Testimony of Nichole Saunders
Director & Senior Attorney
Environmental Defense Fund

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"The Opportunities and Risks of Offshore Carbon Storage in the Gulf of Mexico"
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Thank you for the opportunity to appear before you today to discuss offshore carbon storage in the Gulf of Mexico. Environmental Defense Fund (EDF) is a non-profit environmental research and advocacy organization working to identify science- and market-based solutions to major environmental challenges.

Capture of industrial and atmospheric carbon dioxide (CO_2) has been identified in numerous scientific reviews as a potentially useful and even essential tool in achieving timely de-carbonization. For it to work, however, safe and reliable sequestration methods, standards, and practices must be identified, implemented, and proven to ensure captured carbon stays where it's stored for a meaningful time.

Carbon storage in the Gulf may eventually serve a useful role in reducing emissions and in meeting net-zero objectives; *however*, there are three crucial, minimum conditions that must be acknowledged and addressed to ensure this practice is done responsibly,[1] and that it works for both the environment and society:

1. These technologies are utilized as only one of many possible tools for advancing de-carbonization and for cutting our heavy dependence on fossil fuels;
2. Environmental justice and equity considerations must be central to decision-making on projects, not only through thoughtful consultation and collaboration, but also through proactive actions and solutions directly aimed at mitigating disproportionate burdens; and
3. Policies, incentives, and regulatory programs must be designed to ensure the environmental integrity and safety of geologic storage projects in the ocean environment, including associated infrastructure and transport operations – minimizing the potential for leaks or other harms to the climate, marine ecosystems, and the economy.

In the absence of these conditions, carbon storage may fail to live up to its hoped-for promise. Currently, the U.S. has an opportunity to showcase global leadership on this complex issue if it can meet these conditions.

EDF's testimony today centers on one core component of the third condition – ensuring the environmental integrity of geologic carbon storage reservoirs in the Gulf. The technical issues surrounding this challenge are of particular and timely relevance, as is this hearing, as the Department of Interior (DOI) is actively considering a rulemaking on the issue.

[1] White House Council on Environmental Quality: Carbon Capture, Utilization, and Sequestration Guidance, 87 FR 8808 (proposed Feb. 16, 2022).

Geologic Sequestration of CO_2 and Environmental Integrity – The DOI Rulemaking

As directed by the recent Infrastructure Investment and Jobs Act (IIJA) amendments to the Outer Continental Shelf Lands Act (OSCLA), DOI is currently developing regulatory programs "for the purpose of long-term carbon sequestration" on the Outer Continental Shelf (OCS) through processes that "prevent the carbon dioxide from reaching the atmosphere."[2]

The agency has until November to do this. It will be no easy task.

Recent models suggest that as much as 75% of carbon dioxide captured via carbon capture systems including direct air capture, will likely be sequestered in geologic reservoirs.[3] Moreover, the Intergovernmental Panel on Climate Change (IPCC), in its 2005 Special Report on CCS, concluded that well-selected, designed, and managed geological storage sites will likely exceed 99% retention of sequestered gases over 1,000 years.[4] In its recent 2022 report, IPCC built on additional research and went a step further to simply state with "high confidence" that "[i]f the geological storage site is appropriately selected and managed, it is estimated that the CO^2 can be permanently isolated from the atmosphere."[5]

While the concept of site selection and management may seem straightforward, appropriately meeting these objectives is, in fact, immensely complex. Failure on this front can cause unexpected outcomes and compromise projects.[6] Geologic carbon storage projects can only serve a meaningful role in reducing emissions if – **and only if** – they are sited, designed, managed, and regulated in a manner that unequivocally and transparently ensures and demonstrates the long-term technical and environmental integrity of sequestration.

That is DOI's challenge.

Getting this right is paramount for U.S. leadership on emissions reduction and climate mitigation. A DOI rulemaking that does anything less than establish a leading global standard for the environmental and climate integrity of geologic sequestration offshore will not only increase

[2] H.R. 3684 § 40307(a)(4) and 43 U.S.C. § 1337(p)(1).
[3] The Environmental Defense Fund (2021). *Summary for Policymakers: Carbon Management in Net-Zero Energy Systems*. https://www.edf.org/sites/default/files/documents/CM%20Summary%20for%20Policymakers_FINAL.pdf.
[4] IPCC (2005): IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, p. 14. https://www.ipcc.ch/site/assets/uploads/2018/03/srccs_wholereport-1.pdf.
[5] IPCC (2022): Summary for Policymakers. In: *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, p. 37. doi: 10.1017/9781009157926.001.
[6] *See e.g.*, White, J., Chiaramonte, L., Ezzedine, S., et al. (2014). Geomechanical behavior of the reservoir and caprock system at the In Salah CO2 storage project. *PNAS* 111(24), 8784-8752. https://doi.org/10.1073/pnas.1316465111 (presenting a case study of the In Salah CO_2 storage project, suggesting that operational injection pressures fractured the reservoir and lower caprock, allowing for pressure and likely CO_2 to move into the caprock. Although overall storage integrity wasn't compromised, the project stopped injection. The authors and many others underscore the field experience as a core example of the importance of careful site selection and monitoring.)

the risk of failures that return carbon to the atmosphere and contaminate ecosystems, but it would also undermine and further weaken public faith in the validity and strength of the U.S.'s carbon sequestration capabilities and climate mitigation commitments, including the 45Q tax credit.

Finally, establishing a new regulatory program and implementing and enforcing that program comes with significant resource and human capital considerations. Agencies must not only have adequate staff and resources to complete reviews, but also the knowledge, expertise, and training to do their jobs effectively. This need has been made clear in EPA's experience onshore. It is vital that as DOI stands up this program, it has adequate resources and training – needs that could be met not only by funding, but also by more direct collaboration with other expert state and federal agencies. EDF supports the appropriation of necessary funds for this capacity building.

Marine Environments Offshore Must be Protected Just as Drinking Water Resources are Onshore

Onshore, geologic storage of CO_2 projects are regulated by EPA's Underground Injection Control (UIC) Class VI program[7] – an extensive regulation finalized by EPA in 2011 after years of technical analysis and stakeholder engagement. EPA's authority to adopt this rule derived from its responsibility to protect underground sources of drinking water (USDW), but the rule is fundamentally about secure storage of CO_2 and the prevention of disaster. Some may argue for minimal regulatory oversight offshore and a rollback of the advanced protections of Class VI due to the absence of USDWs and communities on the OCS, but this technicality does not equate to a lack of risk or a sound reason to reduce regulatory protections offshore. While the technical implementation of certain regulations and operational principles may require adaptation for the offshore environment, none of the below recommendations regarding secure storage are unique to the need to protect drinking water; rather, they are well-studied, foundational principles for ensuring *containment* in the intended reservoir.

A containment failure either from the reservoir, or in the transport or other handling of captured CO_2, would have likely implications not only with respect to a return to atmosphere and reversal of climate gains, but also for marine ecosystems and water column chemistry. In-depth study and peer-reviewed literature on this issue is limited, reducing current understanding of the environmental and climate consequences of water column CO_2 releases. What *is* known raises enough concern to know that consequences of both slow leaks and catastrophic releases during transport or other operations should be taken seriously. For example, a catastrophic release of CO_2 directly into the ocean water column from a pipeline or ship — a hazard unique to geologic storage in the subseafloor — could temporarily acidify seawater to 100 times its natural levels, for tens of kilometers in all directions, with potentially dire consequences for fish and other components of marine ecosystems, including the industries and livelihoods that depend on those resources.[8]

[7] *Class VI – Wells used for Geologic Sequestration of Carbon Dioxide,* EPA.GOV, https://www.epa.gov/uic/class-vi-wells-used-geologic-sequestration-carbon-dioxide.

[8] *See, e.g.,* Siegel, D. A., DeVries, T., Doney, S. C., & Bell, T. (2021). Assessing the sequestration time scales of some ocean-based carbon dioxide reduction strategies. Environmental Research Letters, 16(10), 104003. https://doi.org/10.1088/1748-9326/ac0be0; Phelps, J. J. C., Blackford, J. C., Holt, J. T., & Polton, J. A. (2015). Modelling large-scale CO2 leakages in the North Sea. *International Journal of Greenhouse Gas Control,* 38, 210–220. https://doi.org/10.1016/j.ijggc.2014.10.013; Hofmann, G. E., Barry, J. P., Edmunds, P. J., Gates, R. D.,

The ocean environment itself comes with numerous additional and unique risk factors for geologic sequestration operations that are not present onshore. For example, while not covered by the scope of this testimony, in many cases, CO_2 will need to be safely transported through or upon the ocean by pipelines or ships before it can be injected, often at significant hydrostatic pressures that vary due to seabed depth. Indeed, comprehensive reviews[9] of scientific and policy concerns surrounding geologic storage have identified transport and initial injection as the phase of projects associated with greatest risk, underscoring further the need to cautiously address unique transport safety considerations in the ocean environment. Additionally, the 2020 Atlantic hurricane season brought a record-breaking eleven storms to the U.S. coastline, four of which came ashore in Louisiana alone.[10] The 2021 hurricane season was also above average.[11] It is predicted that a warming climate will result in more intense Atlantic hurricanes with higher rainfall rates.[12] This increasing risk[13] for industrial operations in the Gulf of Mexico must also be taken into consideration in establishing regulations regarding the infrastructure and operational requirements for carbon storage projects.

EDF strongly supports CEQ's recent recommendation that the Department of Energy, EPA, DOI, and National Oceanic and Atmospheric Association collaborate on studies "that are needed to better monitor and verify CCUS results and understand the impacts to living marine resources associated with geologic sequestration and monitoring efforts on the OCS."[14] In addition to this research and implementation of the below principles for secure storage, EDF also encourages these agencies to collaborate now on putting forth regulatory language that ensures proactive marine protections are in place in the currently active DOI rulemaking to the furthest extent of current scientific and technical knowledge. Work to understand and monitor these impacts cannot only occur long after DOI adopts and implements a leasing and permitting program. Where gaps exist, provisions requiring additional monitoring and study should be incorporated

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Hutchins, D. A., Klinger, T., & Sewell, M. A. (2010). The Effect of Ocean Acidification on Calcifying Organisms in Marine Ecosystems: An Organism-to-Ecosystem Perspective. Annual Review of Ecology, Evolution, and Systematics, 41(1), 127–147. https://doi.org/10.1146/annurev.ecolsys.110308.120227; Jones, D. G., Beaubien, S. E., Blackford, J. C., Foekema, E. M., Lions, J., De Vittor, C., et al. (2015). Developments since 2005 in understanding potential environmental impacts of CO2 leakage from geological storage. International Journal of Greenhouse Gas Control, 40, 350–377. https://doi.org/10.1016/j.ijggc.2015.05.032; Rastelli, E., Corinaldesi, C., Dell'Anno, A., Amaro, T., Greco, S., Lo Martire, M., et al. (2016). CO2 leakage from carbon dioxide capture and storage (CCS) systems affects organic matter cycling in surface marine sediments. Marine Environmental Research, 122, 158–168. https://doi.org/10.1016/j.marenvres.2016.10.007; and Molari, M., Guilini, K., Lott, C., Weber, M., de Beer, D., Meyer, S., et al. (2018). CO2 leakage alters biogeochemical and ecological functions of submarine sands. Science Advances, 4(2), eaao2040. https://doi.org/10.1126/sciadv.aao2040.

[9] *See, e.g.*, de Coninck, H., & Benson, S. M. (2014). Carbon dioxide capture and storage: Issues and prospects. *Annual Review of Environment and Resources*, 39(1), 243–270. https://doi.org/10.1146/annurev-environ-032112-095222.

[10] U.S. National Oceanic and Atmospheric Administration (2020). *Record-breaking Atlantic hurricane season draws to an end*. https://www.noaa.gov/media-release/record-breaking-atlantic-hurricane-season-draws-to-end.

[11] U.S. National Oceanic and Atmospheric Administration (2020). *Active 2021 Atlantic hurricane season officially ends*. https://www.noaa.gov/news-release/active-2021-atlantic-hurricane-season-officially-ends.

[12] Tom Knutson, Geophysical Fluid Dynamics Laboratory (2021). *Global Warming and Hurricanes: An Overview of Current Research Results*. https://www.gfdl.noaa.gov/global-warming-and-hurricanes/.

[13] Marianna Parraga, *Explainer: Stronger storms test aging U.S. offshore oil facilities*, REUTERS, https://www.reuters.com/business/energy/stronger-storms-test-aging-us-offshore-oil-facilities-2021-09-07/.

[14] White House Council on Environmental Quality: Carbon Capture, Utilization, and Sequestration Guidance, 87 FR 8808 (proposed Feb. 16, 2022).

into the regulatory and permitting program, alongside a process for modifying permit conditions as new, actionable information about risks and risk control options arise.

EDF scientists are actively reviewing and synthesizing existing knowledge surrounding the possible ocean environment consequences that may arise from subseafloor geologic storage, and we look forward to the opportunity to share our findings on an ongoing basis.

Collaboratively Developed Proposed Principles for Demonstrating Secure Storage

Secure storage in the offshore environment demands a precautionary approach. The remainder of this testimony focuses on a set of technical principles EDF believes are vital to ensuring that injected carbon stays where it is put for a meaningful period of time – a thousand years or more. In fact, "long-term carbon sequestration" is now a statutory requirement for offshore geologic carbon storage projects.[15] Proof of this outcome is vital not only for prevention of atmospheric releases and public trust in carbon storage projects, but also for the protection of marine ecosystems, water column chemistry, and other unique environmental, ecological, and biogeochemical features that could be affected by a potential release of stored or transported CO_2 into seawater. The below principles are core to demonstrating the security of storage and reducing the likelihood of leakage and other impacts from subsurface reservoirs.

EDF developed these principles in consultation with leading industry, academic, policy and legal experts. The principles build on existing domestic and international regulations, standards, and guidelines designed to ensure and require documentation for safe, long-term containment of CO_2.[16] Where applicable, specific sections of these references are included as footnotes and can be consulted for both technical analysis as well as exemplary regulatory language.

EDF believes that Congress can and should monitor the development of the offshore storage regulatory program to ensure that each of these issues is addressed in DOI's active rulemaking. Recognizing the technical nature of these principles, we would welcome an opportunity to provide further briefing, and our experts would be happy to work with Members as you analyze and assess the forthcoming DOI proposal or relevant legislative issues.

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[15] H.R. 3684 § 40307(a)(4) and 43 U.S.C. § 1337(p)(1).

[16] References cited include: (1) EPA's Underground Injection Control Program for Carbon Dioxide Geologic Sequestration [hereinafter Class VI Rule], 40 C.F.R. pt. 146; (2) International Organization for Standardization (2017). *Carbon dioxide capture, transportation and geological storage—Geological storage* [hereinafter ISO Standard No. 7914:2017], *available at* https://www.iso.org/standard/64148.html; (3) International Organization for Standardization (2019). *Carbon dioxide capture, transportation and geological storage—Carbon dioxide storage using enhanced oil recovery (CO2-EOR)* [hereinafter ISO Standard No. 27916:2019], *available at* https://www.iso.org/standard/65937.html (relevant as an approved means for demonstrating secure storage to the Internal Revenue Service (IRS) for Section 45Q (86 FR 4728); (4) The European Parliament and the Council of the European Union (2009). *Directive 2009/31/EC of the European Parliament and of the Council of the European Union on the geologic storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006*. [hereinafter EU Directive], *available at* https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0031; (5) U.S. Internal Revenue Service (2009), Notice 2009-83: *Credit for Carbon Dioxide Sequestration under Section 45Q*. https://www.irs.gov/pub/irs-drop/n-09-83.pdf.

EDF's Recommended (and Abbreviated) Principles:[17]

- **Limit Carbon Dioxide Stream Contents:** Section 40307 of the Infrastructure Investment and Jobs Act requires that a carbon dioxide stream consist overwhelmingly of carbon dioxide. We recommend consulting EPA's Class VI definition of carbon dioxide stream for language that will make sure that any other substances included are incidental and not added for the purposes of disposal.[18]
- **Select and Characterize Good Sites:** Proper site selection and site characterization is a fundamental step toward containment assurance. It is needed to confirm that sites have sufficient storage capability and trapping means to enable long-term containment. At each site, characterization must include a robust identification of potential leakage pathways in order to enable a site-specific monitoring program and set the stage for an eventual determination of whether long-term storage can be achieved with high confidence.[19]
- **Select and Characterize Good Reservoirs**. Storage should only be allowed in reservoirs that have sufficient areal extent, thickness, porosity, and permeability to receive the total anticipated volume of the carbon dioxide stream and that also have a confining zone and other necessary containment means sufficient to prevent loss of CO_2 from the storage reservoir.[20]
- **Identify and Assess Leakage Pathways:** An area of review (AOR) should be delineated using computational modelling that accounts for the physical and chemical properties of the injected CO_2 stream and displaced formation fluids, and should be based initially on available site characterization, monitoring, and operational data. Regulatory requirements should provide for adjustment of the area as each project and its site's characteristics are better understood. Using these data, the modelling should project the lateral and vertical migration of carbon dioxide and formation fluids in the subsurface from the commencement of injection activities until long-term containment is demonstrated and closure requirements are otherwise met. Regulations should require the identification and formal risk assessment of potential leakage pathways associated with the AOR.[21]
- **Safely Construct and Operate Wells:** Construction and completion requirements should prevent the movement of fluids into or between unauthorized zones. Wells should be spaced to avoid unplanned pressure interference from other injection wells. Older wells should only be allowed to transition to geologic sequestration purposes if they were engineered and constructed to fully prevent the movement of fluids into or between any unauthorized zones. For operations, regulations should ensure that injection does not initiate new fractures or propagate existing fractures in the confining zone and that internal and external mechanical integrity is appropriately maintained. Documentation of well monitoring should be required in order to track whether appropriate pressures and

[17] A full, technical version of the principles has been submitted to the Department of Interior.
[18] Class VI Rule 40 CFR 146.81(d) & 146.90(a); ISO 27914: 2017 3.7; ISO 27916: 2019 3.7; EU Directive 2009/31/EC 12.1.
[19] Class VI Rule 40 CFR § 146.83 (a); IRS Notice 2009-83 5.02(b)(i)(A); ISO 27914: 2017 5.1; ISO 27916: 2019 5.2; EU Directive 2009/31/EC Art. 4, Annex I.
[20] Class VI Rule 40 CFR § 146.83 (a)(1) & (2); ISO 27914: 2017 5.4; ISO 27916: 2019 3.10, 5.2; EU Directive 2009/31/EC Art. 4.3, Annex I.
[21] Class VI Rule 40 CFR § 146.84; ISO 27914: 2017 3.3, 4.2.3, 6.1; ISO 27916: 2019 6.1.1, 6.1.2; IRS Notice 2009-8 3.02(b)(i)(B).

integrity are maintained. Operational requirements should include alarms, automatic down-hole shut-off systems, and procedures for rapid response in case of a shut-off.[22]

- **Require Comprehensive Testing and Monitoring Plans:** Permit applications should be supported by testing and monitoring plans based on formal risk assessments. They should be designed to detect potential unintended migration of CO_2 streams into unauthorized formations, the sea, or the atmosphere through potential leakage pathways. Monitoring should be risk-based and should adapt over time since monitoring needs will change during different phases of the project. Permitting staff should be equipped with tools and knowledge necessary to independently review and approve the monitoring plan and its amendments.[23]
- **Require Emergency and Remedial Response Plans**: Require an emergency and remedial response plan that is keyed both to deviations in project conformance and to monitoring network indications of leakage.[24]
- **Require and Define Post-Injection Site Care (PISC)**: Post-injection monitoring and modelling should continue as long as necessary to confirm that CO_2 plumes are behaving as predicted and gather enough data to ensure secure storage. This process should reinforce: (1) understanding of the subsurface geologic storage system as measured by agreement between model forecasts and measurements of static and dynamic filed data, and (2) ability of the system to contain CO_2 while remaining within acceptable, projected risk thresholds.[25]
- **Demonstrating and Verifying Secure Storage**. Containment assurance should include preventing leakage of CO_2 from the entire storage complex (both the storage reservoir and the containment seals), thereby preventing leakage to both the water column and the atmosphere. There must also be assurance that formation fluids capable of harming aquatic life do not enter the water column. Demonstration of secure storage should include both the absence of detectable leakage and sufficient documentation to demonstrate with high confidence that injected CO_2 and formation fluids will be safely contained long-term – it's EDF perspective that this should be at least 1000[26] years. Regulations should require review and verification of this demonstration.[27]
- **Plugging the Well:** Prior to closure, wells should be required to be plugged in accordance with an updated approved plugging plan.[28]
- **Closure:** Site closure (the end of normal post-injection monitoring) should be approved only after an operator provides modelling backed by high-quality data that demonstrates

[22] Citations for well construction: Class VI Rule 40 CFR § 146.86 (a); ISO 27914: 2017 Clause 7; ISO 27916: 2019 Clause 7; Citations for well operation: Class VI Rule 40 CFR § 146.88; ISO 27914: 2017 Clause 8; ISO 27916: 2019 Clause 6.
[23] Class VI Rule 40 CFR § 146.90; ISO 27914: 2017 8.5 & Clause 9; ISO 27916: 2019 Clause 6; EU Directive 2009/31/EC Article 13, Annex II 2.
[24] Class VI Rule 40 CFR § 146.94; ISO 27914: 2017 4.3.4, 4.5.3, 6.6(g), 8.3.5; ISO 27916: 2019 6.1.1(g).
[25] Class VI Rule 40 CFR 40 CFR § 146.93(a); ISO 27914: 2017 9.2.4; ISO 27916: 2019 Clause 10; EU Directive 2009/31/EC Article 17.
[26] IPCC (2005): IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, p. 14. https://www.ipcc.ch/site/assets/uploads/2018/03/srccs_wholereport-1.pdf.
[27] Class VI Rule 40 CFR § 146.84(c)(1) & (2); ISO 27914: 2017 6.5, 6.7.2.2, 9.1; ISO 27916: 2019 5.1, Clause 6, 10.4.
[28] Class VI Rule 40 CFR 40 CFR § 146.92; ISO 27914: 2017 9.2.4; ISO 27916: 2019 7.2.

long-term containment of CO_2 and provides assurance against migration of CO_2 or formation fluids to the sea or atmosphere. Closure authorizations should not relieve an operator from ongoing responsibility for leaks or other harms caused by an operator's failure to adhere to regulatory requirements or approved plans regarding construction, operation, or closure of the project.[29]

- **Financial Assurance:** Financial assurance requirements must be sufficient to cover updated estimated costs of emergency and remedial response, corrective action, well plugging, and post-injection site care and closure.[30]
- **Assure Safety:** Operations must be conducted in a safe manner to protect against harm or damage to life (including fish and other aquatic life), property, natural resources of the OCS (including any mineral deposits both in areas leased and not leased), the National security or defense, or the marine, coastal, or human environment. This includes protecting against potential harms resulting indirectly from CO_2 injection, such as the migration of CO_2 or subsurface brine to the sea floor that would harm sea life or lead to deleterious changes in water chemistry.[31]
- **Transparency and Reporting**: Ensure accountability for geologic sequestration claims and U.S. carbon accounting programs such as the Greenhouse Gas Reporting Program (GHGRP) by requiring public comment on completed applications and proposed permits and public reporting of both CO_2 volumes sequestered and associated documentation of their security. Further, it's EDF's belief that a plain reading of the EPA Greenhouse Gas Reporting Program (GHGRP) Subpart RR[32] makes clear that its provisions apply to all wells that inject a CO_2 stream for long-term containment in subsurface geologic formations, including offshore facilities that are not subject to the Safe Drinking Water Act. As such, reporting requirements as well as provisions regarding the proposal and review of Monitoring, Reporting, and Verification (MRV) plans should be applicable to geologic sequestration facilities authorized by DOI. EDF recommends that DOI and EPA coordinate in order to foster efficient compliance.

Conclusion

While carbon capture and geologic storage is a critically important building block in reducing emissions, it is not a silver-bullet climate solution. It is a complex, highly technical, costly, and challenging venture that if done correctly can help us address industrial emissions. But geologic carbon sequestration cannot be done successfully by *just* anyone or take place *anywhere*.

The Gulf of Mexico does potentially offer a unique geologic opportunity and capacity to store large volumes of captured CO_2. Whether it can be done successfully – in a way that respects coastal communities, protects marine resources, prevents leaks and releases, and earns public trust as a valid solution remains to be seen. Ensuring that the U.S. is committed to developing oversight programs that address the principles for secure storage included here would be a good start.

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[29] Class VI Rule 40 CFR 40 CFR § 146.93 (b)(2); ISO 27914: 2017 Clause 10; ISO 27916: 2019 Clause 10; EU Directive 2009/31/EC Article 18; Texas 81(R) HB 1796 § 382.508(a) (2009).
[30] Class VI Rule 40 CFR § 146.85(a); EU Directive 2009/31/EC Art. 9.9, Art. 19
[31] 30 CFR § 250.400.
[32] 40 CFR pt. 98.