

# CARBON CAPTURE AND RELEASE

*Oversight Failures in the  
Section 45Q Tax Credit  
for Enhanced Oil Recovery*

*Spring 2018*



CLEAN WATER ACTION | CLEAN WATER FUND

## Acknowledgements

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## Executive Summary

After decades of scientific analysis and international negotiations, reducing carbon emissions is now a global imperative. U.S. Congress, for its part, recognized the potential for carbon capture and storage (CCS) technology to reduce emissions and provided a tax incentive for companies that capture carbon dioxide (CO<sub>2</sub>) from various industrial practices and store it underground.

The new tax policy, codified under Section 45Q of the Internal Revenue Code, offered a tax credit per ton of carbon captured and sold to companies to inject underground for permanent storage or for use in enhanced oil recovery (EOR). The intent was to jump start a nascent technology that could eventually transform into a globally scalable option to reduce emissions. In January 2018, Congress extended the credit, broadened the qualifying industries and tripled the amount offered for CO<sub>2</sub> captured and sold to EOR companies.<sup>1</sup>

Injecting captured carbon underground to produce more oil is promoted as a climate mitigation policy. Purportedly, over time oil fields could sequester (permanently store CO<sub>2</sub> in geologic formations) large amounts of carbon and at the same time help bring down CCS technology costs. A popular notion is that the oil extracted and burned is less of a concern, as long as some carbon is permanently sequestered to help offset emissions elsewhere.<sup>2</sup> The oil industry benefits from the enthusiasm for CCS because its growth strategy leans heavily on injecting CO<sub>2</sub> to increase production. The industry plans to use CO<sub>2</sub>-EOR to unlock billions of barrels of oil trapped in vast residual oil zones. A consistent supply of cheap CO<sub>2</sub> improves the extraction economics for resources that would otherwise likely remain in the ground.

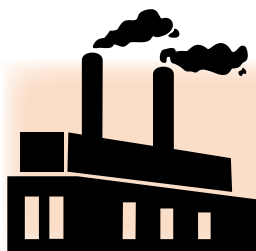
In order to qualify for the tax credit under Section 45Q, a company must verify and report to the Envi-

ronmental Protection Agency (EPA) that the carbon injected remains safely underground. Research into the tax credit reveals an alarming lack of oversight. EPA has no record of the vast majority of CO<sub>2</sub> claimed under the credit. It appears some companies that benefited from the tax credit ignored monitoring and reporting requirements and continued to access the credit to their financial advantage. This report exposes these oversight failures and challenges the assertion that federal subsidies for carbon used in enhanced oil recovery could ever be considered an effective climate mitigation policy. Among the findings:

- **59,767,924:** metric tons of CO<sub>2</sub> claimed to IRS as captured for tax credit as of May 14, 2018.
- **3 million:** metric tons of CO<sub>2</sub> reported to EPA for sequestration verification as of August 5, 2017.
- **\$597 million up to \$1.3 billion:** value of claimed credits.
- **85%–90%:** percentage of projects under the new tax credit that will be used to extract oil according to the International Energy Agency (IEA). Only 10%–15% would result in permanent sequestration of CO<sub>2</sub>.
- **375 million barrels:** increase in oil production annually by 2030 as a result of carbon capture technology and infrastructure deployment.

The discrepancy between the IRS and EPA data suggests that only a small portion of the required reporting to EPA to ensure that the carbon is verifiably and permanently stored underground is occurring.

Verification that CO<sub>2</sub> is actually sequestered is critical to demonstrating the effectiveness of CCS as an



*The oil industry's growth strategy leans heavily on injecting CO<sub>2</sub> to improve production.*

emissions reduction technology. Ensuring *secure geological storage* is a large part of the bipartisan support for the tax credit. Proponents want to incentivize sequestration, not merely injection for oil extraction. The tax policy is designed so that EOR operations have to confirm by monitoring, reporting and verifying that these projects provide the intended carbon storage benefit. This did not happen.

Ignoring compliance provided industry an unearned advantage in the marketplace. If it is not remedied the increase in tax credits will only exacerbate oversight issues and undermine the competitiveness of zero carbon alternatives. Instead, a small group of oil companies are attempting to further weaken the tax credit requirements. Legislation supported by Exxon Mobil and Denbury Resources sought to change what is considered secure geological storage. So far these attempts have not been successful, but there have been ongoing efforts to weaken the 45Q requirements even after the tax credit was increased. This undercuts the largely good-faith efforts to develop sound CCS policy.

In light of the credit extension, lawmakers should grant Section 45Q additional scrutiny, provide

resources necessary to hold bad actors accountable, and restore public trust in the process of geologic sequestration. The relatively small universe of companies that capture carbon combined with the limited number of companies that injected carbon to enhance oil recovery from 2011–2018 should make it easy for regulators to identify those who are skirting the rules.<sup>3</sup>

Until the tax credit oversight is reformed, Congress should:

- Enact a moratorium on all Section 45Q tax credits for CO<sub>2</sub> used in enhanced oil recovery.
- Ensure projects out of compliance since 2011 submit a Monitoring Reporting and Verification plan to EPA or halt injection.
- The Senate Finance and Environment and Public Works Committees should hold hearings on past and future oversight of 45Q.
- Begin a stakeholder process to create a credible regulatory framework for CO<sub>2</sub>-EOR designed to reflect the unique risks associated with the injection of carbon and to ensure geologic sequestration.

## Oversight of CO<sub>2</sub> Injection

When Congress passed the Safe Drinking Water Act (SDWA) in 1974, it authorized the U.S. Environmental Protection Agency (EPA) to develop a program to protect underground drinking water resources from risks of industrial activities in which fluids are injected into the ground. In order to ensure continued access to safe drinking water from groundwater sources, SDWA prohibits injection that endangers any underground source of drinking water (USDW).

EPA's Underground Injection Control (UIC) program classifies wells into six categories based on the type

of injection activity. Class II regulates three aspects of oil and gas activity: injection for enhanced oil recovery, disposal of wastewater from oil and gas activities and storage of hydrocarbons. In 2010, EPA added a new category of wells — Class VI — for permanent storage. Each well class has a set of permit requirements.

Most oil and gas producing states receive primary management and enforcement authority over their own state UIC programs. This “primacy” allows states to regulate most oil and gas injection activity



*Ignoring compliance provided industry an unearned advantage in the marketplace.*



after demonstrating to EPA that their Class II regulations protect USDWs. State primacy over Class VI wells is still in the early stages of adoption.<sup>4</sup>

The broad list of requirements for Class II EOR wells includes:<sup>5</sup>

- Site characterization: identifying faults and fractures and a confining zone
- Area of review: operator must design a proper area of review and identify any wells and geologic features that may penetrate the area of injection
- Well construction: requirements designed to prevent fluids or CO<sub>2</sub> migration into USDWs

The UIC Class II regulations were originally designed to prevent migration of fluids into USDWs. The regulations did not address unique airside risks related to CO<sub>2</sub> leakage, verification of permanent storage or reporting monitoring information to EPA. More acute concern about greenhouse gas emissions eventually drove policies to address these risks.

On November 22, 2010, EPA finalized Greenhouse Gas Reporting Rule for Geologic Sequestration and Injection of Carbon Dioxide.<sup>6</sup> The regulation provided two distinct reporting mechanisms for facilities injecting CO<sub>2</sub> underground. The first, filed under Subpart UU, is for companies that inject CO<sub>2</sub> for purposes of enhancing oil recovery. Operators only have to report basic information on CO<sub>2</sub> received onsite for injection.

Operators injecting CO<sub>2</sub> underground for permanent storage in geologic formations report under Subpart RR and are required to provide more rigorous oversight of the CO<sub>2</sub> injection process. Facilities are required to:

- Report basic information on CO<sub>2</sub> received for injection.
- Develop and implement a site specific monitoring, reporting, and verification (MRV) plan.
- Report the amount of CO<sub>2</sub> geologically sequestered using a mass balance approach and annual monitoring procedures.<sup>7</sup>

MRV plans are a key aspect of the regulation. This is

to help ensure CO<sub>2</sub> leaks are detected and fixed and that the carbon remains permanently underground. The major elements of MRV plans include:

- Identification of potential surface leakage pathways for CO<sub>2</sub>.
- Delineation of the maximum monitoring area and active monitoring areas.
- A strategy for detecting and quantifying any surface leakage of CO<sub>2</sub>.
- A strategy for establishing the expected baselines for monitoring CO<sub>2</sub> surface leakage.
- A summary of how the facility will calculate site-specific variables for the mass balance equation, such as considerations for calculating equipment leakage and vented emissions between flow meters and wells, and considerations for calculating CO<sub>2</sub> in produced fluids.

Appendix A includes EPA's suggested outline for MRV reports. It demonstrates the high level of detail and monitoring sophistication required for each project. The MRV process also includes an opportunity for the general public to appeal EPA's final project approval decision.<sup>8</sup>

EPA emphasized the importance of reporting and verification beyond simply identifying leaks: **“Subpart RR information will enable EPA to monitor the growth and efficacy of geologic sequestration (and therefore CCS) as a GHG mitigation technology over time and to evaluate relevant policy options.”**<sup>9</sup> All facilities that fall under Subpart RR were required to start reporting CO<sub>2</sub> information starting in 2011.

These requirements, together with the Safe Drinking Water Act Underground Injection Control regulations, are intended to ensure CO<sub>2</sub> injected would not contaminate a drinking water source or escape into the atmosphere.

Note that even these existing regulations are inadequate to fully protect USDWs, stop CO<sub>2</sub> leakage or offer effective methods to intervene against bad actors. Importantly, Subpart RR lacks preventive mechanisms beyond reporting that are necessary

for more comprehensive protection from CO<sub>2</sub> leakage. In order to achieve the policy goal of large-scale carbon sequestration in oil fields; the regulations

must be updated to fill gaps in protection and reflect the increased risks associated with CO<sub>2</sub> injection activity.<sup>10</sup>

## Oversight Matters: No Sequestration Without Verification

Continuous high pressure CO<sub>2</sub> injection presents significant risks to the environment. This includes groundwater contamination and CO<sub>2</sub> leaks to the atmosphere that would further drive long term changes to the climate. The process often utilizes other fluids in addition to CO<sub>2</sub>, including polymers and oil and gas produced water containing harmful chemicals. [See Appendix B].

In normal EOR operations, CO<sub>2</sub> leaks onsite at a facility are not reflected in the project accounting.<sup>11</sup> A white paper commissioned for the MIT Energy Initiative Symposium on the *Role of Enhanced Oil Recovery in Accelerating the Deployment of Carbon Capture and Sequestration* outlined a number of reasons why EOR wells and existing oil fields may not always be a suitable location to inject CO<sub>2</sub> for permanent sequestration. The concerns include problems related to geologic conditions and well integrity issues.<sup>12</sup>

- Seals that have retained oil and gas in the past but might not have the same capacity to contain CO<sub>2</sub>
- Improperly constructed and plugged wells
- Seals that have been damaged by secondary or tertiary injections of fluids at high pressure

- Seals that are at risk of being damaged by current or future injection operations because there is very little “headroom” between the field’s miscibility pressure and the pressure that would cause the seal to experience shear failure or tensile failure
- Seals that have been compromised as a result of reducing reservoir pressure during previous production operations
- Lateral spill-points from which CO<sub>2</sub> could escape if the reservoir is filled beyond its appropriate capacity
- Hydrogeologic conditions posing a significant risk that injection could cause formation fluids to migrate into drinking water supplies.”

These are situations that demonstrate that regulations are necessary to ensure injected carbon remains safely underground. IRS and EPA agreed on the basic principles that there is a difference between injection and sequestration and that sequestration is not “sequestration” without verification.<sup>13</sup> The next section describes a series of events that demonstrate why monitoring, reporting and verification requirements were attached to the Section 45Q tax credit.

## Section 45Q Tax Credit Requirements

In 2009, IRS amended Section 45Q to include monitoring and oversight provisions to ensure that CO<sub>2</sub> captured and sold to enhanced oil recovery companies would not escape into the atmosphere. The

IRS endorsed the underlying logic that companies should prove that captured carbon is permanently sequestered underground if they want to receive the credit.



*Existing regulations are inadequate to fully protect USDWs, stop CO<sub>2</sub> leakage or offer effective methods to intervene against bad actors.*

The monitoring details for what is considered *secure geological storage*, a condition required by statute,<sup>14</sup> are described in IRS and EPA documents. IRS issued guidance for operators in November 2009. It outlined in clear language that: “In order to qualify for the § 45Q credit, a taxpayer must either **physically or contractually** dispose of captured CO<sub>2</sub> in **secure geological storage** using adequate security measures as provided by the Secretary in regulations.”<sup>15</sup>

At the time there were no regulations describing how to determine if carbon was permanently sequestered. EPA was in the process of developing requirements for CO<sub>2</sub> geologic sequestration under the Greenhouse Gas Reporting Rule.

IRS understood this and accounted for the lag in regulations by issuing “interim procedures” which defined secure geological storage.

It stated that taxpayers [companies] “must conduct” the procedures outlined originally in the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouses Gas Inventories. Procedural details included:<sup>16</sup>

- “Characterization of the storage site geology to identify faults, fractures and other leakage pathways.
- Conduct an assessment of potential leaks of CO<sub>2</sub> from the storage site using models that predict CO<sub>2</sub> movement over time etc.
- Monitor leakage pathways and current and future behavior of the CO<sub>2</sub> in accordance with a monitoring plan.”

IRS was clear that the interim procedures described above were required to demonstrate secure geological storage for the purposes of the 45Q credit until EPA regulations were finalized:

“When the proposed geologic sequestration rules are finalized, such rules (or any successor rules) will apply in addition to the final UIC program rules (to the extent applicable), and the requirements of the IPCC Guidelines under paragraph (i) will no longer apply.”<sup>17</sup>

These IRS procedures, informed by the IPCC guidelines, were the basis of EPA’s final Subpart RR report-

ing requirements and what is considered *secure geological storage*.

**After November 2010, in order to qualify for the 45Q tax credit, operators had to “opt in” and agree to the monitoring and reporting requirements under Subpart RR.** This included submitting a project MRV plan to EPA for final approval.

IRS released an updated Oil & Gas Industry Handbook in 2013 which reaffirmed these requirements. For added clarity the Handbook is quoted at length (emphasis added):

1. “IRC 45Q and Notice 2009-83 state that a taxpayer claiming the credit must comply with evolving rules of the U.S. Environmental Protection Agency (EPA) regarding the sequestration of CO<sub>2</sub> and reporting of CO<sub>2</sub> volumes measured at the source of capture and verified at the point of disposal or injection.
2. EPA promulgated final rules regarding the reporting of both CO<sub>2</sub> emissions and CO<sub>2</sub> use (including sequestration) for years after 2010. Subpart RR – Geologic Sequestration of Carbon Dioxide is applicable to the IRC 45Q credit.
3. The Preamble to **EPA’s final rule states that, under the final rule, operators of facilities that are sequestering CO<sub>2</sub> in geologic storage must comply with Subpart RR regardless of whether the CO<sub>2</sub> is currently used as a tertiary injectant in an EOR project.** EPA’s preamble also states that taxpayers claiming the 45Q tax credit after 2010 must follow Subpart RR’s “MRV procedures”. MRV stands for Monitor, Report and Verify. The MRV procedures require the operator to submit an MRV plan to the EPA for its approval, and to annually report CO<sub>2</sub> volumes, including amounts sequestered, pursuant to the plan. Examiners should obtain a copy of these documents.”<sup>18</sup>

This is the oversight decision chain that should have been followed for all 45Q credits, but often was not. [\[See Figure 1\].](#)

The tax credit procedures are also clear about which

entity is ultimately responsible for secure geological storage of the captured and injected carbon.

According to IRS, taxpayers who claim the credit must:

“(iii) **physically or contractually ensure that the qualified CO<sub>2</sub> is securely stored in a geologic formation**, including where such CO<sub>2</sub> is captured and

transported for use in an EOR project. In the case of qualified CO<sub>2</sub> that is used as a tertiary injectant in an EOR project, requirement (iii) above applies only to CO<sub>2</sub> captured after February 17, 2009.”<sup>19</sup>

It is unclear why this requirement was largely ignored starting in 2011 through the time of this writing in May 2018.

## Oversight Failures and the Unknown

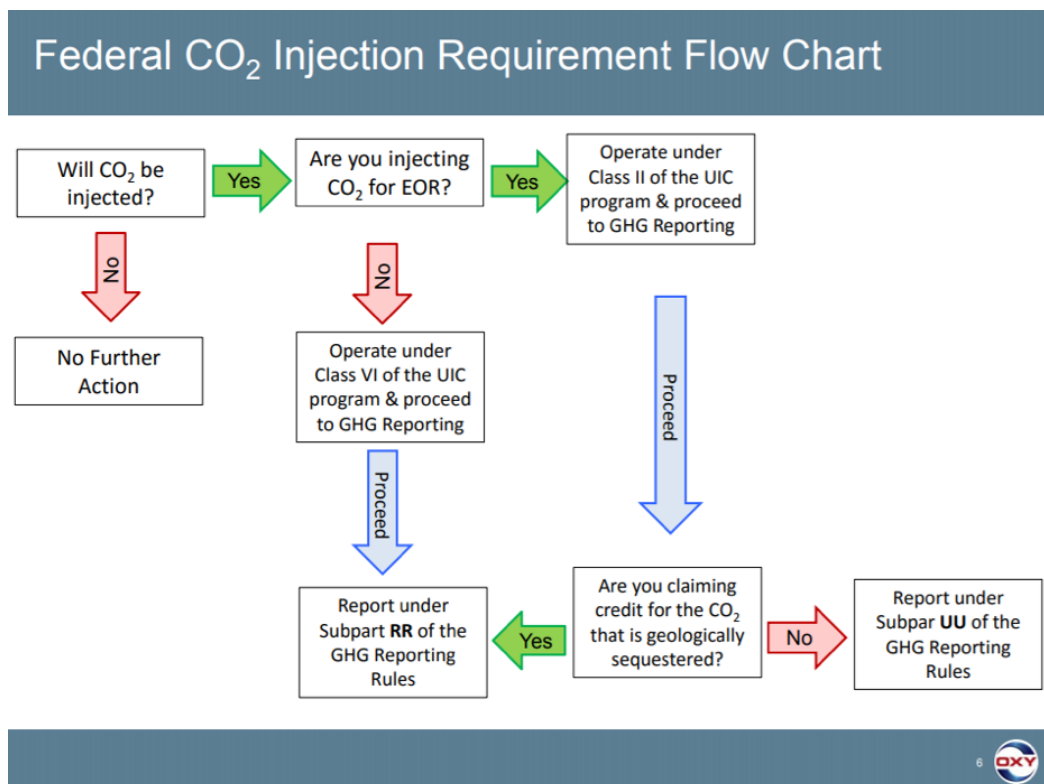
The latest update from IRS reported that **59,767,924 metric tons** of CO<sub>2</sub> were claimed under 45Q as of May 14, 2018.<sup>20</sup> The claimed credits are valued between \$597 million and \$1.3 billion.<sup>21</sup>

EPA’s Greenhouse Gas Reporting Database, however, reports only **3 million metric tons** of sequestered carbon.<sup>22</sup> The tax requirements are clear that the amount of carbon captured and sold should be similar to the amount reported as sequestered. Companies must submit MRV plans to EPA as part of the verification process to ensure the injected

carbon is permanently sequestered.

Senior Counsel in EPA’s Office of Air and Radiation published a blog on May 22, 2016 titled “*An Important Milestone for Secure Carbon Dioxide Storage*”. The milestone in question was the first MRV plan officially submitted to EPA. Occidental Permian, Ltd., a subsidiary of Occidental Petroleum Corporation, complied with the 45Q credit requirements and EPA’s Greenhouse Gas Reporting Rule under Subpart RR for its EOR facility located in Texas.<sup>23</sup> Occidental indicated that one of its reasons for submitting an

Figure 1: Presentation slide from Daniel Kim, Commercial Development Analyst, Occidental Petroleum Corporation. May 24, 2017.





MRV plan was to “enable carbon capturers to qualify for and receive 45Q tax credit.”<sup>24</sup>

**According to the IRS, this means that millions of metric tons of carbon had already been claimed for a tax windfall before the first MRV plan was approved in 2016.** Somewhere along the chain of carbon capture companies and EOR companies, certain oversight procedures were ignored. IRS specifi-

cally noted that in order to verify that CO<sub>2</sub> injected to produce more oil actually provided the benefit of permanently sequestering carbon; operators would have to agree to elevated oversight requirements in Subpart RR. As of May 2018, there are only three final MRV plans posted on EPA’s website — two Occidental Petroleum projects and one for Archer Daniels Midland Company.<sup>25</sup>

## Who Benefits from Section 45Q?

The Global CCS Institute database includes 8 large scale projects online as of 2017 which likely could have qualified for 45Q. These are the suppliers of captured CO<sub>2</sub>. In terms of companies that inject CO<sub>2</sub> underground, EPA’s GHG database shows a stark contrast in the reporting from Subpart UU to Subpart RR. It is still unclear which companies reporting under UU benefited from the 45Q tax credit but neglected to report under the required Subpart RR. Reporting data for Subpart RR before 2016 is nonexistent. Both databases and CO<sub>2</sub> suppliers are included in [Appendix C](#).

The largest commercial carbon capture facility in the world is ExxonMobil’s Shute Creek natural gas processing plant in LaBarge, Wyoming.<sup>26</sup> Exxon captures up to 7 million metric tons of carbon annually and sends it through Exxon, Chevron and Anadarko pipeline systems to EOR operators in Wyoming and Colorado.<sup>27</sup>

Exxon is one of the largest suppliers of CO<sub>2</sub> to EOR operations and describes itself as on the “cutting edge” of CCS and EOR techniques with marketing comments like:

“Through its investment in EOR projects today, ExxonMobil will continue to gain knowledge of safe CO<sub>2</sub> storage techniques — the cornerstone of a commercially viable, successful CCS program.”<sup>28</sup>

Yet, the company also supports federal legislation that would deregulate the tax code and undermine the effectiveness and credibility of geologic sequestration.

The CO<sub>2</sub> Regulatory Certainty Act, introduced by Senator John Hoeven (R-ND), is specifically written for companies that benefit from 45Q tax credits.<sup>29</sup> This proposed law would allow EOR operators to claim “secure geological storage” by only reporting the amount of CO<sub>2</sub> piped to facility under Subpart UU instead of the more protective Subpart RR as currently required. This undermines the intention of the tax credit, which is designed to ensure carbon is permanently sequestered underground.

Reports required under the Lobbying Disclosure Act indicate Exxon was one of two companies that lobbied in support of the legislation [[See Appendix D](#)]. This supports the perception that Exxon is interested in creating a large-scale CO<sub>2</sub>-EOR market and maintaining its dominant supplier position.<sup>30</sup> It also supports the perception that Exxon wants to weaken requirements, possibly as a way to keep costs down.

Denbury Resources, a smaller operator that specializes in EOR and purchases carbon from Exxon, also supported the bill. Denbury currently holds a one third ownership stake in the carbon from Exxon’s



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Shute Creek facility and receives 63 million metric feet per day.<sup>31</sup>

In public presentations Denbury called 45Q “problematic” and the requirements “unworkable” while insisting Subpart RR transformed EOR into a waste disposal operation.<sup>32</sup> The company said Subpart RR precluded access to reserves at the conclusion of EOR operations and that overall the tax credit was “not usable in EOR unless amended.”<sup>33</sup> Occidental’s compliance under Subpart RR with approved MRV plans, however, undercuts Denbury’s concerns that the current level of oversight is “unworkable.”

If Exxon, for example, was the company accruing tax credits for capturing carbon and then selling it to

EOR companies like Denbury, IRS is clear that Exxon would need to certify in the contractual agreement that the buyer would ensure the carbon was sequestered in “secure geological storage” and be able to document compliance with the requirements.<sup>34</sup> This requires that the company injecting CO<sub>2</sub> submit an MRV plan to EPA.

Noncompliance with CO<sub>2</sub> injection monitoring, reporting, and verification undercuts the integrity of 45Q. It should be easy, however, for regulatory enforcement officials to retroactively determine which companies were flaunting oversight requirements and receiving unwarranted taxpayers dollars from 2011–2018.

## Industry Growth Strategy Leans Heavily on CO<sub>2</sub>-EOR

Increasing oil production with CO<sub>2</sub>-EOR will play a key role in the industry’s growth strategy. Beyond hydraulic fracturing and conventional extraction technologies, CO<sub>2</sub>-EOR applied to unconventional resources is already being marketed as the “next frontier.”<sup>35</sup>

According to DOE, EOR technologies can access 30 to 60 percent of the oil trapped in a reservoir compared to the 10 percent usually developed through conventional means.<sup>36</sup> New innovations applied to CO<sub>2</sub>-EOR in the U.S. could enable the technology to produce 60 billion barrels of oil in the coming years.<sup>37</sup> Yet in the absence of consistent low cost supplies of anthropogenic CO<sub>2</sub>, the future of the CO<sub>2</sub>-EOR industry is less clear. IEA determined that one of the drivers of new 45Q legislation was to “unlock demand that is currently limited by the constraints on natural CO<sub>2</sub>.”<sup>38</sup> In the Permian Basin, analysts already determined that the oil industry’s demand

for CO<sub>2</sub> outstripped supply in 2004.<sup>39</sup>

Now, Denbury predicts CO<sub>2</sub>-EOR can unlock 10.3–23.4 billion barrels of recoverable oil in Texas alone.<sup>40</sup>

DOE cited a current project in which CO<sub>2</sub> injection could “add another 25 years and as much as 130 million barrels of oil that might otherwise have been abandoned.”<sup>41</sup>

Recent DOE funded research demonstrated that CO<sub>2</sub>-EOR applied to residual oil zones (ROZs) could potentially unlock billions of barrels of oil in the Permian Basin. Researchers called access to ROZs “just the tip of the iceberg” and that the Permian Basin could hold “800 billion, perhaps 1 trillion, barrels of oil” due to this new technological advancement.<sup>42</sup>

Occidental Petroleum’s President announced that access to ROZs “underlies most of our major EOR properties and can be developed between \$3 and



*CO<sub>2</sub>-EOR proponents maintain that a large scale CO<sub>2</sub> pipeline build-out in conjunction with federal incentives like 45Q could triple the size of the industry and increase production by 375 million barrels annually by 2030.*

\$7 a barrel.”<sup>43</sup> Occidental also noted that it is piloting projects that apply CO<sub>2</sub>-EOR to unconventional resources, intended to eventually “offset the natural decline of the shales.”<sup>44</sup>

Lastly, CO<sub>2</sub>-EOR proponents maintain that a large scale CO<sub>2</sub> pipeline build out in conjunction with federal incentives like 45Q could triple the size of the industry and increase production by 375 million barrels annually by 2030.<sup>45</sup>

The future of the oil industry leans heavily on inject-

ing CO<sub>2</sub> underground. But it is unclear whether the carbon actually remains underground and does not escape into the atmosphere. A growing political interest group is coalescing around expanding the CCS and EOR connection without the necessary oversight in place. Senator Hoeven, with help from allied interests, continues to push to deregulate 45Q in order to expand CO<sub>2</sub>-EOR as quickly as possible.<sup>46</sup> Fortunately, Congress and federal agencies have the power to course correct and align the tax credit with the original policy goals.

## **Increase Oversight of 45Q: Hold Bad Actors Accountable and Restore Public Trust**

Even with 45Q regulations in place, companies did not follow the rules. IRS reports 59 million metric tons of carbon have been claimed, worth upwards of a billion dollars, and EPA only has a record of 3 million metric tons recorded as sequestered in secure geological storage. These numbers should be roughly similar. In 2013, IRS reaffirmed the EPA requirements embedded in the tax code. This should have been a warning to operators to submit previously disregarded MRV requirements but the abuse continued. According to the IRS, between 2014 and 2018, 34 million more metric tons were claimed and the vast majority not reported to EPA.<sup>47</sup>

Ignoring compliance provided industry an unearned advantage in the marketplace. If it is not remedied the increase in tax credits will only exacerbate oversight issues and undermine the competitiveness of zero carbon alternatives. Oil companies,

likely the same group that has claimed the credit in the past, are projected to reap the majority of the tax benefits from the recently updated version of 45Q. IEA predicts 85% to 90% of the projects resulting from the extended credit will be used to extract oil, potentially leaving only 10% to 15% for permanent sequestration projects that inject into saline formations.<sup>48</sup>

In the wake of the credit extension in 2018, lawmakers should grant 45Q heightened attention and provide vigilance and resources to hold bad actors accountable and restore public trust to the process of geologic sequestration.

In order to reestablish oversight of 45Q and ensure taxpayer subsidized carbon capturers and their partner EOR operators can prove secure geological storage in line with EPA regulations, Congress should:

- Enact a moratorium on all Section 45Q tax credits for CO<sub>2</sub> used in enhanced oil recovery.
- Ensure projects out of compliance since 2011 submit an MRV plan to EPA or halt injection.
- Senate Finance and Environment and Public Works Committees should hold hearings on past and future oversight of 45Q.
- Begin stakeholder process to create a credible regulatory framework for CO<sub>2</sub>-EOR, designed to reflect the unique risks associated with geologic sequestration.

## Notes

- 1 H.R.1892 – Bipartisan Budget Act of 2018, <https://www.congress.gov/bill/115th-congress/house-bill/1892/text>.
- 2 This idea is featured prominently by National Enhanced Oil Recovery Initiative (now renamed as Carbon Capture Coalition) in its presidential transition memos to both parties: “Captured CO<sub>2</sub> is used commercially in the U.S. to recover more oil from already developed oil fields. That CO<sub>2</sub> is then safely and permanently stored underground in those same oil and gas reservoirs” [https://www.eenews.net/assets/2016/11/02/document\\_gw\\_07.pdf](https://www.eenews.net/assets/2016/11/02/document_gw_07.pdf)
- 3 EPA indicated GHG reporting was required for carbon received starting in 2011. <https://www.epa.gov/sites/production/files/2015-07/documents/subpart-rr-uu-ppt.pdf>
- 4 EPA, “EPA Approves First Underground Injection Control Program Primacy for Carbon Sequestration Wells in North Dakota,” April 10, 2018, <https://www.epa.gov/newsreleases/epa-approves-first-underground-injection-control-program-primacy-carbon-sequestration>.
- 5 Natural Resource Defense Council, “Strengthening the Regulation of Enhanced Oil Recovery to Align it with the Objectives of Geologic Carbon Dioxide Sequestration,” 2017, p 6, <https://www.nrdc.org/sites/default/files/regulation-eor-carbon-dioxide-sequestration-report.pdf>.
- 6 EPA, “Frequently Asked Questions for Geologic Sequestration and Injection of Carbon Dioxide: Subparts RR and UU,” 2010, <https://www.epa.gov/sites/production/files/2015-07/documents/subpart-rr-uu-faq.pdf>.
- 7 EPA, “Final Greenhouse Gas Reporting Rule for Geologic Sequestration and Injection of Carbon Dioxide: Subparts RR and UU,” <https://www.epa.gov/sites/production/files/2015-07/documents/subpart-rr-uu-ppt.pdf>.
- 8 EPA, “General Technical Support Document for Injection and Geologic sequestration of Carbon Dioxide; Subparts RR and UU Greenhouse Gas Reporting Program,” 2010, p 80, 93, [https://www.epa.gov/sites/production/files/2015-07/documents/subpart-rr-uu\\_tsd.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/subpart-rr-uu_tsd.pdf).
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# Appendix A

## EPA's Suggested Outline for MRV Plans

Source: U.S. EPA, Office of Air and Radiation, "General Technical Support Document for Injection and Geologic Sequestration of Carbon Dioxide: Subparts RR and UU – Greenhouse Gas Reporting Program," November 2010.

### 1) Facility Information

- i) Reporter number
- ii) UIC permit class
- iii) UIC injection well identification numbers
- iv) Authorization for CO<sub>2</sub> injection if an offshore well not subject to SDWA
- i) MRV plan identification number (for resubmittals)
- ii) Date most recent MRV plan approved by EPA (for resubmittals)
- iii) Reason for re-submittal (for resubmittals)

### 2) Project Description

- a) Project characteristics
  - i) Estimated years of CO<sub>2</sub> injection
  - ii) Estimated tons CO<sub>2</sub> received over lifetime of project
- b) Environmental Setting of the MMA
  - i) Surface and subsurface boundary of the MMA
  - ii) Geology and hydrogeology
  - iii) Historical use of subsurface and surface
  - iv) Available reference sites (near but outside project area for development or adjustments to baselines)
- c) Description of the Injection Process
  - i) Variability of CO<sub>2</sub> composition
  - ii) Number, location and depth of injection wells
  - iii) Compression/pumping, conditioning and pipelines at the facility
- d) Reservoir Characterization and Modeling
  - i) Simulation model(s) used
  - ii) Modeling objectives
  - iii) Modeling procedures
  - iv) Data inputs, sources, quality control, update process
  - v) Model outputs
  - vi) Grid size and resolution
  - vii) Model calibration process and sensitivity analysis

### 3) Delineation of the monitoring areas

- a) MMA
  - i) Determination of free phase plume extent
  - ii) Determination of buffer zone
- b) AMA(s)
  - i) Initial monitoring period, area and time frame
  - ii) Future monitoring periods, areas and time frames

### 4) Evaluation of Leakage Pathways

- a) Well pathway(s)
- b) Fractures, faults and bedding plan parting pathway(s)
- c) Confining system pathway(s)
- d) Other identified pathways(s)

## **Appendix A** *continued*

### *5) Detection, Verification and Quantification of Leakage*

- a) Leakage detection methods
  - i) Process for detecting leakage for each pathway
  - ii) Performance measures for leak detection
- b) Leakage Verification and Quantification Methods
  - i) Process for verifying and quantifying leakage for each pathway
  - ii) Performance measures for verifying and quantifying leakage

### *6) Determination of Expected Baselines*

- a) Monitoring method A expected baseline method
- b) Monitoring method B expected baseline method
- c) Monitoring method C expected baseline method

### *7) Site Specific Modifications to the Mass Balance Equation*

- a) Equipment leaks and vented emissions from surface equipment downstream of injection flow meter
- b) Equipment leaks and vented emissions from surface equipment downstream of production well flow meter (if applicable)
- c) CO<sub>2</sub> produced in oil and other fluids

### *8) Estimated Schedule for implementation of MRV plan*

- a) Timing for expected baseline determination
- b) Timing of implementation of leakage detection and quantification monitoring
- c) Proposed date to begin collecting data for calculating total amount sequestered according to equation RR-11 or RR-12 of this subpart.

### *9) Quality Assurance Program*

### *10) Records Retention*

### *11) Appendices*

## Appendix B

# Carbon Dioxide Enhanced Oil Recovery (CO<sub>2</sub>-EOR): A Threat to Drinking Water and the Environment

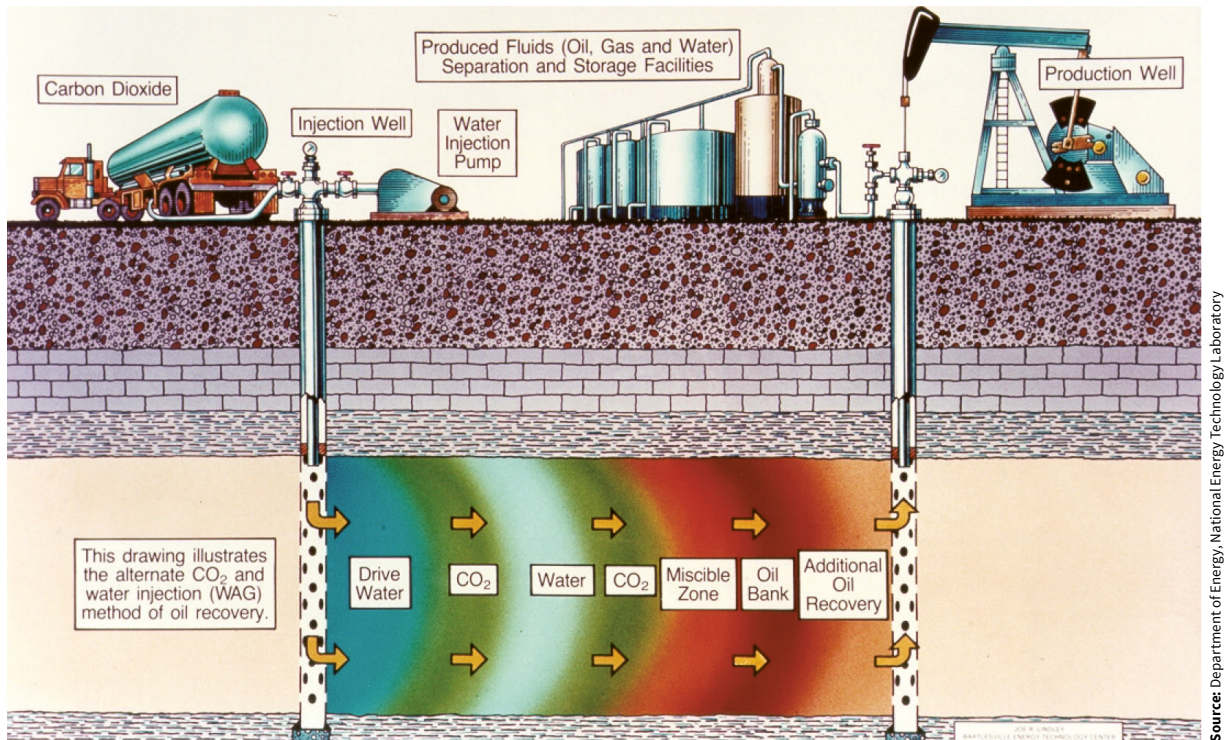
The most common use of captured carbon dioxide (CO<sub>2</sub>) is enhanced oil recovery, or EOR. While carbon capture utilization and storage (CCUS) may prove to be a viable strategy for addressing climate change, using captured carbon to increase the production of fossil fuels — i.e. oil and gas — runs counter to, and undermines the climate mitigation goals of carbon capture and storage. At the same time, CO<sub>2</sub>-EOR presents risks to groundwater, the surface environment, and the health of communities living near oil fields. As a known threat to drinking water sources, enhanced oil recovery is regulated by the federal Safe Drinking Water Act (SDWA) Underground Injection Control (UIC) program. Our research has found this program to be inadequate in protecting groundwater, relying on outdated rules, and insufficient data collection and staffing levels to ensure safety.

### What is CO<sub>2</sub>-EOR?

CO<sub>2</sub>-EOR includes several specific oil production methods that involve the injection of CO<sub>2</sub> into oil-bearing formations through injection wells. Together these technologies account for approximately 5% of US oil production associated with more than 13,000 CO<sub>2</sub> injection wells.<sup>1</sup> The main CO<sub>2</sub>-EOR technologies include:

- Continuous CO<sub>2</sub> injection;
- Continuous CO<sub>2</sub> injection followed by water injection;
- Water-alternating-gas (WAG) injection, the most common form of CO<sub>2</sub>-EOR, in which either fresh water or produced water (oil field wastewater) is injected in intervals between CO<sub>2</sub> injections;
- WAG followed by gas, in which a cheaper gas such as nitrogen is injected following the CO<sub>2</sub> injection cycle.

### Schematic of water-alternating-gas (WAG) CO<sub>2</sub>-EOR operation



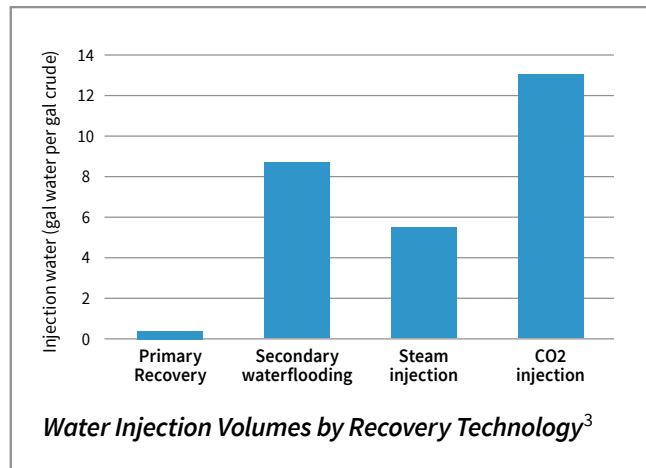
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### Environmental Risks of CO<sub>2</sub>-EOR

CO<sub>2</sub>-EOR presents many of the same environmental risks and threats to drinking water as other oil and gas production activities including hydraulic fracturing and conventional drilling, such as:

- Improper disposal and spills of chemicals, produced water and other wastes impacting surface and/or groundwater, air, and land;
- Well failures, leaks or breaches causing groundwater contamination;
- Migration of chemicals, wastewater or oil and gas through natural pathways or idle/abandoned wells; and
- Water consumption, acquisition, and competition with other uses.



CO<sub>2</sub>-EOR also presents unique threats to water and the environment:<sup>2</sup>

- CO<sub>2</sub>-EOR is one of the most water intensive forms of oil production, requiring an estimated 13 barrels of water for every barrel of oil produced on average, more than other forms of EOR.<sup>3</sup> EOR may utilize freshwater, which can present competing supply issues in water scarce areas. Most commonly though, EOR utilizes oil field wastewater, also known as produced water, which can be high in naturally occurring or added chemicals. Injecting, separating and disposing of high volumes of contaminated fluids presents risk of spills and leaks, and management challenges.
- Since EOR often occurs in older oil fields, outdated well construction standards not designed for CO<sub>2</sub>-EOR conditions may increase risk of equipment or well failures.
- Blowouts from CO<sub>2</sub>-EOR injection can and do occur. While there is a lack of comprehensive data on the risk or frequency of blowouts, numerous CO<sub>2</sub>-EOR blowouts have been recorded over the last 30 years.
- When CO<sub>2</sub> reacts with water in oil-producing formations, carbonic acid is produced, creating a corrosive environment. This reaction increases the risk of degradation and corrosion of equipment, and amplifies the threat of leaks and blowouts.
- The acidic environment can mobilize and dissolve elements and compounds that can impact drinking water sources, such as boron, barium, calcium, chromium, strontium, depending on the formation.
- Blowouts can pollute the surface environment if produced fluids, oil, and drilling muds are brought up the well are discharged. In 2011, a 37-day long blowout of a Denbury Resources well in the Tinsley Field, Mississippi, resulted in the removal of 27,000 tons of contaminated soil and 32,000 barrels of contaminated fluids.
- Blowouts can also impact air quality. In addition to reversing any potential climate benefits of CO<sub>2</sub> injection, large CO<sub>2</sub> releases can harm local wildlife and people. The Tinsley Field blowout led to health impacts for first responders and oil field workers, and the asphyxiation of animals in the area.

Finally, since CO<sub>2</sub>-EOR often extends the life of an oil field, sometimes by decades, the threats to water, air, land, and health, are all extended. Research has found that older oil fields have increased environmental (including climate) impacts, as dirtier, harder to reach oil is produced. More energy is required to extract and refine crude from older oilfields.<sup>4</sup> Additionally, as equipment ages, the likelihood of failures, spills, and leaks increases.

<sup>2</sup> For a deeper discussion of threats to water and regulatory issues with CO<sub>2</sub>-EOR, see the report *The Environmental Risks and Oversight of Enhanced Oil Recovery in the United States* available at: [www.cleanwateraction.org/eor-risks](http://www.cleanwateraction.org/eor-risks)

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## Appendix C: CCS Project Database as of 2018

Source: Global CCS Institute.

Facility Name	Lifecycle Stage	U.S. State	CO <sub>2</sub> Capture Capacity (Mtpa)	Operation Date	Industry	Capture Type	Transport Type	Transport Length (km)	Primary Storage Type
Terrell Natural Gas Processing Plant (formerly Val Verde Natural Gas Plants)	Operating	Texas	0.4–0.5	1972	Natural gas processing	Industrial separation	Pipeline	316	Enhanced oil recovery
Enid Fertilizer	Operating	Oklahoma	0.7	1982	Fertiliser production	Industrial separation	Pipeline	225	Enhanced oil recovery
Shute Creek Gas Processing Plant	Operating	Wyoming	7.0	1986	Natural gas processing	Industrial separation	Pipeline	Multiple, maximum of 460 km	Enhanced oil recovery
Century Plant	Operating	Texas	8.4	2010	Natural gas processing	Industrial separation	Pipeline	64 to 240	Enhanced oil recovery
Air Products Steam Methane Reformer	Operating	Texas	1.0	2013	Hydrogen production	Industrial separation	Pipeline	158	Enhanced oil recovery
Coffeyville Gasification Plant	Operating	Kansas	1.0	2013	Fertiliser production	Industrial separation	Pipeline	112	Enhanced oil recovery
Lost Cabin Gas Plant	Operating	Wyoming	0.9	2013	Natural gas processing	Industrial separation	Pipeline	374	Enhanced oil recovery
Petra Nova Carbon Capture	Operating	Texas	1.4	2017	Power generation	Post-combustion capture	Pipeline	132	Enhanced oil recovery
Illinois Industrial Carbon Capture and Storage	Operating	Illinois	1.0	2017	Ethanol production	Industrial separation	Pipeline	1.6	Dedicated geological storage — onshore deep saline formations
Lake Charles Methanol	Advanced development	Louisiana	4.2	2022 (Inst. est.)	Chemical production	Industrial separation	Pipeline	244	Enhanced oil recovery
Texas Clean Energy Project	Advanced development	Texas	1.5–2.0	2022 (Inst. est.)	Chemical production	Industrial separation	Pipeline	Not specified	Enhanced oil recovery

## Appendix C

### EPA GHG Reporting Under Subpart UU

Source: Data Extracted from EPA's FLIGHT Tool (<http://ghgdata.epa.gov/ghgp>). The data was reported to EPA by facilities as of 08/05/2017. All emissions data is presented in units of metric tons of carbon dioxide equivalent using GWP's from IPCC's AR4.  
 \*Note GHG Quantity under Subpart UU is considered Confidential Business Information and generally not publically disclosed.

2016	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	ARTESIA GAS PLANT	32.7564	-104.2111	Eddy	NM	Phillips 66 (50%); Spectra Energy (50%)	0	C,PP,UU,W
	Adair San Andres CO2 Injection Unit - Permian Basin 430	32.963812	-102.300327	Terry	TX	Apache Corp (100%)	0	UU
	Agave Dagger Draw Gas Plant	32.71629	-104.44602	Eddy	NM	Agave Energy Holdings (100%)	0	C,PP,UU,W
	Albert Spicer Upper Morrow Unit	36.4725	-100.5517	Ochiltree	TX	Chaparral Energy Inc (100%)	0	UU
	BPE GPRP Grasslands Gas Plant	47.59043	-104.0005	Mckenzie	ND	Oneok Partners LP (100%)	0	C,NN,PP,UU,W
	BPE GPRP Lignite Gas Plant	48.8743194	-102.5457778	Burke	ND	Oneok Partners LP (100%)	0	NN,PP,UU
	Bell Creek EOR Facility	45.354589	-105.67196	Powder River	MT	Denbury Resources Inc (100%)	0	UU
	Big Sand Draw CO2 Facility	35.46646	-97.51827	Oklahoma	OK	Devon Energy Corp (100%)	0	UU
	Bonanza Creek Energy - Arkla Basin	33.310999	-93.490239	Lafayette	AR	Bonanza Creek Energy Inc (100%)	0	UU,W
	Booker Troser Upper Morrow Unit	36.458	-100.5462	Ochiltree	TX	Chaparral Energy Inc (100%)	0	UU
	Brookhaven EOR Facility	31.590472	-90.515667	Lincoln	MS	Denbury Resources Inc (100%)	0	UU
	CIRCLE RIDGE FIELD	43.5255	-109.0461	Fremont	WY	Merit Energy Co LLC (100%)	0	UU
	Camrick Unit	36.521	-100.8975	Beaver	OK	Chaparral Energy Inc (100%)	0	UU
	Celero Energy II, LP 430 Permian Basin	31.99987	-102.07848	Midland	TX	Celero Energy II LP (100%);	0	
	Citronelle Alabama Power Project	31.077872	-88.23407	Mobile	AL	Denbury Resources Inc (100%)	0	UU
	ConocoPhillips' Permian (430)	32.02786	-102.09198	Midland	TX	Conocophillips (100%)	0	UU,W
	Core Energy Otsego County EOR Operations	45.033842	-84.511469	Otsego	MI	Core Energy LLC (100%)	0	UU
	Cranfield EOR Facility	31.486641	-91.09694	Franklin	MS	Denbury Resources Inc (100%)	0	UU
	Delaware Basin Gas Plant	31.1599754	-103.1048449		TX	Enterprise Products Partners LP (50%); Occidental Petroleum Corp (50%)	0	C,PP,UU,W
	Delhi EOR Facility	32.441732	-91.588175	Richland Parish	LA	Denbury Resources Inc (100%)	0	UU
	Dilley Treating Facility	28.461253	-99.10135	La Salle	TX	Williams Partners, LP (100%)	0	C,PP,UU,W
	Dollarhide CO2 Flood	32.145954	-103.048034	Andrews	TX	Chevron Corp (61.47041%); Permian Basin LP (37.82824%)	0	UU
	Elk Basin Gas Plant	44.866702	-108.814934	Park	WY	Vanguard Natural Resources Inc (100%)	0	C,NN,UU,W
	Emma San Andres Field	32.121352	-102.63604	Andrews	TX	Tabula Rasa Partners (100%)	0	UU
	Energen Resources Corporation 430 Permian Basin	33.520058	-86.807637	Jefferson	AL	Energen Corp (100%)	0	UU,W
	Eucutta EOR Facility	31.78154	-88.82722	Wayne	MS	Denbury Resources Inc (100%)	0	UU
	Farnsworth Unit CO2 Flood	36.2653	-101.026	Hansford	TX	Chaparral Energy Inc (100%)	0	UU
	Fasken Oil and Ranch, Ltd. 430 Permian Basin	32.04663	-102.16955	Midland	TX	Fasken Oil & Ranch Ltd (100%)	0	UU,W
	GARLAND UNIT	44.7953	-108.5459	Big Horn	WY	Merit Energy Co LLC (100%)	0	UU
	GRASS CREEK FIELD	43.9588	-108.6635	Hot Springs	WY	Merit Energy Co LLC (100%)	0	UU
	Goldsmith Landreth San Andres Unit Injection Facility	31.9873	-102.64999	Ector	TX	Kinder Morgan Inc (100%)	0	UU
	Gramstorff Upper Morrow Unit	36.4689	-100.5608	Ochiltree	TX	Chaparral Energy Inc (100%)	0	UU
	Grieve EOR Facility	42.742331	-107.003784	Natrona	WY	Denbury Resources Inc (100%)	0	UU
	HAMILTON DOME GAS INJECTION	43.7797	-108.5719	Hot Springs	WY	Merit Energy Co LLC (100%)	0	UU
	Hartland 36 Injection Well 1	42.618942	-83.687829	Oakland	MI	Merit Energy Co LLC (100%)	0	
	Hastings EOR Facility	29.49997	-95.24695	Brazoria	TX	Denbury Resources Inc (100%)	0	UU
	Heidelberg EOR Facility	31.880389	-89.007389	Jasper	MS	Denbury Resources Inc (100%)	0	UU
	Hobbs / Seminole / WCF	32.698752	-102.713512	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU
	Howard Glascock Sour Gas Injection Facility	32.1425	-101.2683	Howard	TX	Conocophillips (100%)	0	UU
	INDIAN BASIN GAS PLANT	32.466667	-104.570556	Eddy	NM	Enterprise Products Partners LP (42.2%); Occidental Petroleum Corp (39.1%); Chevron Corp (2.1%); Ngl Ventures LLC (16.6%)	0	C,UU,W
	JAL #3 GAS PLANT	32.1742	-103.1741	Lea	NM	Energy Transfer Partners LP (100%)	0	C,UU,W

Appendix C continued

2016	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	Katz Field Injection	33.427683	-99.834815	Knox	TX	Kinder Morgan Inc (100%)	0	UU
	LINAM RANCH GAS PLANT	32.6953	-103.2853	Lea	NM	Phillips 66 (50%); Spectra Energy (50%)	0	C,PP,UU,W
	LOST SOLDIER UNIT EOR PROJECT	42.0955	-107.0417	Carbon	WY	Merit Energy Co LLC (100%)	0	UU
	Lancaster Ranch Compressor Station and Treating Facility	28.726014	-99.037991	Frio	TX	Southcross Energy (100%)	0	C,UU,W
	Levelland / Anton CO2 FLDS	33.866995	-101.866362	Hale County	TX	Occidental Petroleum Corp (100%)	0	UU
	Little Creek EOR Facility	31.34483	-90.35765	Pike County	MS	Denbury Resources Inc (100%)	0	UU
	Lockhart Crossing EOR Facility	30.519792	-90.885878	Livingston Parish	LA	Denbury Resources Inc (100%)	0	UU
	Mabee CO2 Flood	32.2097805	-102.2279694	Contra Costa	TX	Chevron Corp (100%)	0	UU
	Madison CO2 Facility	42.848253	-108.318744	Fremont	WY	Devon Energy Corp (100%)	0	UU
	Maljamar Gas Plant	32.813792	-103.771877	Lea	NM	Aka Energy Group LLC (100%)	0	C,UU,W
	Mallalieu EOR Facility	31.493889	-90.410278	Lincoln	MS	Denbury Resources Inc (100%)	0	UU
	Martinville EOR Facility	31.999323	-89.763408	Simpson	MS	Denbury Resources Inc (100%)	0	UU
	Monell CO2 Supplier	41.5744	-108.5414	Sweetwater	WY	Fdl Operating LLC (100%)	0	UU
	Mountaineer (1301)	38.9794	-81.9344	Mason	WV	American Electric Power (100%)	0	C,D,PP,UU
	Murmyluk & State Lenox 3-36 GIW	42.731065	-82.732957	Macomb	MI	Merit Energy Co LLC (100%)	0	
	N.W. Velma Hoxbar Unit	34.4886	-97.7126	Stephens	OK	Chaparral Energy Inc (100%)	0	UU
	NE PURDY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co LLC (100%)	0	UU
	North Burbank Unit	36.82491	-96.73257	Osage	OK	Chaparral Energy Inc (100%)	0	UU
	North Perryton Unit	36.4884	-100.894	Ochiltree	TX	Chaparral Energy Inc (100%)	0	UU
	North Shore Midstream, LLC	41.38719	-108.74324	Sweetwater	WY	Merit Energy Co LLC (100%)	0	
	OREGON BASIN UNIT	44.3572	-108.9115	Park	WY	Merit Energy Co LLC (100%)	0	UU
	Odessa RMT	31.969907	-102.644587	Ector	TX	Occidental Petroleum Corp (100%)	0	UU
	Olive EOR Facility	31.309475	-90.552713	Amite	MS	Denbury Resources Inc (100%)	0	UU
	Oyster Bayou EOR Facility	29.692444	-94.5065	Chambers	TX	Denbury Resources Inc (100%)	0	UU
	PCA Gillespie 5-23A	44.291878	-86.209517	Manistee	MI	Merit Energy Co LLC (100%)	0	UU
	PITCHFORK FIELD	44.1362	-109.0618	Park County	WY	Merit Energy Co LLC (100%)	0	UU
	Postle CO2 Injection	36.9049	-101.613	Texas	OK	Breitburn Energy Co LP (100%)	0	UU
	Rangely CO2 Flood	40.0975111	-108.8768111	Contra Costa	CO	Chevron Corp (68.069512%); Whiting Oil & Gas Corp (4.613916%); Arp Rangely Production LLC (25.24566%)	0	UU
	Resolute Natural Resources Company, LLC. 585 Paradox Basin	39.742905	-104.98738	Denver	CO	Resolute Energy Corp (100%)	0	UU,W
	Riley Ridge Gas Plant	42.5011	-110.4228	Sublette	WY	Denbury Resources Inc (100%)	0	C,PP,UU,W
	Roberts CO2 Injection Field Basin 430	32.9261999	-102.8744945		TX	Apache Corp (100%)	0	UU
	SACROC Field Injection	32.912768	-100.935494	Scurry	TX	Kinder Morgan Inc (100%)	0	UU
	SAN JUAN RIVER GAS PLANT	36.7592	-108.35967	San Juan	NM	Castleton Commodities International LLC (100%)	0	C,UU,W
	SCHAFER COMPRESSOR STATION	35.5622	-101.1222	Carson	TX	Regency Energy Partners LP (100%)	0	UU
	SE BRADLEY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co LLC (100%)	0	UU
	SPRING CREEK SOUTH FIELD	44.2267	-109.075	Park	WY	Merit Energy Co LLC (100%)	0	UU
	Salt Creek CO2 Supplier	43.4024	-104.2875	Niobrara	WY	Fdl Operating LLC (77%); Linn Energy (23%)	0	UU
	Seminole East Field (SEF)	32.7337999	-102.591659	Gaines	TX	Tabula Rasa Partners (100%)	0	UU
	Seminole San Andres Unit	32.754733	-102.693432	Gaines	TX	Hess Corp (100%)	0	UU
	Shute Creek Facility	41.8805	-110.0904	Lincoln	WY	Exxonmobil Corp (100%)	0	C,PP,UU,W
	Simpson L2-29 HD-1 GIW	44.791048	-85.060108	Kalkaska	MI	Merit Energy Co LLC (100%)	0	
	Slaughter / Welch / Cedar Lake	32.85711	-102.25526	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU
	Slaughter CO2 Injection Field Basin 430	33.471926	-102.53186	Hockley	TX	Apache Corp (100%)	0	UU
	Snyder RMT	32.912768	-100.935494	Scurry	TX	Occidental Petroleum Corp (100%)	0	UU
	Soso EOR Facility	31.809704	-89.311519	Jones	MS	Denbury Resources Inc (100%)	0	UU
	State Frederic 3-2 SWD	44.848915	-84.75335	Crawford	MI	Merit Energy Co LLC (100%)	0	UU
	State Kalkaska 1-24F EOR	44.291878	-85.225829	Missaukee	MI	Merit Energy Co LLC (100%)	0	UU



## Appendix C *continued*

2016	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	Sundown CO2 Flood	33.430853	-102.491935	Hockley	TX	Chevron Corp (97.62208%); Xto Energy Inc (2.37792%)	0	UU
Targa Velma Gas Processing Plant	34.4615	-97.6905	Stephens	OK	Targa Resources (100%)	0	C,PP,UU,W	
Tilden Gas Plant	28.409989	-98.530139	Mcmullen	TX	Regency Energy Partners LP (100%)	0	C,UU,W	
Tall Cotton Central Production Facility	32.783643	-102.889578		TX	Kinder Morgan Inc (100%)	0	UU	
Targa Midstream Services Llc - Eunice Gas Processing Plant	32.42615	-103.148564	Lea	NM	Targa Resources (100%)	0	C,PP,UU,W	
Targa Midstream Services Llc - Monument Gas Processing Plant	32.610278	-103.311944	Lea	NM	Targa Resources (100%)	0	C,PP,UU,W	
Targa Midstream Services Llc - Sandhills Gas Plant	31.501667	-102.640277	Crane	TX	Targa Resources (100%)	0	C,PP,UU,W	
Tinsley Eor Facility	32.688901	-90.616484	Yazoo	MS	Denbury Resources Inc (100%)	0	UU	
Vacuum Co2 Flood	32.787772	-103.5103417	Contra Costa	NM	Conocophillips (7.60453%); Chevron Corp (59.99148%); Mobil Producing Texas & New Mexico (3.96743%); Marathon Oil Co (25.55532%); Quantum Aspect Ptp LP (1.98966%)	0	UU	
Waha Gas Plant	31.268888	-103.086666	Pecos	TX	Regency Energy Partners LP (100%)	0	C,UU,W	
Wertz Unit Eor Project	42.0955	-107.0417	Carbon	WY	Merit Energy Co LLC (100%)	0	UU	
Waha Gas Plant	31.159975	-103.104845	Pecos	TX	Enterprise Products Partners LP (100%)	0		
Wasson San Andres	33.00338	-102.81901	Yoakum	TX	Occidental Petroleum Corp (100%)	0	UU	
Wellman	33.034887	-102.353829	Terry	TX	Trinity Co2, LLC (100%);	0		
West Ranch Field	28.8084084	-96.6157192		TX	Texas Coastal Ventures LLC (100%)	0	UU,W	
Wickett Co2 Injection	31.5269	-102.9709	Ward	TX	Four Corners Petroleum Ii LLC (100%)	0	UU	
XTO Cordona Lake Field CO2 Injection	31.31685	-102.54896	Crane	TX	Exxonmobil Corp (100%)	0	UU	
XTO Cornell Mahoney Field CO2 Injection	33.036433	-102.826353	Yoakum	TX	Exxonmobil Corp (100%)	0	UU	
XTO GSAU Field CO2 Injection	31.931	-102.61742	Ector	TX	Exxonmobil Corp (100%)	0	UU	
XTO Hawkins Field Injection	32.28248	-95.27886	Smith	TX	Exxonmobil Corp (100%)	0	UU	
XTO Means Field CO2 Injection	32.43775	-102.53519	Andrews	TX	Exxonmobil Corp (100%)	0	UU	
Yates Field Injection	30.927832	-102.026135	Pecos	TX	Kinder Morgan Inc (100%)	0	UU	
ZIA II GAS PLANT	32.643022	-103.8088667	Lea	NM	Phillips 66 (50%); Spectra Energy (50%)	0	C,PP,UU,W	

## Appendix C *continued*

Source: Data Extracted from EPA's FLIGHT Tool (<http://ghgdata.epa.gov/ghgp>). The data was reported to EPA by facilities as of 08/05/2017. All emissions data is presented in units of metric tons of carbon dioxide equivalent using GWP's from IPCC's AR4.

\*Note GHG Quantity under Subpart UU is considered Confidential Business Information and generally not publically disclosed.

2015	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	ARTESIA GAS PLANT	32.7564	-104.2111	Eddy	NM	Phillips 66 (50%); Spectra Energy Corp (50%)	0	C,PP,UU,W
Adair San Andres CO2 Injection Unit - Permian Basin 430	32.963812	-102.300327	Terry	TX	Apache Corp (100%)	0	UU	
Agave Dagger Draw Gas Plant	32.71629	-104.44602	Eddy	NM	Agave Energy Holdings (100%)	0	C,PP,UU,W	
Albert Spicer Upper Morrow Unit	36.4725	-100.5517	Ochiltree	TX	Chaparral Energy Inc (100%)	0	UU	
Archer Daniels Midland Co.	39.8675	-88.885	Macon	IL	Archer Daniels Midland Co (100%)	0	C,II,PP,UU	
BPE GPRP Grasslands Gas Plant	47.59043	-104.0005	Mckenzie	ND	Oneok Partners LP (100%)	0	C,NN,PP,UU,W	
BPE GPRP Lignite Gas Plant	48.8743194	-102.5457778	Burke	ND	Oneok Partners LP (100%)	0	NN,PP,UU	
Bell Creek EOR Facility	45.354589	-105.67196	Powder River	MT	Denbury Resources Inc (100%)	0	UU	
Big Sand Draw CO2 Facility	35.46646	-97.51827	Oklahoma	OK	Devon Energy Corp (100%)	0	UU	
Bonanza Creek Energy - Arkla Basin	33.310999	-93.490239	Lafayette	AR	Bonanza Creek Energy Inc (100%)	0	UU,W	
Booker Trosper Upper Morrow Unit	36.458	-100.5462	Ochiltree	TX	Chaparral Energy Inc (100%)	0	UU	
Brookhaven EOR Facility	31.590472	-90.515667	Lincoln	MS	Denbury Resources Inc (100%)	0	UU	
Camrick Unit	36.521	-100.8975	Beaver	OK	Chaparral Energy Inc (100%)	0	UU	
Celero Energy II, LP 430 Permian Basin	31.99987	-102.07848	Midland	TX	Celero Energy II LP (100%);	0		
Citronelle Alabama Power Project	31.077872	-88.23407	Mobile	AL	Denbury Resources Inc (100%)	0	UU	
ConocoPhillips' Permian (430)	32.02786	-102.09198	Midland	TX	Conocophillips (100%)	0	UU,W	
Core Energy Otsego County EOR Operations	45.033842	-84.511469	Otsego	MI	Core Energy LLC (100%)	0	UU	
Cranfield EOR Facility	31.486641	-91.09694	Franklin	MS	Denbury Resources Inc (100%)	0	UU	
Delhi EOR Facility	32.441732	-91.588175	Richland Parish	LA	Denbury Resources Inc (100%)	0	UU	
Dollarhide CO2 Flood	32.145954	-103.048034	Andrews	TX	Chevron Corp (61.47041%); Permian Basin Ltd Ptp (37.82824%)	0	UU	
Elk Basin Gas Plant	44.866702	-108.814934	Park	WY	Vanguard Natural Resources Inc (100%)	0	C,NN,UU,W	
Energen Resources Corporation 430 Permian Basin	33.520058	-86.807637	Jefferson	AL	Energen Corp (100%)	0	UU,W	
Eucutta EOR Facility	31.78154	-88.82722	Wayne	MS	Denbury Resources Inc (100%)	0	UU	
Farnsworth Unit CO2 Flood	36.2653	-101.026	Hansford	TX	Chaparral Energy Inc (100%)	0	UU	
Fasken Oil and Ranch, Ltd. 430 Permian Basin	32.04663	-102.16955	Midland	TX	Fasken Oil & Ranch Ltd (100%)	0	UU,W	
Goldsmith Landreth San Andres Unit Injection Facility	31.9873	-102.64999	Ector	TX	Kinder Morgan (100%)	0	UU	
Gramstorff Upper Morrow Unit	36.4689	-100.5608	Ochiltree	TX	Chaparral Energy Inc (100%)	0	UU	
Grieve EOR Facility	42.742331	-107.003784	Natrona	WY	Denbury Resources Inc (100%)	0	UU	
HAMILTON DOME GAS INJECTION	43.7797	-108.5719	Hot Springs	WY	Merit Energy Co LLC (100%)	0	UU	
Hartland 36 Injection Well 1	42.618942	-83.687829	Oakland	MI	Merit Energy Co LLC (100%)	0	UU	
Hastings EOR Facility	29.49997	-95.24695	Brazoria	TX	Denbury Resources Inc (100%)	0	UU	
Heidelberg EOR Facility	31.880389	-89.007389	Jasper	MS	Denbury Resources Inc (100%)	0	UU	
Hobbs / Seminole / WCF	32.698752	-102.713512	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU	
Howard Glascock Sour Gas Injection Facility	32.1425	-101.2683	Howard	TX	Conocophillips (100%)	0	UU	
Indian Basin Gas Plant	32.466667	-104.570556	Eddy	NM	Enterprise Products Partners LP (42.2%); Occidental Petroleum Corp (39.1%); Chevron Corp (2.1%); Ngl Ventures LLC (16.6%)	0	C,UU,W	
Jal #3 Gas Plant	32.1742	-103.1741	Lea	NM	Energy Transfer Partners LP (100%)	0	C,UU,W	
Katz Field Injection	33.427683	-99.834815	Knox	TX	Kinder Morgan (100%)	0	UU	
Linam Ranch Gas Plant	32.6953	-103.2853	Lea	NM	Phillips 66 (50%); Spectra Energy (50%)	0	C,PP,UU,W	
Lost Soldier Unit EOR Project	42.0955	-107.0417	Carbon	WY	Merit Energy Co LLC (100%)	0	UU	
Lancaster Ranch Compressor Station and Treating Facility	28.726014	-99.037991	Frio	TX	Southcross Energy (100%)	0	C,UU,W	
Levelland / Anton CO2 FLDS	33.866995	-101.866362	Hale	TX	Occidental Petroleum Corp (100%)	0	UU	
Little Creek EOR Facility	31.34483	-90.35765	Pike	MS	Denbury Resources Inc (100%)	0	UU	

Appendix C continued

2015	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	Lockhart Crossing EOR Facility	30.519792	-90.885878	Livingston Parish	LA	Denbury Resources Inc (100%)	0	UU
Mabee CO2 Flood	32.2097805	-102.2279694	Contra Costa	TX	Chevron Corp (100%)	0	UU	
Madison CO2 Facility	42.848253	-108.318744	Fremont	WY	Devon Energy Corp (100%)	0	UU	
Maljamar Gas Plant	32.813792	-103.771877	Lea	NM	Aka Energy Group LLC (100%)	0	C,UU,W	
Mallalieu EOR Facility	31.493889	-90.410278	Lincoln	MS	Denbury Resources Inc (100%)	0	UU	
Martinville EOR Facility	31.999323	-89.763408	Simpson	MS	Denbury Resources Inc (100%)	0	UU	
Monell CO2 Supplier	41.5744	-108.5414	Sweetwater	WY	Fdl Operating LLC (100%)	0	UU	
Mountaineer (1301)	38.9794	-81.9344	Mason	WV	American Electric Power (100%)	0	C,D,PP,UU	
Murmyluk & State Lenox 3-36 GIW	42.731065	-82.732957	Macomb	MI	Merit Energy Co LLC (100%)	0	UU	
N.W. Velma Hoxbar Unit	34.4886	-97.7126	Stephens	OK	Chaparral Energy Inc (100%)	0	UU	
NE PURDY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co LLC (100%)	0	UU	
North Burbank Unit	36.82491	-96.73257	Osage	OK	Chaparral Energy Inc (100%)	0	UU	
North Perryton Unit	36.4884	-100.894	Ochiltree	TX	Chaparral Energy Inc (100%)	0	UU	
North Shore Midstream, LLC	41.38719	-108.74324	Sweetwater	WY	Merit Energy Co LLC (100%)	0	C,UU	
Odessa RMT	31.969907	-102.644587	Ector	TX	Occidental Petroleum Corp (100%)	0	UU	
Olive EOR Facility	31.309475	-90.552713	Amite	MS	Denbury Resources Inc (100%)	0	UU	
Oyster Bayou EOR Facility	29.692444	-94.5065	Chambers	TX	Denbury Resources Inc (100%)	0	UU	
PCA Gillespie 5-23A	44.291878	-86.209517	Manistee	MI	Merit Energy Co LLC (100%)	0	UU	
Platform Hermosa	34.454167	-120.646667		CA	Anadarko Petroleum Corp (8.26%); Freeport Mcmoran Copper & Gold (69.34%); Whiting Petroleum Corp (6.07%); Koch Industries Inc (4.3%); Devon Energy Corp (10.33%); Harvest Energy Inc (1.7%)	0	C,UU,W	
Postle Co2 Injection	36.9049	-101.613	Texas	OK	Breitbart Energy Partners LP (100%)	0	UU	
Rangely Co2 Flood	40.0975111	-108.8768111	Contra Costa	CO	Chevron Corp (68.069512%); Whiting Oil & Gas Corp (4.613916%); Arp Rangely Production LLC (25.24566%)	0	UU	
Resolute Natural Resources Company, Llc. 585 Paradox Basin	39.742905	-104.98738	Denver	CO	Resolute Energy Corp (100%)	0	UU,W	
Riley Ridge Gas Plant	42.5011	-110.4228	Sublette	WY	Denbury Resources Inc (100%)	0	C,PP,UU,W	
Roberts Co2 Injection Field Basin 430	32.9261999	-102.8744945		TX	Apache Corp (100%)	0	UU	
Sacroc Field Injection	32.912768	-100.935494	Scurry	TX	Kinder Morgan (100%)	0	UU	
San Juan River Gas Plant	36.7592	-108.35967	San Juan	NM	Castleton Commodities International LLC (100%)	0	C,UU,W	
Schafer Compressor Station	35.5622	-101.1222	Carson	TX	Regency Energy Partners LP (100%)	0	UU	
Se Bradley Unit Eor Project	36.9067	-101.6166	Texas	OK	Merit Energy Co LLC (100%)	0	UU	
Salt Creek Co2 Supplier	43.4024	-104.2875	Niobrara	WY	Fdl Operating LLC (77%); Linn Energy (23%)	0	UU	
Seminole East Field (Sef)	32.7337999	-102.591659	Gaines	TX		0	UU	
Seminole San Andres Unit	32.754733	-102.693432	Gaines	TX	Hess Corp (100%)	0	UU	
Shute Creek Facility	41.8805	-110.0904	Lincoln	WY	Exxon Mobil Corp (100%)	0	C,PP,UU,W	
Simpson L2-29 Hd-1 Giw	44.791048	-85.060108	Kalkaska	MI	Merit Energy Co LLC (100%)	0	UU	
Slaughter / Welch / Cedar Lake	32.85711	-102.25526	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU	
Slaughter Co2 Injection Field Basin 430	33.471926	-102.53186	Hockley	TX	Apache Corp (100%)	0	UU	
Snyder Rmt	32.912768	-100.935494	Scurry	TX	Occidental Petroleum Corp (100%)	0	UU	
Soso Eor Facility	31.809704	-89.311519	Jones	MS	Denbury Resources Inc (100%)	0	UU	
State Frederic 3-2 Swd	44.848915	-84.75335	Crawford	MI	Merit Energy Co LLC (100%)	0	UU	
State Kalkaska 1-24F Eor	44.291878	-85.225829	Missaukee	MI	Merit Energy Co LLC (100%)	0	UU	
Sundown Co2 Flood	33.430853	-102.491935	Hockley	TX	Chevron Corp (97.62208%); Xto Energy Inc (2.37792%)	0	UU	
Targa Velma Gas Processing Plant	34.4615	-97.6905	Stephens	OK	Targa Resources (100%)	0	C,PP,UU,W	
Tilden Gas Plant	28.409989	-98.530139	Mcmullen	TX	Regency Energy Partners LP (100%)	0	C,UU,W	
Tall Cotton Central Production Facility	32.783643	-102.889578		TX	Kinder Morgan (100%)	0	UU	
Targa Midstream Services LLC - Eunice Gas Processing Plant	32.42615	-103.148564	Lea	NM	Targa Resources (100%)	0	C,PP,UU,W	

## Appendix C *continued*

2015	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	Targa Midstream Services LLC - Monument Gas Processing Plant	32.610278	-103.311944	Lea	NM	Targa Resources (100%)	0	C,PP,UU,W
	Targa Midstream Services LLC - Sandhills Gas Plant	31.501667	-102.640277	Crane	TX	Targa Resources (100%)	0	C,PP,UU,W
	Tinsley EOR Facility	32.688901	-90.616484	Yazoo	MS	Denbury Resources Inc (100%)	0	UU
	Vacuum CO2 Flood	32.787772	-103.5103417	Contra Costa	NM	Conocophillips (7.60453%); Chevron Corp (59.99148%); Mobil Producing Texas & New Mexico (3.96743%); Marathon Oil Co (25.55532%); Quantum Aspect Ptp LP (1.98966%)	0	UU
	Waha Gas Plant	31.268888	-103.086666	Pecos	TX	Regency Energy Partners LP (100%)	0	C,UU,W
	Wertz Unit Eor Project	42.0955	-107.0417	Carbon	WY	Merit Energy Co LLC (100%)	0	UU
	Waha Gas Plant	31.159975	-103.104845	Pecos	TX	Enterprise Products Partners LP (100%)	0	C,PP,UU,W
	Wasson San Andres	33.00338	-102.81901	Yoakum	TX	Occidental Petroleum Corp (100%)	0	UU
	Wellman	33.034887	-102.353829	Terry	TX	Trinity Co2, LLC (100%);	0	
	Wickett CO2 Injection	31.5269	-102.9709	Ward	TX	Whiting Petroleum Corp (100%)	0	UU
	XTO Cordona Lake Field CO2 Injection	31.31685	-102.54896	Crane	TX	Exxonmobil Corp (100%)	0	UU
	XTO Cornell Mahoney Field CO2 Injection	33.036433	-102.826353	Yoakum	TX	Exxonmobil Corp (100%)	0	UU
	XTO GSAU Field CO2 Injection	31.931	-102.61742	Ector	TX	Exxonmobil Corp (100%)	0	UU
	XTO Hawkins Field Injection	32.28248	-95.27886	Smith	TX		0	UU
XTO Means Field CO2 Injection	32.43775	-102.53519	Andrews	TX	Exxonmobil Corp (100%)	0	UU	
Yates Field Injection	30.927832	-102.026135	Pecos	TX	Kinder Morgan (100%)	0	UU	
ZIA II GAS PLANT	32.643022	-103.8088667	Lea	NM	Phillips 66 (50%); Spectra Energy (50%)	0	C,PP,UU,W	



## Appendix C *continued*

Source: Data Extracted from EPA's FLIGHT Tool (<http://ghgdata.epa.gov/ghgp>). The data was reported to EPA by facilities as of 08/05/2017. All emissions data is presented in units of metric tons of carbon dioxide equivalent using GWP's from IPCC's AR4.

\*Note GHG Quantity under Subpart UU is considered Confidential Business Information and generally not publically disclosed.

2014	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	ARTESIA GAS PLANT	32.7564	-104.2111	Eddy	NM	Phillips 66 (50%); Spectra Energy Corp (50%)	0	C,PP,UU,W
	Adair San Andres CO2 Injection Unit - Permian Basin 430	32.963812	-102.300327	Terry	TX	Apache Corp (100%)	0	UU
	Agave Dagger Draw Gas Plant	32.71629	-104.44602	Eddy	NM	Yates Petroleum Corporation (100%)	0	PP,UU
	Albert Spicer Upper Morrow Unit	36.4725	-100.5517	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	Archer Daniels Midland Co.	39.8675	-88.885	Macon	IL	Archer Daniels Midland Co (100%)	301375	C,II,PP,UU
	BPE GPRP Grasslands Gas Plant	47.59043	-104.0005	Mckenzie	ND	Oneok Partners, L.p. (100%)	0	C,NN,PP,UU,W
	BPE GPRP Lignite Gas Plant	48.8743194	-102.5457778	Burke	ND	Oneok Partners, L.p. (100%)	0	NN,PP,UU
	Bell Creek EOR Facility	45.354589	-105.67196	Powder River	MT	Denbury Resources, Inc (100%)	0	UU
	Big Sand Draw CO2 Facility	35.46646	-97.51827	Oklahoma	OK	Devon Energy (100%)	0	UU
	Bonanza Creek Energy - Arkla Basin	33.310999	-93.490239	Lafayette	AR	Bonanza Creek Energy, Inc (100%)	0	UU,W
	Booker Trosper Upper Morrow Unit	36.458	-100.5462	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	Brookhaven EOR Facility	31.590472	-90.515667	Lincoln	MS	Denbury Resources, Inc (100%)	0	UU
	Camrick Unit	36.521	-100.8975	Beaver	OK	Chaparral Energy, Inc (100%)	0	UU
	Celero Energy II, LP 430 Permian Basin	31.99987	-102.07848	Midland	TX	Celero Energy II LP (100%);	0	
	Citronelle Alabama Power Project	31.077872	-88.23407	Mobile	AL	Denbury Onshore, LLC (100%)	13942	UU
	ConocoPhillips' Permian (430)	32.02786	-102.09198	Midland	TX	Conoco Phillips (100%)	0	UU,W
	Core Energy Otsego County EOR Operations	45.033842	-84.511469	Otsego	MI	Core Energy LLC (100%)	0	UU
	Cranfield EOR Facility	31.486641	-91.09694	Franklin	MS	Denbury Resources, Inc (100%)	0	UU
	Delhi EOR Facility	32.441732	-91.588175	Richland Parish	LA	Denbury Resources, Inc (100%)	0	UU
	Dollarhide CO2 Flood	32.145954	-103.048034	Andrews	TX	Chevron Corporation (61.47041%); Permian Basin Ltd Ptp (37.82824%)	0	UU
	Elk Basin Gas Plant	44.866702	-108.814934	Park	WY	Vanguard Natural Resources, LLC (100%)	0	C,NN,UU,W
	Energen Resources Corporation 430 Permian Basin	33.520058	-86.807637	Jefferson	AL	Energen Corp (100%)	0	UU,W
	Eucutta EOR Facility	31.78154	-88.82722	Wayne	MS	Denbury Resources, Inc (100%)	0	UU
	Farnsworth Unit CO2 Flood	36.2653	-101.026	Hansford	TX	Chaparral Energy, Inc (100%)	0	UU
	Fasken Oil and Ranch, Ltd. 430 Permian Basin	32.04663	-102.16955	Midland	TX	Fasken Oil And Ranch, Ltd (100%)	0	UU,W
	Goldsmith Landreth San Andres Unit Injection Facility	31.9873	-102.64999	Ector	TX	Kinder Morgan Production Company, LLC (100%)	0	UU
	Gramstorff Upper Morrow Unit	36.4689	-100.5608	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	Grieve EOR Facility	42.742331	-107.003784	Natrona	WY	Denbury Resources, Inc (100%)	0	UU
	HAMILTON DOME GAS INJECTION	43.7797	-108.5719	Hot Springs	WY	Merit Energy Co, LLC (100%)	0	UU
	Hartland 36 Injection Well 1	42.618942	-83.687829	Oakland	MI	Merit Energy Co, LLC (100%)	0	UU
	Hastings EOR Facility	29.49997	-95.24695	Brazoria	TX	Denbury Resources, Inc (100%)	0	UU
	Hawkins Gas Plant	32.6105	-95.1957	Wood	TX	Exxonmobil Corp (100%)	0	C,UU,W
	Heidelberg EOR Facility	31.880389	-89.007389	Jasper	MS	Denbury Resources, Inc (100%)	0	UU
	Hobbs / Seminole / WCF	32.698752	-102.713512	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU
	INDIAN BASIN GAS PLANT	32.466667	-104.570556	Eddy	NM	Enterprise LLC (42.2%); Occidental Petroleum Corp (39.1%); Chevron Corp (2.1%); Ngl Ventures LLC (16.6%)	0	C,UU,W
	JAL #3 GAS PLANT	32.1742	-103.1741	Lea	NM	Energy Transfer Partners, LP (100%)	0	C,UU,W
	Katz Field Injection	33.427683	-99.834815	Knox	TX	Kinder Organ Production Company LLC (100%)	0	UU
	LINAM RANCH GAS PLANT	32.6953	-103.2853	Lea	NM	Phillips 66 (50%); Spectra Energy Corp (50%)	0	C,PP,UU,W
	LOST SOLDIER UNIT EOR PROJECT	42.0955	-107.0417	Carbon	WY	Merit Energy Co, LLC (100%)	0	UU
	Lancaster Ranch Compressor Station and Treating Facility	28.726014	-99.037991	Frio	TX	Texstar Midstream Services, LP (100%)	0	C,UU,W
	Levelland / Anton CO2 FLDS	33.866995	-101.866362	Hale	TX	Occidental Petroleum Corp (100%)	0	UU
	Little Creek EOR Facility	31.34483	-90.35765	Pike	MS	Denbury Resources, Inc (100%)	0	UU

Appendix C continued

2014	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	Lockhart Crossing EOR Facility	30.519792	-90.885878	Livingston Parish	LA	Denbury Resources, Inc (100%)	0	UU
	Mabee CO2 Flood	32.2097805	-102.2279694	Contra Costa	TX	Chevron Corp (100%)	0	UU
	Madison CO2 Facility	42.848253	-108.318744	Fremont	WY	Devon Energy (100%)	0	UU
	Maljamar Gas Plant	32.813792	-103.771877	Lea	NM	Aka Energy Group, LLC (100%)	0	C,UU,W
	Mallalieu EOR Facility	31.493889	-90.410278	Lincoln	MS	Denbury Resources, Inc (100%)	0	UU
	Martinville EOR Facility	31.999323	-89.763408	Simpson	MS	Denbury Resources, Inc (100%)	0	UU
	Monell CO2 Supplier	41.5744	-108.5414	Sweetwater	WY	Anadarko Petroleum Corp (100%)	0	UU
	Mountaineer (1301)	38.9794	-81.9344	Mason	WV	American Electric Power (100%)	0	C,D,PP,UU
	Murmyluk & State Lenox 3-36 GIW	42.731065	-82.732957	Macomb	MI	Merit Energy Co, LLC (100%)	0	UU
	N.W. Velma Hoxbar Unit	34.4886	-97.7126	Stephens	OK	Chaparral Energy, Inc (100%)	0	UU
	NE PURDY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co, LLC (100%)	0	UU
	North Burbank Unit	36.82491	-96.73257	Osage	OK	Chaparral Energy, Inc (100%)	0	UU
	North Perryton Unit	36.4884	-100.894	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	North Shore Midstream, LLC	41.38719	-108.74324	Sweetwater	WY	Merit Energy Co, LLC (100%)	0	C,UU
	Odessa RMT	31.969907	-102.644587	Ector	TX	Occidental Petroleum Corp (100%)	0	UU
	Olive EOR Facility	31.309475	-90.552713	Amite	MS	Denbury Resources, Inc (100%)	0	UU
	Oyster Bayou EOR Facility	29.692444	-94.5065	Chambers	TX	Denbury Resources, Inc (100%)	0	UU
	PCA Gillespie 5-23A	44.291878	-86.209517	Manistee	MI	Merit Energy Co., LLC (100%)	0	UU
	PLATFORM HERMOSA	34.454167	-120.646667		CA	Anadarko Petroleum Corp (8.26%); Freeport-Mcmoran Oil & Gas LLC (69.34%); Whiting Petroleum Corp (6.07%); Koch Exploration Company, LLC (4.3%); Devon Energy (10.33%); Harvest Energy, Inc (1.7%)	0	C,UU,W
	Postle CO2 Injection	36.9049	-101.613	Texas	OK	Breitbart Energy Partners L.p. (100%)	0	UU
	Rangely CO2 Flood	40.0975111	-108.8768111	Contra Costa	CO	Chevron Corporation (68.069512%); Whiting Oil And Gas Corp (4.613916%); Arp Rangely Production LLC (25.24566%)	0	UU
	Resolute Natural Resources Company, LLC. 585 Paradox Basin	39.742905	-104.98738	Denver	CO	Resolute Natural Resources Co; Navajo Nation Oil And Gas (100%)	0	UU,W
	Riley Ridge Gas Plant	42.5011	-110.4228	Sublette	WY	Denbury Resources, Inc (100%)	0	C,PP,UU,W
	Roberts CO2 Injection Field Basin 430	32.9261999	-102.8744945		TX	Apache Corp (100%)	0	UU
	SACROC Field Injection	32.912768	-100.935494	Scurry	TX	Kinder Morgan Production Company LLC (100%)	0	UU
	SAN JUAN RIVER GAS PLANT	36.7592	-108.35967	San Juan	NM	Castleton Commodities International LLC (100%)	0	C,UU,W
	SCHAFFER COMPRESSOR STATION	35.5622	-101.1222	Carson	TX	Eagle Rock Field Services, LP (100%)	0	PP,UU
	SE BRADLEY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co, LLC (100%)	0	UU
	Salt Creek CO2 Supplier	43.4024	-104.2875	Niobrara	WY	Anadarko Petroleum Corp (77%); Linn Energy, LLC (23%)	0	UU
	Seminole East Field (SEF)	32.7337999	-102.591659	Gaines	TX		0	UU
	Seminole San Andres Unit	32.754733	-102.693432	Gaines	TX	Hess Corporation (100%)	0	UU
	Shute Creek Facility	41.8805	-110.0904	Lincoln	WY	Exxonmobil Corp (100%)	0	C,PP,UU,W
	Simpson L2-29 HD-1 GIW	44.791048	-85.060108	Kalkaska	MI	Merit Energy Co, LLC (100%)	0	UU
	Slaughter / Welch / Cedar Lake	32.85711	-102.25526	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU
	Slaughter CO2 Injection Field Basin 430	33.471926	-102.53186	Hockley	TX	Apache Corp (100%)	0	UU
	Snyder RMT	32.912768	-100.935494	Scurry	TX	Occidental Petroleum Corp (100%)	0	UU
	Soso EOR Facility	31.809704	-89.311519	Jones	MS	Denbury Resources, Inc (100%)	0	UU
	State Frederic 3-2 SWD	44.848915	-84.75335	Crawford	MI	Merit Energy Co., LLC (100%)	0	UU
	State Kalkaska 1-24F EOR	44.291878	-85.225829	Missaukee	MI	Merit Energy Co, LLC (100%)	0	UU
	Sundown CO2 Flood	33.430853	-102.491935	Hockley	TX	Chevron Corp (97.62208%); Xto Energy Inc (2.37792%)	0	UU
	TARGA VELMA GAS PROCESSING PLANT	34.4615	-97.6905	Stephens	OK	Targa Pipeline Partners, LP (100%)	0	C,PP,UU,W
	TILDEN GAS PLANT	28.409989	-98.530139	Mcmullen	TX	Regency Energy Partners LP (100%)	0	C,UU,W

## Appendix C *continued*

2014	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	Targa Midstream Services LLC - Eunice Gas Processing Plant	32.42615	-103.148564	Lea	NM	Targa Resources Corporation (100%)	0	C,PP,UU,W
	Targa Midstream Services LLC - Sandhills Gas Plant	31.501667	-102.640277	Crane	TX	Targa Resources Corporation (100%)	0	C,PP,UU,W
	Tinsley EOR Facility	32.688901	-90.616484	Yazoo	MS	Denbury Resources, Inc (100%)	0	UU
	Vacuum CO2 Flood	32.787772	-103.5103417	Contra Costa	NM	Conocophillips Co (7.60453%); Chevron Corp (59.99148%); Mobil Producing Texas & New Mexico (3.96743%); Marathon Oil Company (25.55532%); Quantum Aspect Ptp LP (1.98966%)	0	UU
	WAHA GAS PLANT	31.268888	-103.086666	Pecos	TX	Regency Energy Partners LP (100%)	0	C,UU,W
	WERTZ UNIT EOR PROJECT	42.0955	-107.0417	Carbon	WY	Merit Energy Co, LLC (100%)	0	UU
	Waha Gas Plant	31.159975	-103.104845	Pecos	TX	Enterprise Products Operating LLC (100%)	0	C,PP,UU,W
	Wasson San Andres	33.00338	-102.81901	Yoakum	TX	Occidental Petroleum Corp (100%)	0	UU
	Wellman	33.034887	-102.353829	Terry	TX	Trinity Co2, LLC (100%);	0	
	Wickett CO2 Injection	31.5269	-102.9709	Ward	TX	Whiting Petroleum Corp (100%)	0	UU
	XTO Cordona Lake Field CO2 Injection	31.31685	-102.54896	Crane	TX	Exxonmobil Corp (100%)	0	UU
	XTO Cornell Mahoney Field CO2 Injection	33.036433	-102.826353	Yoakum	TX	Exxonmobil Corp (100%)	0	UU
XTO GSAU Field CO2 Injection	31.931	-102.61742	Ector	TX	Exxonmobil Corp (100%)	0	UU	
XTO Means Field CO2 Injection	32.43775	-102.53519	Andrews	TX	Exxonmobil Corp (100%)	0	UU	
Yates Field Injection	30.927832	-102.026135	Pecos	TX	Kinder Morgan Production Company LLC (100%)	0	UU	

## Appendix C *continued*

Source: Data Extracted from EPA's FLIGHT Tool (<http://ghgdata.epa.gov/ghgp>). The data was reported to EPA by facilities as of 08/05/2017. All emissions data is presented in units of metric tons of carbon dioxide equivalent using GWP's from IPCC's AR4.

\*Note GHG Quantity under Subpart UU is considered Confidential Business Information and generally not publically disclosed.

2013	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	ARTESIA GAS PLANT	32.7564	-104.2111	Eddy	NM	Phillips 66 (50%); Spectra Energy Corp (50%)	0	C,PP,UU,W
	Adair San Andres CO2 Injection Unit - Permian Basin 430	32.963812	-102.300327	Terry	TX	Apache Corp (100%)	0	UU
	Agave Dagger Draw Gas Plant	32.71629	-104.44602	Eddy	NM	Yates Petroleum Corporation (100%)	0	C,PP,UU,W
	Albert Spicer Upper Morrow Unit	36.4725	-100.5517	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	Archer Daniels Midland Co.	39.8675	-88.885	Macon	IL	Archer Daniels Midland Co (100%)	333939	C,II,PP,UU
	BPE GPRP Grasslands Gas Plant	47.59043	-104.0005	Mckenzie	ND	Oneok Partners, L.p. (100%)	0	C,NN,PP,UU,W
	BPE GPRP Lignite Gas Plant	48.8743194	-102.5457778	Burke	ND	Oneok Partners, L.p. (100%)	0	NN,PP,UU
	Bell Creek EOR Facility	45.354589	-105.67196	Powder River	MT	Denbury Resources, Inc (100%)	0	UU
	Bonanza Creek Energy - Arkla Basin	33.310999	-93.490239	Lafayette	AR	Bonanza Creek Energy, Inc (100%)	0	UU,W
	Booker Trosper Upper Morrow Unit	36.458	-100.5462	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	Brookhaven EOR Facility	31.590472	-90.515667	Lincoln	MS	Denbury Resources, Inc (100%)	0	UU
	CONSOL Energy Inc.	39.744326	-80.519758	Marshall	WV	Consol Energy Inc (100%)	0	UU
	Camrick Unit	36.521	-100.8975	Beaver	OK	Chaparral Energy, Inc (100%)	0	UU
	Celero Energy II, LP 430 Permian Basin	31.99954	-102.07847	Midland	TX	Celero Energy II LP (100%)	0	UU,W
	Citronelle Alabama Power Project	31.077872	-88.23407	Mobile	AL	Denbury Onshore, LLC (100%)	61250	UU
	ConocoPhillips' Permian (430)	32.02786	-102.09198	Midland	TX	Conoco Phillips (100%)	0	UU,W
	Core Energy Otsego County EOR Operations	45.033842	-84.511469	Otsego	MI	Core Energy LLC (100%)	0	UU
	Cranfield EOR Facility	31.486641	-91.09694	Franklin	MS	Denbury Resources, Inc (100%)	0	UU
	Delhi EOR Facility	32.441732	-91.588175	Richland Parish	LA	Denbury Resources, Inc (100%)	0	UU
	Dilley Treating Facility	28.461253	-99.10135	La Salle	TX	Williams Partners, LP (100%)	0	
	Dollarhide CO2 Flood	32.145954	-103.048034	Andrews	TX	Chevron Corporation (61.47041%); Permian Basin Ltd Ptp (37.82824%)	0	UU
	Elk Basin Gas Plant	44.866702	-108.814934	Park	WY	Vanguard Natural Resources, LLC (100%)	0	C,NN,UU,W
	Energen Resources Corporation 430 Permian Basin	33.520058	-86.807637	Jefferson	AL	Energen Corp (100%)	0	UU,W
	Eucutta EOR Facility	31.78154	-88.82722	Wayne	MS	Denbury Resources, Inc (100%)	0	UU
	Farnsworth Unit CO2 Flood	36.2653	-101.026	Hansford	TX	Chaparral Energy, Inc (100%)	0	UU
	Fasken Oil and Ranch, Ltd. 430 Permian Basin	32.04663	-102.16955	Midland	TX	Fasken Oil And Ranch, Ltd (100%)	0	UU,W
	Goldsmith Landreth San Andres Unit Injection Facility	31.9873	-102.64999	Ector	TX	Kinder Morgan Production Company, LLC (100%)	0	UU
	Gramstorff Upper Morrow Unit	36.4689	-100.5608	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	Grieve EOR Facility	42.742331	-107.003784	Natrona	WY	Denbury Resources, Inc (100%)	0	UU
	HAMILTON DOME GAS INJECTION	43.7797	-108.5719	Hot Springs	WY	Merit Energy Co, LLC (100%)	0	UU
	Hartland 36 Injection Well 1	42.618942	-83.687829	Oakland	MI	Merit Energy Co, LLC (100%)	0	UU
	Hastings EOR Facility	29.49997	-95.24695	Brazoria	TX	Denbury Resources, Inc (100%)	0	UU
	Heidelberg EOR Facility	31.880389	-89.007389	Jasper	MS	Denbury Resources, Inc (100%)	0	UU
	Hobbs / Seminole / WCF	32.698752	-102.713512	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU
	JAL #3 GAS PLANT	32.1742	-103.1741	Lea	NM	Energy Transfer Partners, LP (100%)	0	C,UU,W
	Katz Field Injection	33.427683	-99.834815	Knox	TX	Kinder Organ Production Company LLC (100%)	0	UU
	LINAM RANCH GAS PLANT	32.6953	-103.2853	Lea	NM	Phillips 66 (50%); Spectra Energy Corp (50%)	0	C,PP,UU,W
	LOST SOLDIER UNIT EOR PROJECT	42.0955	-107.0417	Carbon	WY	Merit Energy Co, LLC (100%)	0	UU
	Lancaster Ranch Compressor Station and Treating Facility	28.726014	-99.037991	Frio	TX	Texstar Midstream Services, LP (100%)	0	C,UU,W
	Levelland / Anton CO2 FLDS	33.866995	-101.866362	Hale	TX	Occidental Petroleum Corp (100%)	0	UU
	Little Creek EOR Facility	31.34483	-90.35765	Pike	MS	Denbury Resources, Inc (100%)	0	UU
	Lockhart Crossing EOR Facility	30.519792	-90.885878	Livingston Parish	LA	Denbury Resources, Inc (100%)	0	UU
	Mabee CO2 Flood	32.2097805	-102.2279694	Contra Costa	TX	Chevron Corp (100%)	0	UU

## Appendix C *continued*

2013	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	Madison CO2 Facility	42.848253	-108.318744	Fremont	WY	Devon Energy (100%)	0	UU
	Mallalieu EOR Facility	31.493889	-90.410278	Lincoln	MS	Denbury Resources, Inc (100%)	0	UU
	Martinville EOR Facility	31.999323	-89.763408	Simpson	MS	Denbury Resources, Inc (100%)	0	UU
	Monell CO2 Supplier	41.5744	-108.5414	Sweetwater	WY	Anadarko Petroleum Corporation (100%)	0	UU
	Mountaineer (1301)	38.9794	-81.9344	Mason	WV	American Electric Power (100%)	0	C,D,PP,UU
	Murmyluk & State Lenox 3-36 GIW	42.731065	-82.732957	Macomb	MI	Merit Energy Co, LLC (100%)	0	UU
	N.W. Velma Hoxbar Unit	34.4886	-97.7126	Stephens	OK	Chaparral Energy, Inc (100%)	0	UU
	NE PURDY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co, LLC (100%)	0	UU
	North Burbank Unit	36.82491	-96.73257	Osage	OK	Chaparral Energy, Inc (100%)	0	UU
	North Perryton Unit	36.4884	-100.894	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	North Shore Midstream, LLC	41.38719	-108.74324	Sweetwater	WY	Merit Energy Co, LLC (100%)	0	C,UU
	Odessa RMT	31.969907	-102.644587	Ector	TX	Occidental Petroleum Corp (100%)	0	UU
	Olive EOR Facility	31.309475	-90.552713	Amite	MS	Denbury Resources, Inc (100%)	0	UU
	Oyster Bayou EOR Facility	29.692444	-94.5065	Chambers	TX	Denbury Resources, Inc (100%)	0	UU
	PCA Gillespie 5-23A	44.291878	-86.209517	Manistee	MI	Merit Energy Co., LLC (100%)	0	UU
	PLATFORM HERMOSA	34.454167	-120.646667		CA	Anadarko Petroleum Corp (8.26%); Freeport-Mcmoran Oil & Gas LLC (69.34%); Whiting Petroleum Corp (6.07%); Koch Exploration Company, LLC (4.3%); Devon Energy (10.33%); Harvest Energy, Inc (1.7%)	0	C,UU,W
	Postle CO2 Injection	36.9049	-101.613	Texas	OK	Breitbart Energy Partners L.p. (100%)	0	UU
	Rangely CO2 Flood	40.0975111	-108.8768111	Contra Costa	CO	Chevron Corporation (68.069512%); Whiting Oil And Gas Corp (4.613916%); Merit Energy Partners (25.24566%)	0	UU
	Resolute Natural Resources Company, LLC. 585 Paradox Basin	39.742905	-104.98738	Denver	CO	Resolute Energy Corporation (100%)	0	UU,W
	Riley Ridge Gas Plant	42.5011	-110.4228	Sublette	WY	Denbury Resources, Inc (100%)	0	C,PP,UU,W
	Roberts CO2 Injection Field Basin 430	32.9261999	-102.8744945		TX	Apache Corp (100%)	0	UU
	SACROC Field Injection	32.912768	-100.935494	Scurry	TX	Kinder Morgan Production Company LLC (100%)	0	UU
	SAN JUAN RIVER GAS PLANT	36.7592	-108.35967	San Juan	NM	Anadarko Petroleum Corporation (100%)	0	C,UU,W
	SCHAFFER COMPRESSOR STATION	35.5622	-101.1222	Carson	TX	Eagle Rock Field Services, LP (100%)	0	PP,UU
	SE BRADLEY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co, LLC (100%)	0	UU
	Salt Creek CO2 Supplier	43.4024	-104.2875	Niobrara	WY	Anadarko Petroleum Corp (100%)	0	UU
	Seminole East Field (SEF)	32.7337999	-102.591659	Gaines	TX		0	UU
	Seminole San Andres Unit	32.754733	-102.693432	Gaines	TX	Hess Corporation (100%)	0	UU
	Shute Creek Facility	41.8805	-110.0904	Lincoln	WY	Exxonmobil (100%)	0	C,PP,UU,W
	Simpson L2-29 HD-1 GIW	44.791048	-85.060108	Kalkaska	MI	Merit Energy Co, LLC (100%)	0	UU
	Slaughter / Welch / Cedar Lake	32.85711	-102.25526	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU
	Slaughter CO2 Injection Field Basin 430	33.471926	-102.53186	Hockley	TX	Apache Corp (100%)	0	UU
	Snyder RMT	32.912768	-100.935494	Scurry	TX	Occidental Petroleum Corp (100%)	0	UU
	Soso EOR Facility	31.809704	-89.311519	Jones	MS	Denbury Resources, Inc (100%)	0	UU
	State Frederic 3-2 SWD	44.848915	-84.75335	Crawford	MI	Merit Energy Co., LLC (100%)	0	UU
	State Kalkaska 1-24F EOR	44.291878	-85.225829	Missaukee	MI	Merit Energy Co, LLC (100%)	0	UU
	Sundown CO2 Flood	33.430853	-102.491935	Hockley	TX	Chevron Corp (97.62208%); Mobil Producing Texas & New Mexico (2.37792%)	0	UU
	TARGA VELMA GAS PROCESSING PLANT	34.4615	-97.6905	Stephens	OK	Atlas Pipeline Partners, LP (100%)	0	C,PP,UU,W
	TILDEN GAS PLANT	28.409989	-98.530139	Mcmullen	TX	Regency Energy Partners LP (100%)	0	C,UU,W
	Targa Midstream Services LLC - Eunice Gas Processing Plant	32.42615	-103.148564	Lea	NM	Targa Resources Corporation (100%)	0	C,PP,UU,W
	Targa Midstream Services LLC - Sandhills Gas Plant	31.501667	-102.640277	Crane	TX	Targa Resources Corporation (100%)	0	C,PP,UU,W
	Tinsley EOR Facility	32.688901	-90.616484	Yazoo	MS	Denbury Resources, Inc (100%)	0	UU



## Appendix C *continued*

2013	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	Vacuum CO2 Flood	32.787772	-103.5103417	Contra Costa	NM	Conocophillips Co (7.60453%); Chevron Corp (59.99148%); Mobil Producing Texas & New Mexico (3.96743%); Marathon Oil Company (25.55532%); Quantum Aspect Ptp LP (1.98966%)	0	UU
	WAHA GAS PLANT	31.268888	-103.086666	Pecos	TX	Regency Energy Partners LP (100%)	0	C,UU,W
	WERTZ UNIT EOR PROJECT	42.0955	-107.0417	Carbon	WY	Merit Energy Co, LLC (100%)	0	UU
	Waha Gas Plant	31.159975	-103.104845	Pecos	TX	Enterprise Products Operating LLC (100%)	0	C,PP,UU,W
	Wasson San Andres	33.00338	-102.81901	Yoakum	TX	Occidental Petroleum Corp (100%)	0	UU
	Wellman	33.034887	-102.353829	Terry	TX	Trinity Co2, LLC (100%)	0	UU
	Wickett CO2 Injection	31.5269	-102.9709	Ward	TX	Whiting Petroleum Corp (100%)	0	UU
	XTO Cordona Lake Field CO2 Injection	31.31685	-102.54896	Crane	TX	Exxonmobil Corporation (100%)	0	UU
	XTO Cornell Mahoney Field CO2 Injection	33.036433	-102.826353	Yoakum	TX	Exxonmobil Corporation (100%)	0	UU
	XTO GSAU Field CO2 Injection	31.931	-102.61742	Ector	TX	Exxonmobil Corporation (100%)	0	UU
XTO Means Field CO2 Injection	32.43775	-102.53519	Andrews	TX	Exxonmobil Corporation (100%)	0	UU	
Yates Field Injection	30.927832	-102.026135	Pecos	TX	Kinder Morgan Production Company LLC (100%)	0	UU	

## Appendix C *continued*

Source: Data Extracted from EPA's FLIGHT Tool (<http://ghgdata.epa.gov/ghgp>). The data was reported to EPA by facilities as of 08/05/2017. All emissions data is presented in units of metric tons of carbon dioxide equivalent using GWP's from IPCC's AR4.

\*Note GHG Quantity under Subpart UU is considered Confidential Business Information and generally not publically disclosed.

2012	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	ARTESIA GAS PLANT	32.7564	-104.2111	Eddy	NM	Phillips 66 (50%); Spectra Energy Corp (50%)	0	C,PP,UU,W
	Adair San Andres CO2 Injection Unit - Permian Basin 430	29.77	-95.37		TX	Apache Corp (100%)	0	UU
	Agave Dagger Draw Gas Plant	32.71629	-104.44602	Eddy	NM	Yates Petroleum Corporation (100%)	0	PP,UU
	Albert Spicer Upper Morrow Unit	36.4725	-100.5517	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	Archer Daniels Midland Co.	39.8675	-88.885	Macon	IL	Archer Daniels Midland Co (100%)	326482	C,II,PP,UU
	BPE GPRP Grasslands Gas Plant	47.59043	-104.0005	Mckenzie	ND	Oneok Partners, L.p. (100%)	0	C,NN,PP,UU,W
	BPE GPRP Lignite Gas Plant	48.8743194	-102.5457778	Burke	ND	Oneok Partners, L.p. (100%)	0	NN,PP,UU
	Bonanza Creek Energy - Arkla Basin	33.310999	-93.490239	Lafayette	AR	Bonanza Creek Energy, Inc (100%)	0	UU,W
	Booker Trosper Upper Morrow Unit	36.458	-100.5462	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	Brookhaven EOR Facility	31.590472	-90.515667	Lincoln	MS	Denbury Resources, Inc (100%)	0	UU
	CONSOL Energy Inc.	39.744326	-80.519758	Marshall	WV	Consol Energy Inc (100%)	0	UU
	Camrick Unit	36.521	-100.8975	Beaver	OK	Chaparral Energy, Inc (100%)	0	UU
	Celero Energy II, LP 430 Permian Basin	31.99954	-102.07847	Midland	TX	Celero Energy II LP (100%)	0	UU,W
	Citronelle Alabama Power Project	31.077872	-88.23407	Mobile	AL	Denbury Onshore, LLC (100%)	40368	UU
	ConocoPhillips' Permian (430)	32.02786	-102.09198	Midland	TX	Conoco Phillips (100%)	0	UU,W
	Core Energy Otsego County EOR Operations	45.033842	-84.511469	Otsego	MI	Core Energy LLC (100%)	0	UU
	Cranfield EOR Facility	31.486641	-91.09694	Franklin	MS	Denbury Resources, Inc (100%)	0	UU
	Delhi EOR Facility	32.441732	-91.588175	Richland Parish	LA	Denbury Resources, Inc (100%)	0	UU
	Dollarhide CO2 Flood	32.145954	-103.048034	Andrews	TX	Permian Basin Ltd Ptp (50.74527%); Chevron Corporation (48.74736%)	0	UU
	Elk Basin Gas Plant	44.866702	-108.814934	Park	WY	Vanguard Natural Resources, LLC (100%)	0	C,NN,UU,W
	Energen Resources Corporation 430 Permian Basin	33.520058	-86.807637	Jefferson	AL	Energen Corp (100%)	0	UU,W
	Eucutta EOR Facility	31.78154	-88.82722	Wayne	MS	Denbury Resources, Inc (100%)	0	UU
	Farnsworth Unit CO2 Flood	36.2653	-101.026	Hansford	TX	Chaparral Energy, Inc (100%)	0	UU
	Fasken Oil and Ranch, Ltd. 430 Permian Basin	32.04663	-102.16955	Midland	TX	Fasken Oil And Ranch, Ltd (100%)	0	UU,W
	Gramstorff Upper Morrow Unit	36.4689	-100.5608	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	HAMILTON DOME GAS INJECTION	43.7797	-108.5719	Hot Springs	WY	Merit Energy Co, LLC (100%)	0	UU
	Hartland 36 Injection Well 1	42.618942	-83.687829	Oakland	MI	Merit Energy Co, LLC (100%)	0	UU
	Hastings EOR Facility	29.49997	-95.24695	Brazoria	TX	Denbury Resources, Inc (100%)	0	UU
	Heidelberg EOR Facility	31.880389	-89.007389	Jasper	MS	Denbury Resources, Inc (100%)	0	UU
	Hobbs / Seminole / WCF	32.698752	-102.713512	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU
	JAL #3 GAS PLANT	32.1742	-103.1741	Lea	NM	Energy Transfer Partners, LP (100%)	0	C,UU,W
	Katz Field Injection	33.427683	-99.834815	Knox	TX	Kinder Organ Production Company LLC (100%)	0	UU
	LINAM RANCH GAS PLANT	32.6953	-103.2853	Lea	NM	Phillips 66 (50%); Spectra Energy Corp (50%)	0	C,PP,UU,W
	LOST SOLDIER UNIT EOR PROJECT	42.0955	-107.0417	Carbon	WY	Merit Energy Co, LLC (100%)	0	UU
	Levelland / Anton CO2 FLDS	33.866995	-101.866362	Hale	TX	Occidental Petroleum Corp (100%)	0	UU
	Little Creek EOR Facility	31.34483	-90.35765	Pike	MS	Denbury Resources, Inc (100%)	0	UU
	Lockhart Crossing EOR Facility	30.5484273	-90.810357		LA	Denbury Resources, Inc (100%)	0	UU
	Mabee CO2 Flood	32.2097805	-102.2279694	Contra Costa	TX	Chevron Corp (100%)	0	UU
	Madison CO2 Facility	42.848253	-108.318744	FREMONT	WY		0	UU
	Mallalieu EOR Facility	31.493889	-90.410278	LINCOLN	MS	Denbury Resources, Inc (100%)	0	UU
	Martinville EOR Facility	31.999323	-89.763408	Simpson	MS	Denbury Resources, Inc (100%)	0	UU
	Monell CO2 Supplier	41.5744	-108.5414	Sweetwater	WY	Anadarko Petroleum Corp (100%)	0	UU
	Mountaineer (1301)	38.9794	-81.9344	Mason	WV	American Electric Power (100%)	0	C,D,PP,UU
	Murmyluk & State Lenox 3-36 GIW	42.731065	-82.732957	Macomb	MI	Merit Energy Co, LLC (100%)	0	UU
	N.W. Velma Hoxbar Unit	34.4886	-97.7126	Stephens	OK	Chaparral Energy, Inc (100%)	0	UU

Appendix C continued

2012	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	NE PURDY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co, LLC (100%)	0	UU
	North Perryton Unit	36.4884	-100.894	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	North Shore Midstream, LLC	41.38719	-108.74324	Sweetwater	WY	Merit Energy Co, LLC (100%)	0	C,UU
	Odessa RMT	31.969907	-102.644587	Ector	TX	Occidental Petroleum Corp (100%)	0	UU
	Olive EOR Facility	31.309475	-90.552713	Amite	MS	Denbury Resources, Inc (100%)	0	UU
	Oyster Bayou EOR Facility	29.692444	-94.5065	Chambers	TX	Denbury Resources, Inc (100%)	0	UU
	PCA Gillespie 5-23A	44.291878	-86.209517	Manistee	MI	Merit Energy Co., LLC (100%)	0	UU
	PLATFORM HERMOSA	34.454167	-120.646667		CA	Anadarko Petroleum Corp (8.26%); Plains Exploration & Production Co (69.34%); Whiting Petroleum Corp (6.07%); Koch Exploration Company, LLC (4.3%); Devon Energy (10.33%); Harvest Energy, Inc (1.7%)	0	C,UU,W
	Postle CO2 Injection	36.9049	-101.613	Texas	OK	Whiting Petroleum Corp (100%)	0	UU
	Rangely CO2 Flood	40.0975111	-108.8768111	Contra Costa	CO	Chevron Corporation (68.069512%); Whiting Oil And Gas Corp (4.613916%); Merit Energy Partners (25.24566%)	0	UU
	Resolute Natural Resources Company, LLC. 585 Paradox Basin	39.742905	-104.98738	Denver	CO	Resolute Energy Corporation (100%)	0	UU,W
	SACROC Field Injection	32.912768	-100.935494	Scurry	TX	Kinder Morgan Production Co. LLC (100%)	0	UU
	SAN JUAN RIVER GAS PLANT	36.7592	-108.35967	San Juan	NM	Anadarko Petroleum Corporation (100%)	0	C,UU,W
	SCHAFFER COMPRESSOR STATION	35.5622	-101.1222	Carson	TX	Eagle Rock Field Services, LP (100%)	0	PP,UU
	SE BRADLEY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co, LLC (100%)	0	UU
	Salt Creek CO2 Supplier	43.4024	-104.2875	Niobrara	WY	Anadarko Petroleum Corp (100%)	0	UU
	Seminole San Andres Unit	32.754733	-102.693432	Gaines	TX	Hess Corporation (100%)	0	UU
	Shute Creek Facility	41.8805	-110.0904	Lincoln	WY	Exxonmobil (100%)	0	C,PP,UU,W
	Simpson L2-29 HD-1 GIW	44.791048	-85.060108	Kalkaska	MI	Merit Energy Co, LLC (100%)	0	UU
	Slaughter / Welch / Cedar Lake	32.85711	-102.25526	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU
	Slaughter CO2 Injection Field Basin 430	33.471926	-102.53186	Hockley	TX	Apache Corp (100%)	0	UU
	Snyder RMT	32.912768	-100.935494	Scurry	TX	Occidental Petroleum Corp (100%)	0	UU
	Soso EOR Facility	31.809704	-89.311519	Jones	MS	Denbury Resources, Inc (100%)	0	UU
	State Frederic 3-2 SWD	44.848915	-84.75335	Crawford	MI	Merit Energy Co., LLC (100%)	0	UU
	State Kalkaska 1-24F EOR	44.291878	-85.225829	Missaukee	MI	Merit Energy Co, LLC (100%)	0	UU
	Sundown CO2 Flood	33.430853	-102.491935	Hockley	TX	Chevron Corp (97.62208%); Mobil Producing Texas & New Mexico (2.37792%)	0	UU
	Targa Velma Gas Processing Plant	34.4615	-97.6905	Stephens	OK	Atlas Pipeline Partners, LP (100%)	0	C,PP,UU,W
	TILDEN GAS PLANT	28.409989	-98.530139	Mcmullen	TX	Regency Energy Partners LP (100%)	0	C,UU,W
	Targa Midstream Services LLC - Eunice Gas Processing Plant	32.42615	-103.148564	Lea	NM	Targa Resources Corporation (100%)	0	C,PP,UU,W
	Targa Midstream Services LLC - Sandhills Gas Plant	31.501667	-102.640277	Crane	TX	Targa Resources Corporation (100%)	0	C,PP,UU,W
	Tinsley EOR Facility	32.688901	-90.616484	Yazoo	MS	Denbury Resources, Inc (100%)	0	UU
	Vacuum CO2 Flood	32.787772	-103.5103417	Contra Costa	NM	Chevron Corp (83.19642%); Conocophillips Co (3.1939026%); Marathon Oil Company (10.7332344%); Mobil Producing Texas & New Mexico (1.6663206%)	0	UU
	WAHA GAS PLANT	31.268888	-103.086666	Pecos	TX	Regency Energy Partners LP (100%)	0	C,UU,W
	WERTZ UNIT EOR PROJECT	42.0955	-107.0417	Carbon	WY	Merit Energy Co, LLC (100%)	0	UU
	Waha Gas Plant	31.159975	-103.104845	Pecos	TX	Enterprise Products Operating LLC (100%)	0	C,PP,UU,W
	Wasson San Andres	33.00338	-102.81901	Yoakum	TX	Occidental Petroleum Corp (100%)	0	UU
	Wellman	33.034887	-102.353829	Terry	TX	Trinity Co2, LLC (100%)	0	UU
	Wickett CO2 Injection	31.5269	-102.9709	Ward	TX	Whiting Petroleum Corp (100%)	0	UU
	XTO Cordona Lake Field CO2 Injection	31.31685	-102.54896	Crane	TX	Exxonmobil Corporation (100%)	0	UU
	XTO Cornell Mahoney Field CO2 Injection	33.036433	-102.826353	Yoakum	TX	Exxonmobil Corporation (100%)	0	UU
	XTO GSAU Field CO2 Injection	31.931	-102.61742	Ector	TX	Exxonmobil Corporation (100%)	0	UU
	XTO Means Field CO2 Injection	32.43775	-102.53519	Andrews	TX	Exxonmobil Corporation (100%)	0	UU
	Yates Field Injection	30.927832	-102.026135	Pecos	TX	Kinder Morgan Production Company LLC (100%)	0	UU

## Appendix C *continued*

Source: Data Extracted from EPA's FLIGHT Tool (<http://ghgdata.epa.gov/ghgp>). The data was reported to EPA by facilities as of 08/05/2017. All emissions data is presented in units of metric tons of carbon dioxide equivalent using GWP's from IPCC's AR4.

\*Note GHG Quantity under Subpart UU is considered Confidential Business Information and generally not publically disclosed.

2011	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	ARTESIA GAS PLANT	32.7564	-104.2111	Eddy	NM	Conoco Phillips (50%); Spectra Energy Corp (50%)	0	C,PP,UU,W
	Adair San Andres CO2 Injection Unit - Permian Basin 430	29.77	-95.37		TX	Apache Corp (100%)	0	UU
	Albert Spicer Upper Morrow Unit	36.4725	-100.5517	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	Archer Daniels Midland Co.	39.8675	-88.885	Macon	IL	Archer Daniels Midland Co (100%)	34027	C,II,PP,UU
	BPE GPRP Grasslands Gas Plant	47.59043	-104.0005	McKenzie	ND	Oneok Partners, L.p. (100%)	0	C,NN,PP,UU,W
	BPE GPRP Lignite Gas Plant	48.8743194	-102.5457778	Burke	ND	Oneok Partners, L.p. (100%)	0	NN,PP,UU
	Bonanza Creek Energy - Arkla Basin	33.310999	-93.490239	Lafayette	AR	Bonanza Creek Energy, Inc (100%)	0	UU,W
	Booker Trosper Upper Morrow Unit	36.458	-100.5462	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU
	Brookhaven EOR Facility	31.590472	-90.515667	Lincoln	MS	Denbury Resources, Inc (100%)	0	UU
CONSOL Energy Inc.	39.744326	-80.519758	Marshall	WV	Consol Energy Inc (100%)	0	UU	
Camrick Unit	36.521	-100.8975	Beaver	OK	Chaparral Energy, Inc (100%)	0	UU	
Chevron MCA 430 Permian Basin	37.76205	-121.95817	Contra Costa	CA	Chevron Corp (100%)	0	UU,W	
Chevron MCA 595 Piceance Basin	37.76205	-121.95817	Contra Costa	CA	Chevron Corp (100%)	0	UU,W	
ConocoPhillips' Permian (430)	32.02786	-102.09198	Midland	TX	Conoco Phillips (100%)	0	UU,W	
Core Energy Otsego County EOR Operations	45.033842	-84.511469	Otsego	MI	Core Energy LLC (100%)	0	UU	
Cranfield EOR Facility	31.486641	-91.09694	Franklin	MS	Denbury Resources, Inc (100%)	0	UU	
Delhi EOR Facility	32.441732	-91.588175	Richland Parish	LA	Denbury Resources, Inc (100%)	0	UU	
Elk Basin Gas Plant	44.866702	-108.814934	Park	WY	Vanguard Natural Resources, LLC (100%)	0	C,NN,UU,W	
Energen Resources Corporation 430 Permian Basin	33.520058	-86.807637	Jefferson	AL	Energen Corp (100%)	0	UU,W	
Eucutta EOR Facility	31.78154	-88.82722	Wayne	MS	Denbury Resources, Inc (100%)	0	UU	
Farnsworth Unit CO2 Flood	36.2653	-101.026	Hansford	TX	Chaparral Energy, Inc (100%)	0	UU	
Fasken Oil and Ranch, Ltd. 430 Permian Basin	32.04663	-102.16955	Midland	TX	Fasken Oil And Ranch, Ltd (100%)	0	UU,W	
Gramstorff Upper Morrow Unit	36.4689	-100.5608	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU	
HAMILTON DOME GAS INJECTION	43.7797	-108.5719	Hot Springs	WY	Merit Energy Co, LLC (100%)	0	UU	
Hartland 36 Injection Well 1	42.618942	-83.687829	Oakland	MI	Merit Energy Co, LLC (100%)	0	UU	
Hastings EOR Facility	29.49997	-95.24695	Brazoria	TX	Denbury Resources, Inc (100%)	0	UU	
Heidelberg EOR Facility	31.880389	-89.007389	Jasper	MS	Denbury Resources, Inc (100%)	0	UU	
Hobbs / Seminole / WCF	32.698752	-102.713512	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU	
JAL #3 GAS PLANT	32.1742	-103.1741	Lea	NM	Southern Union Gas Services (100%)	0	C,UU,W	
Katz Field Injection	33.427683	-99.834815	Knox	TX	Kinder Organ Production Company LLC (100%)	0	UU	
LINAM RANCH GAS PLANT	32.6953	-103.2853	Lea	NM	Conoco Phillips (50%); Spectra Energy Corp (50%)	0	C,PP,UU,W	
LOST SOLDIER UNIT EOR PROJECT	42.0955	-107.0417	Carbon	WY	Merit Energy Co, LLC (100%)	0	UU	
Levelland / Anton CO2 FLDS	33.866995	-101.866362	Hale	TX	Occidental Petroleum Corp (100%)	0	UU	
Little Creek EOR Facility	31.34483	-90.35765	Pike	MS	Denbury Resources, Inc (100%)	0	UU	
Lockhart Crossing EOR Facility	30.5484273	-90.810357		LA	Denbury Resources, Inc (100%)	0	UU	
Madison CO2 Facility	42.848253	-108.318744	Fremont	WY		0	UU	
Mallalieu EOR Facility	31.493889	-90.410278	Lincoln	MS	Denbury Resources, Inc (100%)	0	UU	
Martinville EOR Facility	31.999323	-89.763408	Simpson	MS	Denbury Resources, Inc (100%)	0	UU	
Monell CO2 Supplier	41.5744	-108.5414	Sweetwater	WY	Anadarko Petroleum Corp (100%)	0	UU	
Mountaineer (1301)	38.9794	-81.9344	Mason	WV	American Electric Power (100%)	22276	C,D,PP,UU	
Murmyluk & State Lenox 3-36 GIW	42.731065	-82.732957	Macomb	MI	Merit Energy Co, LLC (100%)	0	UU	
N.W. Velma Hoxbar Unit	34.4886	-97.7126	Stephens	OK	Chaparral Energy, Inc (100%)	0	UU	
NE PURDY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co, LLC (100%)	0	UU	
North Perryton Unit	36.4884	-100.894	Ochiltree	TX	Chaparral Energy, Inc (100%)	0	UU	

**Appendix C** *continued*

2011	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	North Shore Midstream, LLC	41.38719	-108.74324	Sweetwater	WY	Merit Energy Co, LLC (100%)	0	C,UU
Odessa RMT	31.969907	-102.644587	Ector	TX	Occidental Petroleum Corp (100%)	0	UU	
Olive EOR Facility	31.309475	-90.552713	Amite County	MS	Denbury Resources, Inc (100%)	0	UU	
Oyster Bayou EOR Facility	29.692444	-94.5065	Chambers	TX	Denbury Resources, Inc (100%)	0	UU	
PCA Gillespie 5-23A	44.291878	-86.209517	Manistee	MI	Merit Energy Co., LLC (100%)	0	UU	
PLATFORM HERMOSA	34.454167	-120.646667		CA	Anadarko Petroleum Corp (8.26%); Plains Exploration & Production Co (69.34%); Whiting Petroleum Corp (6.07%); Koch Exploration Company, LLC (4.3%); Devon Energy (10.33%); Harvest Energy, Inc (1.7%)	0	C,UU,W	
Postle CO2 Injection	36.9049	-101.613	Texas	OK	Whiting Petroleum Corp (100%)	0	UU	
Resolute Natural Resources Company, LLC. 585 Paradox Basin	39.742905	-104.98738	Denver	CO	Resolute Energy Corporation (100%)	0	UU,W	
SACROC Field Injection	32.912768	-100.935494	Scurry	TX	Kinder Morgan Production Company LLC (100%)	0	UU	
SAN JUAN RIVER GAS PLANT	36.7592	-108.35967	San Juan	NM	Anadarko Petroleum Corp (100%)	0	C,UU,W	
SCHAFFER COMPRESSOR STATION	35.5622	-101.1222	Carson	TX	Eagle Rock Field Services, LP (100%)	0	PP,UU	
SE BRADLEY UNIT EOR PROJECT	36.9067	-101.6166	Texas	OK	Merit Energy Co, LLC (100%)	0	UU	
Salt Creek CO2 Supplier	43.4024	-104.2875	Niobrara	WY	Anadarko Petroleum Corp (100%)	0	UU	
Seminole San Andres Unit	32.754733	-102.693432	Gaines	TX	Hess Corporation (100%)	0	UU	
Shute Creek Facility	41.8805	-110.0904	Lincoln	WY	Exxonmobil (100%)	0	C,PP,UU,W	
Simpson L2-29 HD-1 GIW	44.791048	-85.060108	Kalkaska	MI	Merit Energy Co, LLC (100%)	0	UU	
Slaughter / Welch / Cedar Lake	32.85711	-102.25526	Gaines	TX	Occidental Petroleum Corp (100%)	0	UU	
Slaughter CO2 Injection Field Basin 430	33.471926	-102.53186	Hockley	TX	Apache Corp (100%)	0	UU	
Snyder RMT	32.912768	-100.935494	Scurry	TX	Occidental Petroleum Corp (100%)	0	UU	
Soso EOR Facility	31.809704	-89.311519	Jones	MS	Denbury Resources, Inc (100%)	0	UU	
State Frederic 3-2 SWD	44.848915	-84.75335	Crawford	MI	Merit Energy Co., LLC (100%)	0	UU	
State Kalkaska 1-24F EOR	44.291878	-85.225829	Missaukee	MI	Merit Energy Co, LLC (100%)	0	UU	
TILDEN GAS PLANT	28.409989	-98.530139	Mcmullen	TX	Regency Energy Partners LP (100%)	0	C,UU,W	
Targa Midstream Services LLC - Eunice Gas Processing Plant	32.42615	-103.148564	Lea	NM	Targa Resources Corporation (100%)	0	C,PP,UU,W	
Targa Midstream Services LLC - Sandhills Gas Plant	31.501667	-102.640277	Crane	TX	Targa Resources Corporation (100%)	0	C,PP,UU,W	
Tinsley EOR Facility	32.688901	-90.616484	Yazoo	MS	Denbury Resources, Inc (100%)	0	UU	
WAHA GAS PLANT	31.268888	-103.086666	Pecos	TX	Regency Energy Partners LP (100%)	0	C,UU,W	
WERTZ UNIT EOR PROJECT	42.0955	-107.0417	Carbon	WY	Merit Energy Co, LLC (100%)	0	UU	
Waha Gas Plant	31.159975	-103.104845	Pecos	TX	Enterprise Products Operating LLC (100%)	0	C,PP,UU,W	
Wasson San Andres	33.00338	-102.81901	Yoakum	TX	Occidental Petroleum Corp (100%)	0	UU	
Wellman	33.034887	-102.353829	Terry	TX	Sandridge Energy, Inc (100%)	0	UU	
Wickett CO2 Injection	31.5269	-102.9709	Ward	TX	Whiting Petroleum Corp (100%)	0	UU	
XTO Cordona Lake Field CO2 Injection	31.31685	-102.54896	Crane	TX	Exxonmobil Corporation (100%)	0	UU	
XTO Cornell Mahoney Field CO2 Injection	33.036433	-102.826353	Yoakum	TX	Exxonmobil Corporation (100%)	0	UU	
XTO GSAU Field CO2 Injection	31.931	-102.61742	Ector	TX	Exxonmobil Corporation (100%)	0	UU	
XTO Means Field CO2 Injection	32.43775	-102.53519	Andrews	TX	Exxonmobil Corporation (100%)	0	UU	
Yates Field Injection	30.927832	-102.026135	Pecos	TX	Kinder Morgan Production Company LLC (100%)	0	UU	



## Appendix C

### EPA GHG Reporting Under Subpart RR

*Source:* Data Extracted from EPA's FLIGHT Tool (<http://ghgdata.epa.gov/ghgp>). The data was reported to EPA by facilities as of 08/05/2017. All emissions data is presented in units of metric tons of carbon dioxide equivalent using GWP's from IPCC's AR4.

2016	Facility Name	Latitude	Longitude	County Name	State	Parent Companies	GHG Qty MT CO <sub>2</sub> e	Subparts
	Denver Unit	33.00338	-102.81901	Yoakum	TX	Occidental Petroleum Corp (53.03%); Chevron Corp (15.7%); Conocophillips (15.7%); Exxonmobil Corp (15.57%)	3100370	RR (RPT)

## Appendix D

Source: OpenSecrets.org, <https://www.opensecrets.org/lobby/billsum.php?id=s1663-115>.

### S.1663

- [Summary](#)
- [Sponsors](#)
- [Lobbyists](#)

## Clients lobbying on S.1663: CO2 Regulatory Certainty Act

2 unique organization(s) has/have registered to lobby on this bill. Click on a client's name to view all the bills on which they reported lobbying. Click on the number of reports to view all the client's reports that mentioned this bill. Moving to the Sponsors tab (above) will show you the members of Congress who sponsored this legislation.

NOTE: Occasionally, a lobbying client may refer to a bill number from a previous Congress, either in error or because they are lobbying on a bill that has not yet been assigned a number. [Read more...](#)

Client	Year	No. of Reports & Specific Issues*
<a href="#">Denbury Resources</a>	2017	<a href="#">2</a>
<a href="#">Exxon Mobil</a>	2017	<a href="#">2</a>

Search database by:

## Appendix D

Source: OpenSecrets.org, <https://www.opensecrets.org/lobby/billsum.php?id=s1663-115>.

### Lobbyists lobbying on S.1663: CO2 Regulatory Certainty Act

NOTE: Occasionally, a lobbying client may refer to a bill number from a previous Congress, either in error or because they are lobbying on a bill that has not yet been assigned a number. [Read more...](#)

Display  ▼

LOBBYIST	REGISTRANT	NO. OF REPORTS & SPECIFIC ISSUES*
Easley, Daniel	Exxon Mobil	2
Jacobson, Jack N	Hogan Lovells	2
Linker, Jennifer	Exxon Mobil	1
McCoy, Keith	Exxon Mobil	2
Mitchell, JO	Exxon Mobil	2
Raymond, Tim	Exxon Mobil	2
Simpson, C Kyle	Hogan Lovells	2
Walton, Gantt	Exxon Mobil	1
Wickett, James M	Hogan Lovells	2

Showing 1 to 9 of 9 entries

*Spring 2018*



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