



MICHIGAN  
Environmental  
Council

To: Members of the Senate Energy and Environment Committee  
From: Charlotte Jameson, Chief Policy Officer, Michigan Environmental Council  
Re: Testimony on Carbon Capture and Sequestration Regulation in Michigan  
Date: November 27th, 2024

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The Michigan Environmental Council is opposed to SB 1131 (S-1), 1132, and 1133 because the bills lack needed protections for our drinking water, foist unknown and potentially significant long-term liability on the people of Michigan, omit a needed permitting system for the actual capture technology, and fail to prepare communities and first responders in the event of a pipeline rupture or sequestration project leak.

Carbon capture and sequestration are technologies that capture carbon dioxide, or CO<sub>2</sub>, from polluting facilities such as fossil-fueled power plants and industrial sites. The carbon is then compressed and transported, usually by a network of pipelines, to sites where it is either sequestered underground or used to recover more fossil fuels. It is a very complex and expensive process that poses significant risks to our water, air, and public safety if adequate protections are not included in a regulatory system.

We believe strongly that the state should develop state specific regulations and protections for Michigan's climate, water, and people. It is insufficient to just reference federal regulations, especially given the constantly changing nature of federal regulations in recent years.

Below we detail the main challenges that arise in developing a carbon capture and sequestration program and the common sense safeguards that should be incorporated into a regulatory regime.

### **Water Contamination**

Leaks from the pipelines used to transport the CO<sub>2</sub> or from the sequestration site can and have contaminated groundwater and drinking water. When CO<sub>2</sub> comes into contact with water it can form carbonic acid. Increased acidity of the water dissolves minerals, releasing potentially harmful substances, such as arsenic and uranium, into groundwater. Brine itself is highly toxic, containing large concentrations of salts and often heavy metals, volatile organic compounds, and radionuclides like radium.

Three potential pathways for leaks from a sequestration site are: corrosion in the tubing and

pipeline at the well site, CO<sub>2</sub> migrating up the well anytime after injection, and pressurization forcing the brine from the injection area into the aquifer. These are not unfounded concerns. A few months ago, news broke that the country's first commercial CO<sub>2</sub> sequestration project in Illinois had two leaks.

Michigan is very dependent on our groundwater for drinking water. We should ensure any carbon capture and sequestration regulation that is adopted has the strongest safeguards for our groundwater.

*Safeguards needed:* Significant monitoring and long term monitoring (at least 30 years); site selection requirements and restrictions to minimize the risk of leaks and potential water contamination; requiring a water impact assessment that reviews which water sources will be used for CCS, the method that will be used for pumping and the impact on water quality during operations, end of life and under drought conditions; require funding for groundwater mapping, and notification and planning in the event a groundwater aquifer is contaminated.

### **Public Safety and Pipelines**

Pipelines carrying CO<sub>2</sub> from the polluting facility to a sequestration site also pose risks to public safety. In 2020 a CO<sub>2</sub> pipeline rupture in Mississippi resulted in the hospitalization of more than 45 people and the evacuation of more than 200 people. According to eyewitness reports, cars stopped working, which hampered emergency response. People lay on the ground, shaking and unable to breathe, and first responders were unaware of what was causing the issues.

Like with sequestration sites, pipelines carrying CO<sub>2</sub> are at risk of rupture due to the corrosive nature of carbonic acid. In Mississippi, federal investigators found that rain in the preceding months had caused the soil under the pipeline to shift, causing a section of pipe to break and expose the CO<sub>2</sub>.

When CO<sub>2</sub> leaks, it vaporizes into a gas that is heavier than air, sinking low to the ground. In low-lying areas or valleys, pockets of accumulated CO<sub>2</sub> can quickly reach deadly levels, causing animals and people to become unconscious within a minute. Health effects of CO<sub>2</sub> poisoning include headaches, nausea, convulsions, cardiac arrest, and death.

But while injection wells for sequestration have some rules and regulations at the federal level, we are woefully behind in regulations for CO<sub>2</sub> pipelines. The federal Pipeline and Hazardous Materials Safety Administration (PHMSA) is working on updating safety regulations for CO<sub>2</sub> pipelines. Recently passed legislation regulating CCUS projects in Illinois placed a moratorium on CO<sub>2</sub> pipeline construction until the PHMSA regulations are adopted. We would encourage Michigan lawmakers to pursue a similar approach.

Additionally, we need emergency planning and preparedness requirements in any regulation we adopt in Michigan. Pipeline operators should be required to perform complex, advanced modeling of potential pipeline ruptures and develop a risk-based assessment and

contingency plan. These should be published on a public website and given to local first responders. In addition to robust emergency planning we need significant funding for first responders in communities where pipelines are sited. Often these communities are operating volunteer first responder units and don't have the capacity to respond to a major event. Pipeline operators should cover the costs of the additional emergency response needs.

*Safeguards needed:* moratorium on pipeline construction until the PHMSA rules are done, requirements around emergency planning and preparedness, notifications for first responders, and funding for first responders.

### **Air Quality and Climate**

If not done properly carbon capture has the potential to increase carbon emissions and local air pollutants. Carbon capture produces its own emissions because energy is needed to run the capture technology. "Energy penalty" is the term used to describe the extra energy necessary to power capture equipment. This energy is drawn either from the plant where the equipment is installed or from a separate power source, generally another fossil generation unit. When capture equipment is added to a facility, it can increase the total amount of energy/fuel consumed by the facility, reduce the usable energy output of the facility, or both. Carbon capture's energy penalty can be quite substantial. The Intergovernmental Panel on Climate Change (IPCC) indicated that the energy penalty increases the fuel requirement for electricity generation by 13–44%. The higher the energy penalty the less effective the capture technology is at reducing net emissions. Any state program that regulates carbon capture should create a permitting program to ensure that we are reducing overall emissions through the capture technology.

Carbon capture technology could also increase the emissions of harmful air pollutants. Because of carbon capture's energy penalty, burning fossil fuels to power the process increases pollutant emissions on site. And, because CCS relies on underlying facilities by design, CCS retrofits risk exacerbating pollution and environmental injustice in communities already burdened by existing polluting facilities.

Illinois adopted a law that would minimize the impact of the energy penalty and ensure they don't see an increase in harmful air pollution from the capture. Their law requires that existing facilities that seek a permit for carbon capture must provide a greenhouse gas (GHG) analysis that examines the emissions from the facility where the CO<sub>2</sub> is "captured" as well as emissions from where the facility gets its power. To get a capture permit, the analysis must show that for each year over the course of the capture facility's operating life, captured GHGs will exceed emitted GHGs. The law also prohibits the use of CO<sub>2</sub> captured in Illinois for enhanced oil recovery. The Illinois law also requires that facilities show that capturing carbon will not increase emissions of harmful air pollutants like particulate matter and NO<sub>x</sub>.

*Safeguards needed:* Legislation creating a permitting regime for the capture of emissions

that includes requirements to prevent capture leading to an increase in GHG emissions and/or air pollution.

### **State Liability and Fee Per Ton**

Carbon sequestration is an unproven technology that faces multiple feasibility constraints and an uncertain future. The people of Michigan should not assume any liability for sequestration projects. The Illinois law specifies that the operator of the sequestration facility, not the state, is responsible for any personal or property damage caused by the sequestration. It clarifies that the sequestered gas remains the property of the operator of the sequestration, not the owner of the pore space.

We should use the fee charge per ton of stored carbon for climate mitigation and adaptation projects and for groundwater mapping. The operators of a carbon sequestration site should cover the costs for air and water monitoring and for management of the site while in operation and any post-closure care. Michigan should set a realistic fee charge to better cover these costs. Current drafts have the fee set at 8 cents per ton, while in Illinois they set the fee at 62 cents per ton.

*Safeguards needed:* Keep liability with the operator of the sequestration facility, set the per ton fee at a reasonable rate, use the fee for additional projects like groundwater mapping, climate mitigation, and first responder preparedness.

### **Property Rights and Severability**

Care should be taken when crafting this legislation to consider appropriate landowner rights. Current drafts allow pore space to be utilized for carbon storage projects if 60% of the pore space owners agree to the plan. Other states, such as Illinois, have raised this threshold of consent to 75% of owners. Owners who do not consent can be easily overruled by the majority and should be fairly compensated and offered remedial services in the case of leaks.

Michigan should also be explicit that pore space rights cannot be severed from land surface rights of landowners. If pore space rights can be severed and sold separately from land surface rights, future home buyers may be unaware of activity happening below their land and may not even be aware that the space under their land has previously been sold. We can better protect future and current landowners by ensuring that pore space is not severable from surface rights.

*Safeguards needed:* Explicitly establish that pore space rights are not severable from surface rights, add guardrails to ensure that the 'fair market rate' for pore space is adequate compensation for non-consenting landowners and that remedial services are offered in the case of leaks.