daniel was named ^[18] "Canada's Outstanding CEO of the Year." In a statement announcing the honor, the president and CEO of Caldwell Partners, the law firm that founded the award, described Enbridge as "an exceptional community supporter having invested in hundreds of charitable and non-profit organizations across Canada and the United States."

On an unseasonably warm day in November, John LaForge drove with an InsideClimate News reporter past his old house near Talmadge Creek. Using money from his settlement with Enbridge, he had built a new house—as well as pole barns for his excavating and garbage-hauling businesses—four miles away. The family had moved in over the summer.

LaForge said he felt his settlement with Enbridge had been a fair one. But he still winced when he saw the cracks crisscrossing his once-immaculate concrete driveway—and when he noticed that someone had cut down the flowering crabapple he and his wife had planted in memory of their son, Justin, who died in a car accident at the age of eight.

From the vacant house he drove to a nearby neighborhood of ranches, colonials and luxury homes that had been built along the Kalamazoo over the last several decades. He had excavated some of the basements.

As he navigated the long horseshoe-shaped road, he periodically pointed to empty houses that Enbridge now owned.

"People make jokes that we live in Enbridgeville because they've bought everything," LaForge said. "They don't realize what people went through. That company thinks money can buy anything."

With another winter approaching, the Enbridge workforce tapered off to about 450. The focus would be on meeting EPA's new deadline for the creek cleanup: March 31, 2012.

The only way to be sure the creek would be oil-free, was to strip away the contaminated stretch, a little more than two miles. Essentially, crews would be building a creek from scratch. Dredging—the technique they'd considered too severe for the river—made sense here.

Contractors pieced together mazes of corduroy roadways and navigated their excavators, front-end loaders, graders and dump trucks along the floodplain. Then they

scraped the oily creek bed and its banks down to the bone, scooping out 21,578 cubic yards of dirt. Finally, they hauled in tons of "new" dirt, shaping it to follow the path the creek had traveled before the spill.

When they finished, the water ran as clear as ever through the reinvented portion of the creek. The only hint that something traumatic had occurred were the yards of landscaping cloth and erosion control blankets spread out to protect the newly planted native grasses and other vegetation. Tiny trees planted during the mild winter were already sprouting new roots.

Enbridge met the March deadline. And Jay Wesley, the fish expert with the Michigan Department of Natural Resources who has spent 16 years studying the watershed, was confident the creek would bounce back.

The only question was how long it would take Mother Nature to right herself. In 2000, a survey found 11 species of fish and 192 individual fish in that segment of the creek. A few weeks after the spill, Wesley and other natural resource specialists had counted just three species of fish and 53 individual fish.

On April 18, 2012—21 months after 6B ruptured—the first mile of the tainted section of the Kalamazoo River was opened to the public for boating and swimming. Jim Rutherford, the Calhoun County health director who had called for a voluntary evacuation after the spill, was also responsible for making this decision.

To celebrate their accomplishment that day, the EPA's Durno and a dozen other federal, state and local officials climbed into kayaks and paddled the cleaned-up portion between Perrin Dam and Saylor's Landing.

Durno, who takes a dip in Lake Erie every New Year's Day when he's home in Cleveland, wore his wetsuit. He slipped out of his kayak and swam for a few minutes in the 60-degree water.

Durno said he didn't see or smell any oil during his swim. But neither he nor anyone else involved in the cleanup suggests that all the oil is gone.

Technically, restoring the river to pre-spill conditions would mean removing every last tar ball, no matter the cost. But scientists have realized for months that would be foolhardy.

"Do we sterilize the river and destroy its ecology to restore it?" asked Durno. "That's the key question."

Teams of specialists using poles are now doing another survey, their third, to determine how much oil remains in the river's bottom. The results won't be in for a few weeks, but

the EPA's Dollhopf said they are "definitely seeing significant reductions from last year and the year before."

To plan their next steps, the scientists and the cleanup experts have sliced the river into ecological sections according to patterns of oil contamination, types of wetlands, and species of animals, plants and trees. Each section will be cleaned with the technology that works best for its unique situation. Heavily oiled sections might be tackled with more intrusive methods. Lightly oiled areas may be treated with nothing more than some bundles of pine and fir trees placed underwater to trap the tar balls that are still bouncing along the river's bottom.

"Some of those scenarios may involve leaving oil behind, so it's unlikely that every last drop of oil will be removed," said Dollhopf, who still works out of the cluster of temporary trailers near the rupture site, where the cleanup command post has been housed since the fall of 2010. "We don't want to cross over the balance point of the benefits of oil removal and the harm of oil recovery. We always have to weigh that."

On June 21, Rutherford opened about 34 more miles of the river. The only section that's still closed is a small stretch at the delta of Morrow Lake, which is marked off with buoys. The EPA estimates ^[19] that 1,148,229 gallons of oil have been recovered so far. Enbridge still maintains that its ruptured pipeline released only 843,444 gallons.

Rutherford said the water in the open section of the river now meets all necessary health and safety requirements. A study by the Michigan Department of Community Health said people who come into contact with the oil might suffer some skin irritation, but they won't experience long-term health problems.

Information kiosks at ramps along the river are now stocked with brochures citing that study and telling people what to do if they see or touch oil. The kiosks also have disposable wipes for removing oil from skin or boats.

After three and a half years of deliberating about whether to repair or replace 6B, Enbridge recently asked the Michigan Public Service Commission for permission to replace the line and almost double its capacity. Replacing 6B through Michigan and Indiana will cost close to \$1.9 billion. It will be 36 inches rather than 30 inches wide in most places and capable of pumping up to 21 million gallons of oil per day.

The expansion is needed, Enbridge says, to meet the growing demand of U.S. refineries for cheap Canadian dilbit.

Researcher Lisa Schwartz and InsideClimate News intern Kathryn Doyle contributed to this report.

See Also:

[The Dilbit Disaster: Inside The Biggest Oil Spill You've Never Heard Of, Part 1](#) [20]
[The Dilbit Disaster: Inside The Biggest Oil Spill You've Never Heard Of, Part 2](#) [21]
[Timeline: How the Dilbit Disaster Unfolded](#) [22]

Links:

- [1] <http://insideclimatenews.org/sites/default/files/epaspill7.jpg>
- [2] <http://www.amazon.com/dp/B008EKH5F6>
- [3] <http://www.insideclimatenews.org/news/20120626/dilbit-diluted-bitumen-enbridge-kalamazoo-river-marshall-michigan-oil-spill-6b-pipeline-epa>
- [4] <http://insideclimatenews.com/news/20120627/dilbit-kalamazoo-marshall-oil-spill-bitumen-enbridge-patrick-daniel-6b-pipeline-epa-tar-sands>
- [5] <http://www.documentcloud.org/documents/351569-enbridge-cong-test.html#document/p48/a61072>
- [6] <http://www.documentcloud.org/documents/371680-enbridge-form.html>
- [7] <http://www.documentcloud.org/documents/351569-enbridge-cong-test.html#document/p63/a61074>
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[26] <http://insideclimatenews.org/topic/kalamazoo-river>

[27] <http://insideclimatenews.org/topic/michigan>

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