



THE IMPACT OF TAR SANDS PIPELINE SPILLS ON EMPLOYMENT AND THE ECONOMY

A REPORT BY CORNELL UNIVERSITY GLOBAL LABOR INSTITUTE

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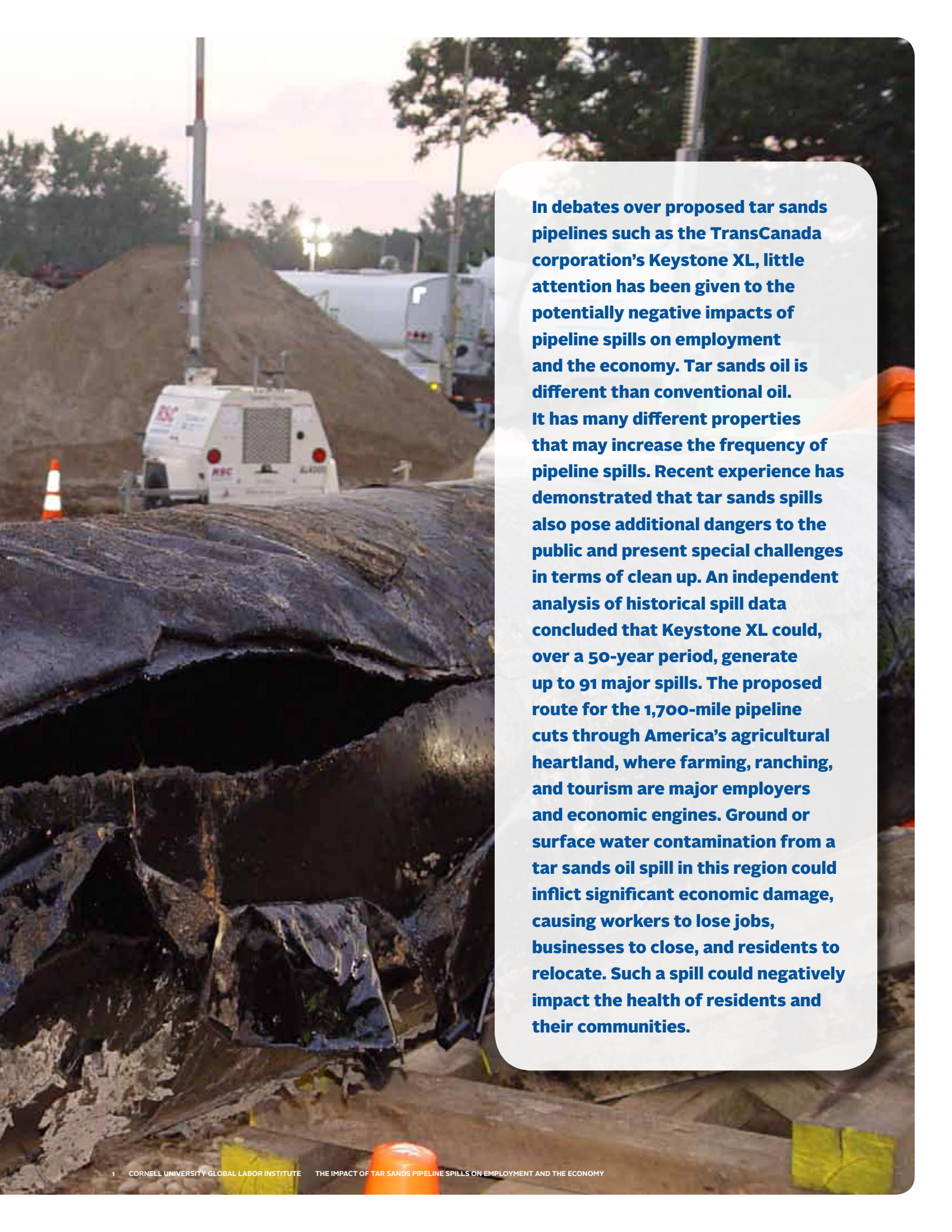
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In debates over proposed tar sands pipelines such as the TransCanada corporation's Keystone XL, little attention has been given to the potentially negative impacts of pipeline spills on employment and the economy. Tar sands oil is different than conventional oil. It has many different properties that may increase the frequency of pipeline spills. Recent experience has demonstrated that tar sands spills also pose additional dangers to the public and present special challenges in terms of clean up. An independent analysis of historical spill data concluded that Keystone XL could, over a 50-year period, generate up to 91 major spills. The proposed route for the 1,700-mile pipeline cuts through America's agricultural heartland, where farming, ranching, and tourism are major employers and economic engines. Ground or surface water contamination from a tar sands oil spill in this region could inflict significant economic damage, causing workers to lose jobs, businesses to close, and residents to relocate. Such a spill could negatively impact the health of residents and their communities.

ABOUT THIS REPORT

This report examines the potentially negative impacts of tar sands oil spills on employment and the economy. It draws attention to economic sectors at risk from a tar sands pipeline spill, particularly in the six states along Keystone XL's proposed route—Montana, South Dakota, Nebraska, Kansas, Oklahoma, and Texas. This report also shows how Michigan's Kalamazoo River spill in 2010—to date the largest tar sands oil spill in the U.S.—caused significant economic damage and negatively impacted the quality of life of local communities.

The information was collected from employment and economic data in the pipeline states, as well as from interviews with businesspeople, landowners, farmers, and ranchers who live and work along the proposed route for the Keystone XL or near the Kalamazoo River oil spill.

MAIN FINDINGS

- » The negative impacts on employment and the economy of tar sands pipelines have largely been ignored. To date, a comprehensive spills risk assessment for the proposed Keystone XL pipeline has not been conducted. Such an assessment would provide an independent review of both the risk of spills and their economic consequences.
- » The Keystone XL pipeline would cut through America's breadbasket. Agricultural land and rangeland comprise 79 percent of the land that would be affected by the proposed Keystone XL pipeline. It would cross more than 1,700 bodies of water, including the Missouri and Yellowstone rivers and the Ogallala and Carrizo-Wilcox aquifers. The Ogallala Aquifer alone supplies 30 percent of the groundwater used for irrigation in the U.S. It also supplies two million people with drinking water.
- » Farming, ranching, and tourism are major sources of employment along the Keystone XL pipeline's proposed route. Water contamination resulting from a Keystone XL spill, or the cumulative effect of spills over the lifetime of the pipeline, would have significant economic costs and could result in job loss in these sectors. Approximately 571,000 workers are directly employed in the agricultural sector in the six states along the Keystone XL corridor. Total agricultural output for these states is about \$76 billion annually.
- » Many of the land areas and bodies of water that Keystone XL will cross provide recreational opportunities vital to the tourism industry. Keystone XL would traverse 90.5 miles of recreation and special interest areas, including federal public lands, state parks and forests, and national historic trails. About 780,000 workers are employed in the tourism sector in the states along the Keystone XL pipeline. Tourism spending in these states totaled more than \$67 billion in 2009.

BETWEEN 2007 AND 2010, PIPELINES TRANSPORTING TAR SANDS OIL IN THE NORTHERN MIDWEST HAVE SPILLED THREE TIMES MORE OIL PER MILE THAN THE U.S. NATIONAL AVERAGE FOR CONVENTIONAL CRUDE.

SINCE THE FIRST KEYSTONE PIPELINE BEGAN OPERATION IN JUNE 2010, AT LEAST 35 SPILLS HAVE OCCURRED IN THE UNITED STATES AND CANADA. IN ITS FIRST YEAR, THE SPILL FREQUENCY FOR KEYSTONE'S U.S. SEGMENT WAS 100 TIMES HIGHER THAN TRANSCANADA FORECAST.

- » There is strong evidence that tar sands pipeline spills occur more frequently than spills from pipelines carrying conventional crude oil because of the diluted bitumen's toxic, corrosive, and heavy composition. Tar sands oil spills have the potential to be more damaging than conventional crude oil spills because they are more difficult and more costly to clean up, and because they have the potential to pose more serious health risks. Therefore both the frequency and particular nature of the spills have negative economic implications.
- » The largest tar sands oil spill in the U.S. occurred on the Kalamazoo River in Michigan in 2010. This spill affected the health of hundreds of residents, displaced residents, hurt businesses, and caused a loss of jobs. The Kalamazoo spill is the most expensive tar sands pipeline oil spill in U.S. history, with overall costs estimated at \$725 million.
- » According to the U.S. State Department, the six states along the pipeline route are expected to gain a total of 20 permanent pipeline operation jobs. Meanwhile, the agricultural and tourism sectors are already a major employer in these states. Potential job losses to these sectors resulting from one or more spills from Keystone XL could be considerable.
- » Renewable energy provides a safer route to creating new jobs and a sustainable environment. The U.S. is leading the world in renewable energy investments, and employment in this sector has expanded in recent years.

INTRODUCTION

Tar sands oil is transported through pipelines as diluted bitumen, a mixture of bitumen (raw tar sands) and light natural gas liquids or other volatile petroleum products. Spills from pipelines transporting diluted bitumen, conventional oil, and other hazardous liquids happen frequently—but their impact on workers, businesses, and communities is not widely recognized. Between 2002 and 2011, there were more than 3,700 pipeline spills in the U.S.¹ In 2010 alone, U.S. pipeline spills and explosions released more than 173,000 barrels of hazardous liquids into the environment and caused \$1.1 billion in damage.²

Over the past decade, the amount of diluted bitumen passing through U.S. pipelines has rapidly increased. In 1999, the U.S. on average imported 165,000 barrels of tar sands oil per day from Canada.³ By 2010, that number had risen to about 600,000 barrels per day.⁴ In 2019, the Alberta Energy Resources Conservation Board expects as many as 1.5 million barrels of diluted bitumen oil will be imported by the U.S. every day.⁵

There is evidence that pipelines transporting diluted bitumen tar sands oil have a higher frequency of spills than pipelines carrying conventional crude. Between 2007 and 2010, pipelines transporting diluted bitumen tar sands oil in the northern Midwest spilled three times more oil per mile than the national average for conventional crude oil.⁶ The relatively high spill record of pipelines transporting diluted bitumen has raised concerns about the spill potential of Keystone XL and other proposed tar sands pipelines.⁷ Diluted bitumen is heavier, more corrosive, and contains more toxic chemicals and compounds than conventional crude oil. There is also evidence that tar sands pipeline spills inflict more damage than spills from conventional crude pipelines. Tar sands oil spills are more difficult to clean up, and the diluted bitumen's toxic and corrosive qualities may increase the overall negative impacts to the economy and public health.

TRANSCANADA'S KEYSTONE XL PIPELINE

TransCanada is the Canadian oil pipeline company that in 2008 applied for a permit from the U.S. government to construct the Keystone XL tar sands pipeline. This proposal has attracted a high level of public attention and sparked a sharp debate about the economic and environmental implications of transporting additional tar sands into the U.S. If constructed, Keystone XL will transport more than 830,000 barrels of tar sands oil per day from Alberta, Canada, to heavy crude oil refineries in Texas. The 1,700-mile pipeline will pass through six U.S. states—Montana, South Dakota, Nebraska, Kansas, Oklahoma, and Texas. The pipeline will also cross 1,748 bodies of water, including the Missouri and Yellowstone rivers, and the Ogallala and Carrizo-Wilcox aquifers.⁸ While TransCanada's application to build Keystone XL has been denied, the company announced on February 27, 2012, that it expects to reapply for a presidential permit.⁹

TransCanada has claimed that Keystone XL will be the "safest pipeline in the U.S."¹⁰ However, since the initial Keystone 1 pipeline began operation in June 2010, at least 35 spills have occurred in the U.S. and Canada.¹¹ In its first year, the U.S. section of Keystone 1 had a spill frequency 100 times greater than TransCanada forecast.¹² In June 2011, federal pipeline safety regulators determined Keystone 1 was a hazard to public safety and issued TransCanada a Corrective Action Order.¹³



THE POTENTIAL IMPACT OF TAR SANDS SPILLS ON JOBS AND THE ECONOMY

In the debates on tar sands pipelines taking place in the U.S. and Canada, little attention has been given either to the risk of pipeline spills or to their economic impact. In the case of Keystone XL, discussion has mostly focused on the pipeline's potential to create jobs. Scant attention has been given to how *existing* jobs and economic sectors would be impacted from Keystone XL leaks and spills. A comprehensive and independent spill risk assessment for the Keystone XL pipeline has yet to be conducted. Such an assessment is needed in order to thoroughly consider both the risk of spills and their economic consequences, including negative impacts on employment.¹⁴

Major sources of employment along the proposed pipeline route—particularly farming, ranching, and tourism—depend on a clean supply of water. Contamination resulting from a Keystone XL spill, or the cumulative effects of spills over the lifetime of the pipeline, would generate significant economic costs and could result in job loss in these sectors. About 571,000 workers are directly employed in the agricultural sector in the six states along the Keystone XL corridor. The total agricultural output for these states is \$76.3 billion.¹⁵ Moreover, tourism spending totaled more than \$67 billion in 2009 and tourism employed about 780,000 people.¹⁶

TRANSCANADA INFLATES KEYSTONE XL JOB NUMBERS

TransCanada has stated that pipeline construction would create 20,000 direct construction and manufacturing jobs in the U.S.¹⁷ The Cornell Global Labor Institute (GLI) examined data TransCanada submitted to the State Department. GLI estimated between 2,500 to 4,650 temporary, direct jobs would be created per year by pipeline construction over a two-year span.¹⁸ The State Department's evaluation of Keystone XL's job-creation potential produced similar results.¹⁹

TransCanada's claim that 7,000 U.S. manufacturing jobs would be created by the construction of the pipeline is unsubstantiated. The project's main material input is steel pipe, and as of

September 2011 TransCanada had manufactured approximately 50 percent of the pipe in India and Canada.²⁰ TransCanada also states that Keystone XL would generate 119,000 "person years" of employment, which includes direct, indirect, and induced jobs.²¹ GLI estimates that construction of Keystone XL would create between 33,000 and 44,000 person years of employment. This is between 30 and 40 percent of the job numbers estimated by TransCanada.²² The State Department's Report to Congress in January 2012 following the presidential denial of the permit also concluded that TransCanada's numbers were inflated.²³

THE POTENTIAL IMPACT OF SPILLS ON AGRICULTURE AND TOURISM

A preliminary analysis of the major employers and the economic profiles of the six states along the proposed pipeline route suggests that significant leaks or spills from Keystone XL could negatively impact employment and the economy—particularly in the agriculture and tourism sectors. The 2010 Enbridge pipeline tar sands spill into the Kalamazoo River incurred significant economic costs and degraded the quality of life in surrounding communities. There appears to be a considerable risk of similar spills with Keystone XL and other tar sands pipelines.

KEYSTONE XL CROSSES 1,748 BODIES OF WATER, FOUR MAJOR RIVERS AND OGALLALA AQUIFER IN NEBRASKA AND CARRIZO-WILCOX AQUIFER IN TEXAS

A leak or a spill into a body of water close to the proposed Keystone XL could contaminate drinking water for residents and livestock, and it could also contaminate irrigation water for farmers' crops. TransCanada's proposed route for Keystone XL had the pipeline crossing a section of the Ogallala Aquifer, which alone supplies 30 percent of U.S. groundwater used for irrigation. The aquifer also supplies two million people with drinking water.²⁴

A study conducted by Dr. John Stansbury at the University of Nebraska estimated that 91 significant Keystone XL spills can be expected over 50 years.²⁵ The study also considered the potential damage caused by a worst-case scenario spill into the aquifer:


“...[T]he benzene released by a Keystone XL worst-case spill to groundwater in the Sandhills region of Nebraska would be sufficient to contaminate 4.9 billion gallons of water at concentrations exceeding the safe drinking water levels. [The spill] would pose serious health risks to people using that groundwater for drinking water and irrigation.”²⁶

A major spill from Keystone XL could extend hundreds of miles into major rivers, impacting drinking water intakes, aquatic wildlife, and recreation areas for hundreds of thousands of people, with the potential to affect cities like Omaha, Nebraska, and Kansas City, Missouri.²⁷

AGRICULTURE IS A MAJOR EMPLOYER IN THE PIPELINE STATES

Contamination from a Keystone XL spill could have a negative effect on individuals and businesses that depend on farming and ranching. Agricultural land (4,656 acres) and rangeland (11,122 acres) comprise 79 percent of the land area affected by the proposed Keystone XL pipeline.²⁸ The farms and ranches along this corridor depend on clean water. Concerns about water contamination from a pipeline spill prompted the National Farmers Union and its affiliates in Nebraska, Montana, South Dakota, and Kansas to oppose the Keystone XL pipeline.²⁹ In 2011, ExxonMobil's oil pipeline ruptured and spilled into the Yellowstone River in Montana, contaminating 3,200 acres, much of which was farmland and ranchland.³⁰ Property owners in the spill area have filed a class-action suit for damage to their land and businesses.³¹

In Nebraska, 93 percent of the total land area affected by the pipeline is utilized for farming. The Keystone XL pipeline would carve a 255-mile strip through dozens of Nebraska farms.³² The Keystone XL pipeline would also cross numerous waterways, including two rivers, the Niobrara and the Elkhorn, that are sources



Despite TransCanada’s assurances, we know there will be leaks and spills. All pipelines have some sort of leak during their operating lifetimes. It is not a matter of if, it is a matter of when, how often, and how much leakage there will be...When a leak happens, it will be [the farmers’] drinking water, their livestock water supply, and their irrigation supply that will be contaminated. Their economic well-being is directly impacted by spills and leaks...³³ [In addition], ‘temporary’ loss of agricultural productivity of the land is acknowledged. At issue are topsoil degradation, soil compaction, and introduction of rock.³⁴

*—JOHN K. HANSEN,
PRESIDENT, NEBRASKA FARMERS UNION*

“We are landowners along the proposed Keystone XL pipeline route and downstream from the Missouri and Yellowstone river crossings who are concerned about the impact that another spill would have on our families’ health, water quality, and ability to make a living on the land in Montana.”³⁵⁵

*—REPRESENTATIVES OF THE NORTHERN PLAINS
PIPELINES LANDOWNERS GROUP*

Tourism is the second-largest industry in South Dakota. In 2006, travelers spent nearly \$865 million across the state... The state also has a strong agricultural base. It is the largest industry in the state. South Dakota routinely ranks among the top 10 states for the production of hay, sunflowers, rye, honey, soybeans, corn, wheat, and cattle.³⁷

—SOUTH DAKOTA DEPARTMENT OF TOURISM

“My family farms and ranches organically on 1000 acres of land, most all of which is just downhill and downstream of the proposed pipeline. We have a lot of surface water that runs through our property, down to the Cedar River. So if a leak or spill were to happen at the point where the pipe crosses our farm, it would affect us very badly. I have 5 grandchildren on my farm that I would like to be able to work here, farming and agri-tourism, but if something happens with this pipeline, they won’t have that opportunity.”³⁶

*—JIM KNOPIK,
ORGANIC FARMER, NEBRASKA*



of drinking water for people and for livestock, and used for crop irrigation.³⁸ Both of these rivers eventually join the Missouri River, also a major resource for communities, farmers, ranchers, and the tourism industry. According to the U.S. State Department, the states along the pipeline corridor are expected to gain a total of 20 permanent pipeline operation jobs from Keystone XL.³⁹ Meanwhile, the agricultural sector is already a major employer and an economic engine in these states. The extent of the potential damage to this sector resulting from one or more spills from Keystone XL would of course depend on the size and location of any given spill. But if a major source of water was to become contaminated, or became inaccessible due to clean-up operations, the damage could be considerable.

THE CONSTRUCTION PHASE OF THE KEYSTONE XL PIPELINE WOULD DISRUPT FARMERS AND RANCHERS

Pipeline construction would bring its own disruptions to farmers and ranchers along the proposed route.⁴⁰ Bulldozers and backhoes would be deployed to scrape and flatten the land, and then dig a trench to lay the pipe. This process would take weeks. It would disrupt farms that produce soybeans, wheat, and other crops.⁴¹ Once the pipe is laid, farmers would have to begin restoring the land in order to replant and harvest crops in the affected area. The process of laying the pipe is particularly worrisome for organic farmers who risk losing their organic certification if chemicals, such as those from machinery fuel, contaminate their soil.⁴² Moreover, after their land is disturbed and compacted by heavy machinery, organic farmers cannot use chemicals to restore their cropland.⁴³ To maintain their organic certification, these farmers can only use natural methods to return a healthy mix of nutrients to their soil.⁴⁴

KEYSTONE XL WILL CROSS LAND AND BODIES OF WATER THAT SUSTAIN THE RECREATIONAL TOURISM INDUSTRY

Many of the bodies of water that Keystone XL is expected to cross provide recreational activities that are important to the tourism industry. Land and waterways can be inaccessible for months or years following a spill. For example, 35 miles of the Kalamazoo River remain closed more than 18 months after the 2010 spill.⁴⁵ Fishing, canoeing, kayaking, and other recreational activities have ceased on the contaminated section of river.

Keystone XL will cross approximately 90.5 miles of recreational and special interest areas in Montana, South Dakota, Nebraska, Oklahoma, and Texas.⁴⁶ These areas include state and federal public lands, recreational waters, state parks and forests, national historic trails, wildlife refuges, and wildlife management areas.⁴⁷ Keystone XL will also cross six historic trails (including Lewis and Clark, Pony Express, Oregon, and El Camino Real de los Tejas) and two scenic byways that draw tourists from around the world (Big Sky Back Country Byway and Historic Route 66).⁴⁸

In the six states along the pipeline route, travel expenditures by visitors totaled \$67 billion in 2010, and approximately 780,000 workers are employed in the tourism sector.⁴⁹

AGRICULTURE IN THE PIPELINE STATES

TEXAS IS RANKED

NO. 2

IN THE U.S. FOR
AGRICULTURAL
SALES⁵⁰

570,921 WORKERS

ARE DIRECTLY EMPLOYED IN THE
AGRICULTURAL SECTOR IN THE
SIX PIPELINE STATES⁵¹

MORE THAN

75,000

KANSANS ARE
DIRECTLY
EMPLOYED
IN THE
AGRICULTURAL
SECTOR⁵²

THERE ARE
507,900
FARMS
IN THE
PIPELINE STATES⁵³

ONE
IN EVERY
THREE

NEBRASKA JOBS
IS RELATED TO
AGRICULTURE⁵⁴

NEBRASKA'S LARGEST
INDUSTRY IS
AGRICULTURE⁵⁵

TOTAL AGRICULTURAL
OUTPUT OF THE
PIPELINE STATES IS

\$76.3
BILLION⁵⁶

IN NEBRASKA,
EVERY \$1
IN AGRICULTURAL
EXPORTS
GENERATES
\$1.36
IN ADDITIONAL
ECONOMIC
ACTIVITIES⁵⁷

IN KANSAS
IN 2010, TOTAL
AGRICULTURAL
OUTPUT WAS
MORE THAN
\$15 MILLION⁵⁸

WHEN A SPILL HAPPENS: SOCIAL AND ECONOMIC DISRUPTION ALONG THE KALAMAZOO RIVER

The largest-ever U.S. tar sands oil spill occurred on July 25, 2010. The Enbridge corporation's Lakehead Pipeline System 6B ruptured about one mile from the town of Marshall, Michigan.⁵⁹ Despite multiple alarms and warning signals, operators did not shut down the 30 inch diameter pipeline until almost 12 hours after the spill began.⁶⁰ It took an additional six hours to identify the spill's location.⁶¹ During this time more than one million gallons leaked from a 6.5 foot gash, the cause of which remains unknown.⁶² The spill originated in an open field, but the oil flowed into Talmadge Creek and eventually traveled about 40 miles downstream along the Kalamazoo River to Morrow Lake.

The Kalamazoo spill has been especially difficult and expensive to clean up because it consisted of diluted bitumen. Conventional oil spill response techniques rely on containing oil on the surface of bodies of water. In the case of the Kalamazoo spill, as the diluted bitumen flowed down the Kalamazoo, the two main tar sands oil materials—bitumen and diluents—separated, leaving the heavier bitumen to sink.⁶³ As of February 2012, tar sands oil remains submerged in multiple locations. The cleanup, which was originally projected by Enbridge to cost between \$300 million and \$400 million, is now projected to cost \$725 million.⁶⁴ The river remains closed and the cleanup is expected to continue through 2012. Officials have acknowledged that some bitumen will remain on the riverbed indefinitely.⁶⁵

RESIDENTS SUFFER HEALTH PROBLEMS

Immediately following the spill, people living near Talmadge Creek and the Kalamazoo River started reporting “strong, noxious odors and associated health symptoms” to their local public health departments.⁶⁶ Air-quality monitoring found elevated levels of benzene at multiple locations along the river during the first week after the spill.⁶⁷ For several weeks residents were not informed that the oil spilled was actually diluted bitumen.⁶⁸

According to a 2010 report by the Michigan Department of Community Health, between July 26 and September 4, health care providers identified 145 patients who had reported illness or symptoms associated with exposure to the oil spill.⁶⁹ One patient exhibited eight related symptoms and was classified by medical personnel as having “major” effects (defined here as symptoms that can cause disability or are life-threatening).⁷⁰ In addition, the Michigan Department of Community Health and the Calhoun County Public Health Department conducted a door-to-door survey, which included 550 people from four communities and one workplace along the river. Fifty-eight percent of the people included in the survey reported adverse health effects.⁷¹ The most common symptoms reported in the surveys and in hospital visits included headaches, respiratory problems, and nausea.⁷² Local and state health departments, together with Enbridge and the Environmental Protection Agency, continue to monitor the air, water, and soil quality along impacted areas.⁷³ However, there are currently no plans to study or monitor the spill's long-term health impacts. Similarly, there are no plans to calculate the economic costs related to residents' health problems.



“With all our regrets, we are sad to inform you that Shady Bend Campground is Permanently Closed [d]ue to the Oil Spill, July 27, 2010. We would like to thank all of you who have camped, canoe[d] or tub[ed] with us the past 22 seasons...It was a very difficult decision for us to make but not knowing when we could open again our choice was to sell our home, liquidate Shady Bend and move on to the next chapter of our lives.”⁷⁴

**—MARK, DIANE, MELISSA, AND BRANDI LEBLANC
SHADY BEND CAMPGROUND**

DISRUPTIONS TO RESIDENTS AND BUSINESSES

Following the spill, Enbridge developed a home buyout program for residents living directly along Talmadge Creek and the Kalamazoo River. The home purchasing program was offered to people whose properties were located in an area identified as the “red zone,” or within 200 feet of the affected waterways. About 200 homes were identified for this program, which expired one year after the spill.⁷⁵ Enbridge purchased at least 130 homes, 114 homes in Calhoun County and 16 in Kalamazoo County.⁷⁶ However, the majority of homes in those two communities are located more than 200 feet from the river and generally these homes were not included in the home buyout program. Unless they also served as a residence, commercial and industrial properties along the river were also excluded.⁷⁷

Some residents have expressed concerns regarding how both the spill itself and the home buyout program will impact property values.⁷⁸ As of February 2012, only one property has been resold, so the long-term impact on the real estate market remains unclear.⁷⁹ The long-term quality of life impact on a small community with a relatively large number of displaced residents is also unknown.

The impact of the Kalamazoo spill on businesses was not severe because most of the affected properties were residences. Had the spill occurred closer to commercial properties, the damage to businesses would likely have been more serious. However, the spill caused some business closures and job losses. A local campsite was forced to close, as was a daycare center. The daycare center employed about 12 people; the campsite was family-owned.

Debra Miller is a Ceresco resident whose small business survived the spill but suffered negative impacts. Her family-run carpet store, which opened in 1989, is less than four miles from the source of the spill, and close to a dam on the Kalamazoo River that served as an oil collection site. Miller estimates that

RISKS OF TAR SANDS OIL PIPELINE SPILLS

Unlike the more viscous and free-flowing conventional crude oil, the tar sands oil that Keystone XL will carry is a rougher mixture of raw tar sands plus natural gas liquids or other volatile petroleum products. Diluted bitumen contains higher concentrations of hazardous materials and toxins than are found in conventional crude oil, and it is also more abrasive and corrosive.⁸⁰ Tar sands pipelines also transport oil under high pressure and at high temperatures. This means a small rupture can produce a large spill and cause significant damage. Once exposed to oxygen, the highly flammable volatile chemicals used to dilute bitumen increase the risk of explosion.⁸¹

Diluted bitumen tar sands pipeline leaks are more difficult to detect than conventional oil leaks. As diluted bitumen flows through a pipeline, pressure changes within the pipeline can result

in the formation of gas bubbles that can impede the oil's flow. Sometimes these gas bubbles send faulty signals to detection systems. Because of this phenomenon, real leaks may go unnoticed by operators if they assume the leaks are gas bubbles.⁸² Moreover, if a spill occurs in a remote area, it could take a long time for the necessary equipment to be transported to the site of the spill.⁸³

Diluted bitumen's viscosity presents unique challenges. In the case of conventional oil spills, the crude oil floats on water and can be skimmed from the surface of rivers and streams. Diluted bitumen is similarly lighter than water, but when exposed to the air the diluents quickly evaporate, leaving heavy bitumen that then sinks beneath the surface. This was the case with the Kalamazoo River spill.⁸⁴



“Enbridge compensated us for the initial shutdown of our business, but we are concerned about the long-term impact that the spill has had on our business... One-and-a-half years later our business is still suffering financially and dealing with the problems created by the spill is taking a serious toll on my available time. The area is still a construction zone, which deters customers. I also suspect that some customers feel that the smell and toxins from the spill somehow affected the carpets, even though it hasn’t. All I know is this is the worst year we’ve ever had.”⁸⁵

—DEBRA MILLER, CARPET STORE OWNER

because of the spill her business profits are 35 percent lower than their pre-spill levels. In the months immediately following the spill, workers required regular access of Miller’s property in order to conduct cleanup operations. Miller said that more than 100 cleanup workers came onto her property with trucks and equipment, blocking the roads and preventing public access to both her office and her warehouse. The business was also closed for 13 weeks to facilitate cleanup efforts.⁸⁶

The experience of Kalamazoo residents and businesses provides an insight into some of the ways a community can be affected by a tar sands pipeline spill. Pipeline spills are not just an environmental concern. Pipeline spills can also result in significant economic and employment costs, although the systematic tracking of the social, health, and economic impacts of pipeline spills is not required by law. Leaks and spills from Keystone XL and other tar sands and conventional crude pipelines could put existing jobs at risk. In order to determine the full economic, employment, and social impacts of the proposed Keystone XL pipeline and similar pipelines, both the risks and their potential economic and social impacts should be given careful consideration.

“Many people in my community did not want to sell their homes, but felt they had no choice since the spill was negatively impacting the health of their families and they were worried about the decrease in property value...There are many streets that now have five or six empty homes on the side of the road near the river, while the people on the other side are still living there, as they were not offered the buyout program.”⁸⁷

—SUSAN CONNOLLY, RESIDENT OF MARSHALL, MICHIGAN

ALTERNATE ROUTE—RENEWABLE ENERGY AND THE CLEAN ECONOMY

AMERICA LEADS THE RENEWABLES REVOLUTION

In 2011, the U.S. eclipsed China to become the world's leading investor in renewable energy. The U.S. now leads the world in wind power generation. In the last four years, more than a third of the nation's new power capacity has come from wind. Solar power has also grown—by nearly 50 percent annually since 2005. This includes a 70 percent growth rate in the first half of 2011, despite the sluggish economy.⁸⁸ Nine in ten Americans say developing clean and renewable energy sources should be a priority for the President and Congress.⁸⁹

Investing in renewable and clean energy creates jobs. For every

\$1 million invested, 16.7 jobs are created. By contrast, \$1 million invested in fossil fuels generates 5.3 jobs.⁹⁰ A \$150 billion investment in the fossil fuel industry would create about 788,000 jobs. That same investment in clean energy would create more than 2.5 million jobs.⁹¹

The jobs advantage renewable energy has over fossil fuels is demonstrated by a comparison between the coal and wind industries. Coal currently provides 49 percent of the nation's electricity, and it employs about 80,000 people in mining.⁹² Wind currently

**CLEAN ENERGY
JOBS PAY
ABOUT
13 PERCENT
MORE
THAN JOBS IN
THE BROADER
ECONOMY⁹³**

generates 1 percent of the nation's electricity, and it already employs about 85,000 people. Today more than 400 facilities in the U.S. manufacture wind turbine components.⁹⁴



A CLEAN ENERGY ECONOMY TRANSLATES TO MORE JOBS

The renewable energy industry is growing at twice the rate of the overall economy. Today the clean energy economy employs 2.7 million workers overall.⁹⁵ Between 2003 and 2010—a time when many industries were cutting jobs—clean energy economy employers added 500,000 jobs.⁹⁶ In contrast, the top five oil companies generated \$546 billion in profits between 2005 and 2010, but reduced their combined U.S. workforce by 11,200.⁹⁷

Renewable energy's job creation potential has barely been tapped. Realizing this potential will require proper policy decisions.

IN THE U.S.,
WIND
CURRENTLY
EMPLOYS
85,000
WORKERS, AND
SOLAR
EMPLOYS
100,000⁹⁸

For example, extending the Treasury Grant Program under the American Reinvestment and Recovery Act would create an

additional 55,000 jobs in wind and 45,000 in solar.⁹⁹

Other countries have demonstrated the economic effects on the energy sector when clean energy is encouraged. Germany is one example. In 2010, more than 370,000 people were employed in renewable energy in Germany. That almost equals the number of jobs in the country's largest manufacturing industry (automobiles).¹⁰⁰

A major commitment to clean and renewable energy in the U.S. would lead to a cleaner environment and job growth.

NORTHERN GATEWAY

Keystone XL is one of several tar sands pipelines that has the potential to put at risk both public health and jobs in agriculture and tourism. In Canada, pipeline company Enbridge has proposed the 730-mile Northern Gateway tar sands pipeline, which would transport an average of 525,000 barrels of tar sands oil per day from Alberta to the Pacific Coast.¹⁰¹ The pipeline would cross more than 750 rivers and streams and pass through the headwaters of three of the continent's most important watersheds—the Mackenzie, the Fraser, and the Skeena.¹⁰² The pipeline would follow the Morice River to the Coast Mountains, cross the headwaters of the Zymoetz River, and then follow

the Kitimat River down to the coastal town of Kitimat. At Kitimat, a tank farm at the edge of the water would facilitate the transfer of oil to holding tanks and then into large oil supertankers. These supertankers would then traverse 100 miles of inner-coastal waters. Although not discussed in detail in this report, the Northern Gateway pipeline crosses numerous rivers and water bodies that are the source for the multi-billion dollar Pacific Northwest fishing industry. A tar sands oil pipeline spill could contaminate these waters, negatively impacting one of the region's largest industries, and the many jobs and livelihoods linked to this industry.

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ABOUT THE GLI

The GLI is part of Cornell University's School for Industrial and Labor Relations (ILR), the leading U.S. university program specializing in labor relations. Through research, education and training and policy development, the GLI works with trade unions in the U.S. and internationally to develop solutions to major social, economic and environmental challenges. The goal of the Institute is to help union officers, staff and activists gain a deeper understanding of the policies and institutions that shape today's world, assist in bringing unionists based in different countries into contact with each other for meaningful discussion on strategy and policy, and facilitate dialogue between unions, civil society organizations and movements committed to global justice.



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