

**EPA’S FINAL RULE ON MANDATORY GREENHOUSE GAS REPORTING:
WHAT DOES IT SAY; WHAT DOES IT MEAN: AND WHAT COMES NEXT?**

**A REPORT TO THE TEXAS CARBON CAPTURE AND STORAGE ASSOCIATION
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I. EXECUTIVE SUMMARY

EPA has issued a final rule mandating the reporting of emissions of six greenhouse gases (“GHG”), including CO₂ (the “*Final Rule*”). Reporting will be required of a large number of entities based on differing methodologies depending on the industry in which the entity conducts operations. This report discusses the impact of the rule on suppliers of CO₂ (i.e. the provisions contained in “*Subpart PP*” of the new rule at 40 CFR §§ 98.420 through 98.428). In short, the final rule requires suppliers to report the mass of CO₂ captured, extracted, imported or exported and requires reporting information on the end use of such CO₂ supplies “if known”, but does not require reporting of injections, transportation or any CO₂ activities “downstream” of the production stage. Together with the pending UIC rulemaking expected to be completed next year, the *Final Rule* on CO₂ reporting lays the predicate for EPA’s next step in this area, the “geologic sequestration rule” under the Clean Air Act for which rulemaking proceedings are expected to commence in the relatively near future.

The *Final Rule* requires regulated companies to begin measuring emissions *effective January 1, 2010* with the first report due to be filed with the EPA *on or before March 31, 2011*.¹

The *Final Rule* is one part of a multi-pronged approach by the Obama Administration designed on both a stand-alone basis as well as a tactical maneuver to push Congress to enact comprehensive carbon regulation legislation.

**II. “WHO, WHEN AND WHAT”:
A QUICK SUMMARY OF THE NEW REQUIREMENTS**

On September 22, 2009, the Environmental Protection Agency (EPA) issued its final rule adopting nationwide reporting for certain greenhouse gas emissions. (EPA-HQ-OAR-

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¹ 40 CFR § 98.3 (b).

2008-0508), 74 Fed. Reg. 56260 (October 30, 2009)². The rule contains general provisions that are applicable to all covered entities and a series of provisions that are tailored to specific industries. The entry page to EPA's entire set of documents including the preamble and the actual regulatory text as published in September (1300-plus pages) as well various supporting documents is located at:

<http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>.

The Federal Register version of the Final Rule (including preamble and regulatory text in small print, reduced to 261 printed pages) is located at:

<http://edocket.access.gpo.gov/2009/pdf/E9-23315.pdf>

Note also that some of the important aspects of what the rule means and where EPA is headed are included in the approximately three dozen volumes of responses to comments. Of particular relevance is Volume 41 of the responses, where EPA responds to commenters on the proposed Subpart PP rules.³ Short excerpts from the relevant documents are appended here as follows:

Appendix A contains excerpts from the "preamble" to the final rule, i.e. EPA's narrative discussion of those portions of the new rules that apply to producers or suppliers of CO₂;

Appendix B contains the actual regulatory text of Subpart PP of the new rules applicable to "Suppliers of CO₂" (to be codified at 40 CFR §§ 98.1 to 98.9 and §§98.420 to 98.428); and

Appendix C contains select excerpts from EPA's responses to comments on Subpart PP.

A. *Who must report: coverage of the new rules:* The new rules apply to dozens of categories of entities of both "emitters" and "suppliers" of GHG. The bulk of the public discussion of the new rule relates to emitters of GHGs. But for purposes of carbon capture and storage issues, it is important to focus also on the "suppliers" of CO₂, as detailed below. Association Members will of course need to review the applicability of

² The effective date of the new rule is December 29, 2009, 60 days after publication in the Federal Register.

³ The direct link to Volume 41 of the comment responses is found at:

<http://www.epa.gov/climatechange/emissions/downloads09/documents/SubpartPP-SuppliersofCarbonDioxide.pdf> (viewed October 12, 2009).

Note that the Federal Register version of the Final Rule does not include the detailed summary of public comments with EPA's "point by point" response. These are in separate PDF files available from the EPA's site referenced in the text above.

the new rules on all aspects of their businesses and may need to consult multiple subparts to find the detailed provisions which apply.⁴

Supplier reporting. The rule specifies certain activities that are included and then specifically excludes certain other common CO₂-related activities. In essence, the rule is focused here on the *upstream supply* of CO₂, *not on its transportation, distribution or injection for EOR activities.*

Who is included: Under § 98.2 (a) the reporting rules impose the applicable reporting, monitoring, and recordkeeping requirements on “any supplier” that meets the requirements of § 98.2 (a) (4), which in turn applies to a supplier that provides certain listed products and includes “carbon dioxide suppliers”,⁵ which term is further defined to include “all producers of CO₂”,⁶ as well as certain importers and exporters of CO₂.⁷ The preamble to the rule says that the term “supplied” means “*produced, imported or exported*”. *Final Rule*, at 36, n. 7.

These terms are also further defined in the Subpart PP regulations which define the “carbon dioxide (CO₂) supplier source category” in more detail. Under § 98.420 (a), the CO₂ Supplier source category includes:

- “facilities” with *production process units that capture* a CO₂ stream for *purposes of supplying CO₂ for commercial applications or that capture*

⁴ For example, among the separate “source categories” in addition to producers of CO₂ for which separate rules apply are the following:

- *Coal-based liquid fuels:* All producers of coal-to-liquid fuels; importers and exporters of coal-to-liquid fuels with annual imports or annual exports that are equivalent to 25,000 metric tons CO₂e or more per year. See Subpart LL.
- *Industrial GHGs:* All producers of industrial GHGs; importers and exporters of industrial GHGs with annual bulk imports or exports of N₂O, fluorinated GHGs, and CO₂ that in combination are equivalent to 25,000 metric tons CO₂e or more per year. (Subpart OO).
- *Importers and exporters of CO₂:* Importers and exporters of CO₂ are treated in the same source category as producers of CO₂ if they have annual bulk imports or exports of N₂O, fluorinated and CO₂ that in combination are equivalent to 25,000 metric tons CO₂e or more per year.
- *Petroleum products:* All petroleum refiners that distill crude oil; importers and exporters of petroleum products with annual imports or annual exports that are equivalent to 25,000 metric tons CO₂e or more per year (Subpart MM); and
- *Natural gas and natural gas liquids (NGLs):* All natural gas fractionators and all local natural gas distribution companies (LDCs). (Subpart NN)

Companies may need to review other source categories as well.

⁵ 40 CFR § 98.2 (a) (4) (v).

⁶ 40 CFR § 98.2 (a) (4) (v) (A).

⁷ See 40 CFR §§ 98.2 (a) (4) (v) (B) (importers) and (C) (exporters).

and maintain custody of a CO₂ stream “in order to sequester or otherwise inject it underground” (here the term “capture” is effectively defined as referring to “the initial separation and removal of CO₂ from a manufacturing process or any other process”);⁸

- “facilities” with *CO₂ production wells* that “extract or produce a CO₂ stream for purposes of supplying CO₂ for commercial applications or that extract and main custody of a CO₂ stream in order to sequester or otherwise inject it underground”;⁹
- importers or exporters of bulk CO₂; ¹⁰

Who is excluded: Equally important as the included CO₂ operations are those operations that are *excluded* from the source category definition. Hence, the *Final Rule* states that the source category is “focused on upstream supply” and *excludes the actual use of CO₂ in EOR, the transportation or distribution of CO₂ and the storage of CO₂ either above ground or in geologic formations.* ¹¹ The rule also excludes CO₂ that is imported or exported “in equipment, such as fire extinguishers”.

Volumetric thresholds for other source categories and the “once in, always in” rule, with 3 and 5 years exceptions. For CO₂ producers or suppliers, *all* suppliers in the source category must report. However, for certain other source categories (including the importer/exporter category as well as many of the other industrial source categories), there are volumetric thresholds. Once subject to the reporting rule, reporters must continue to submit GHG reports annually, even if their emissions fall below the otherwise applicable reporting threshold, unless their emissions are either (1) less than 25,000 metric tons of CO₂e per year for five consecutive years or (2) less than 15,000 metric tons of CO₂e per year for three consecutive years.¹² Special notification and record-keeping rules apply in these cases.¹³

⁸ § 98.420 (a) (1). (All further section references are to the regulations to be codified in volume 40, CFR.)

⁹ § 98.420 (a) (2).

¹⁰ § 98.420 (a) (3).

¹¹ § 98.420 (b). The regulatory text for the exclusions reads as follows.

“This source category is focused on upstream supply. It does not cover:

- (1) Storage of CO₂ above ground or in geologic formations.
- (2) Use of CO₂ in enhanced oil and gas recovery.
- (3) Transportation or distribution of CO₂.
- (4) Purification, compression, or processing of CO₂.
- (5) On-site use of CO₂ captured on site.”

¹² Reporting Rule, at 37-38.

¹³ *Id.*, at 38-39.

B. When does reporting take effect: effective dates.

1. *Effective date of the rules: December 29, 2009.* The new rules become effective 60 days after publication in the Federal Register, which occurred October 30, 2009, yielding an effective date for the rule of December 29, 2009.

2. *Effective date for beginning measurement of CO₂: January 1, 2010.* Companies will be required to begin measuring GHG emissions or quantities of CO₂ “supplied” (for CO₂ producers) beginning January 1, 2010. There is a very short transitional period allowed (through March 31, 2010) for reporters to use “best available” monitoring methods as opposed to those required in the rule. Starting no later than April 1, 2010, the reporter must begin following all applicable monitoring and quality assurance/quality control requirements set out in the rule, unless they submit a request to EPA (and get EPA approval) showing that it is “not reasonably feasible to acquire, install, and operate” a required piece of monitoring equipment by April 1, 2010. *Final Rule*, at 42.

3. *Initial Report due: March 31, 2011.*

C. What must be measured and reported? In addition to basic identification information (name, etc.), there are two basic kinds of numbers that must be reported for CO₂ suppliers.

Production quantities. First, the supplier must report “the mass of CO₂ captured, extracted, imported, or exported”,¹⁴ consisting of the mass of CO₂ that is captured from each production process unit, and extracted from each [sic] CO₂ production wells”.¹⁵ This information must be *measured quarterly* at each well and reported annually.

Aggregation of production. The rule provides details on how the annual mass should be calculated.¹⁶ The rule specifies calculation options for CO₂ “through each flow meter”, and specifies a separate calculation methodology where “multiple flow meters are used”.¹⁷ In this case of multiple flow meters, the rule states that to aggregate data, one

¹⁴ § 98.421.

¹⁵ There is an apparent drafting “glitch” in Section 98.3 (c) (5). It states for suppliers, they must report the annual quantities of CO₂ (and certain other greenhouse gases) “that would be emitted from . . . use of the products supplied” and references the total quantity of GHG aggregated from all applicable supply categories “in subparts KK through PP”. Section 98.3 (c) (5) (i). The reference to CO₂ that “would be emitted” here appears to be a drafting error or oversight since the EPA recognizes elsewhere that CO₂ used in EOR operations is not necessarily emitted (as discussed below) and the detailed reporting requirements in Subpart PP require reporting of production quantities of CO₂ (expressed in metric tonnes), not transportation, distribution or the use of CO₂ in enhanced oil and gas recovery. Still it may be helpful to mention this to EPA Staff.

¹⁶ § 98.423.

¹⁷ § 98.423 (a).

sums the mass of CO₂ “for all flow meters” in accordance with a specified equation, identified as “Equation PP-3”, which is identified as follows:

$$\text{CO}_2 = \sum_{p=1}^U \text{CO}_{2,u}$$

Where:

CO₂ = Annual mass of CO₂ (metric tons) through all flow meters
 CO_{2,u} = Annual mass of CO₂ (metric tons) through flow meter u
 u = Flow meter.

No mention of “dome” reporting. While the preamble to the proposed rule specifically stated that EPA was proposing that all CO₂ production wells owned by a single owner or operator in a given “dome” report the mass of CO₂ extracted and/or transferred off site, the final rule does not mention reporting at the “dome” level, but instead provides for the measurement at “each” flow meter and the reporting of the aggregate of “all” flow meters. It appears that the Final Rule has substituted the aggregation formula above in place of the “dome reporting” approach.¹⁸

End use information, “if known”. Section 98.426 (f) requires the reporting of the aggregated annual quantity of CO₂ that is “transferred” to each of 13 end use applications (including a catch-all category of “other”), “if known”. The end use categories to be used include such categories as food and beverage, enhanced oil and natural gas recovery, “long-term storage (sequestration)”, research and development as well as various common industrial uses of CO₂.¹⁹

Information on measurement equipment. The rule further requires the reporting of:

- type of equipment used to measure the total flow of the CO₂ stream;
- the standard used to operate and calibrate the measuring equipment; and
- the number of days in the reporting year for which substitute data procedures were used for measuring quantity, concentration, or density.²⁰

Pre-April 2010 calibration of measurement equipment and the 5 % rule. Section 98.3 (i) sets out calibration accuracy requirements that must be met by each reporting entity. Calibration must be done prior to April 1, 2010²¹ unless the device has previously been

¹⁸ Note that under Section 98.422, captioned “GHG to report”, the Final Rule lists “(b) Mass of CO₂ extracted from each CO₂ production wells [sic]”. If read as requiring action reporting by individual well, this would be inconsistent with the aggregation rule in Section 98.423 (a). Clarification might be helpful to confirm that only aggregate data need be reported.

¹⁹ § 98.426 (f).

²⁰ § 98.426 (e).

²¹ § 98.98.3 (i) (5).

calibrated consistent with the EPA rule and the prior calibration is still active (i.e. “the device is not yet due for recalibration because the time interval between successive calibrations, as required by this part, has not elapsed”).²² The rule’s standards for calibration for different types of measurement devices are set out in Section 98.3 (ii) and (iii) and should be reviewed by technical personnel. There are certain exemptions to the calibration requirement for “fuel billing meters”²³ and for units that operate continuously with infrequent outages where the initial calibration cannot be done without removing the device from service and disrupting normal operation (in which case calibration may be deferred until the next scheduled maintenance outage).²⁴

The general requirement for calibration accuracy is that all measurement devices must be calibrated to an accuracy of 5 percent.²⁵ The rule does not indicate whether this means plus or minus 5 percent or whether EPA intends this to mean plus or minus 2.5 percent on either side.

D. *What record keeping requirements apply?* Recordkeeping requirements are detailed in Section 98.3 (g). The general requirement is to retain the relevant records for at least 3 years. The rule contains more detailed requirements on the specifics of record retention (and use and availability of electronic records), but generally requires retention of records identifying all activities for which the data were calculated, the underlying calculations and methods used, result of required analyses for carbon content; prior year annual GHG reports to the EPA; missing data computations; the entity’s monitoring plan (discussed below); the results of required certification and quality assurance tests and maintenance records for the measurement instrumentation.²⁶

E. *Mandatory “GHG Monitoring Plan”.* The rule effectively creates a requirement for each entity subject to the rule to create and maintain a “GHG Monitoring Plan”.²⁷ The GHG Monitoring Plan must be in writing and identify the positions of responsibility (i.e. job titles) for collection of the emissions data;²⁸ an explanation of the methods used to collect the necessary data; and a description of the procedures used for quality assurance, maintenance and repair of all instrumentation used to provide the data. Further details are provided on the use of references to existing corporate documents, revisions to the

²² § 98.98.3 (i) (1).

²³ § 98.98.3 (i) (4).

²⁴ § 98.98.3 (i) (6). Such postponements must be documented in the Monitoring Plan.

²⁵ § 98.98.3 (i) (1).

²⁶ § 98.3 (g) (1) - (7).

²⁷ The requirement to establish a monitoring plan is implicit in the rule in § 98.3 (g) (5) which is included in section detailing the records that must be kept.

²⁸ § 98.3 (g) (5) (i); The rule refers to “the emissions data”, but presumably EPA intends this to apply equally to “supply data”.

plan, availability of information in the event of EPA audit, and similar administrative matters.²⁹

F. *Other administrative provisions.* There are various other administrative provisions addressing, for example, the responsibility of the designated representative, alternative representatives, changing representatives, the certification of the annual report, changes in owners and operators, and how the report is submitted.³⁰ Additional definitions are also provided,³¹ which include definitions for such terms as CO₂ production well and CO₂ production well “facility” (which is generally defined as one or more wells on one or more contiguous or adjacent properties, which are under the control of the same entity” even if they are located on different leases, units, etc.).³²

Query with regard to non-methane based definition of “natural gas”. The term “natural gas” is very broadly defined as:

a naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in geologic formations beneath the earth’s surface, of which its constituents include, but are not limited to, methane, heavier hydrocarbons and carbon dioxide. Natural gas may be field quality (which varies widely) or pipeline quality. For the purposes of this subpart, the definition of natural gas includes similarly constituted fuels such as field production gas, process gas, and fuel gas.

Note that this definition does not require the principal component to be methane and taken literally would define a 98 percent CO₂ stream with 2 percent CH₄ to be “natural gas”. Query as to how this definition might be applied in other contexts. For instance, since a CO₂ stream is included in the definition of “natural gas” in this rule, it might encourage other regulatory agencies to try to include CO₂ within the definition of “natural gas”.³³

²⁹ § 98.3 (g) (5) (ii)-(iv).

³⁰ §§ 98.4 and 98.5.

³¹ § 98.6.

³² *Id.* (definition of carbon dioxide production well facility).

³³ Several decades ago, the Federal Energy Regulatory Commission ruled that a 98 percent CO₂ stream is not “natural gas” for purposes of the Natural Gas Act and has re-affirmed that ruling within the last few years. Nevertheless, some commentators have suggested that the FERC could decide to change its mind in order to bring CO₂ pipelines within the regulatory scheme under the Natural Gas Act. EPA’s expansive definition of “natural gas” is only applicable for the statutes that it administers and does not affect the FERC’s rulings under the Natural Gas Act.

III. HOW DID THE EPA RESPOND TO CCS ISSUES AND WHAT COMES NEXT?

In the Final rule, the EPA did respond favorably in a number of areas to comments that were raised but also effectively deferred its response on some other comments to a subsequent proceeding. Also, the agency shed some light on the “geologic sequestration rule” it intends to propose in the near future under the Clean Air Act.

1. The non-emission of EOR injections and the “geologic sequestration” rulemaking soon to come.

a. Overview. In responding to the concern that the proposed rule seemed to say that CO₂ injections for EOR were ultimately emitted to the atmosphere, the EPA clarified that it did not intend to characterize all CO₂ supply as “emissive”. The requirement for reporting, for example, was changed from reporting “GHG emissions” to reporting the “mass of CO₂ captured, extracted, imported or exported”.³⁴ Similarly, the title of § 98.423 was changed from “Calculating GHG Emissions” in the proposed rule to “Calculating CO₂ Supply” in the final rule.

With regard to EOR or geologic sequestration, EPA stated that it will need additional information on “the amount of CO₂ that is permanently and securely sequestered and on the monitoring and verification methodologies applied.” *Final Rule*, at 478.

Specifically referencing EOR, the preamble to the *Final Rule* recognized that physical trapping occurs in oil and gas reservoirs, but also recognized the need for more information:

With respect to EOR, the geology of an oil and gas reservoir can create a good barrier to trap CO₂ underground. Because these formations effectively stored oil or gas for hundreds of thousands to millions of years, it is believed that they can be used to store injected CO₂ for long periods of time. However, EPA also recognizes that the requirements to identify a suitable GS site extend beyond geophysical trapping parameters alone and include: the evaluation and appropriate management of potential leakage pathways, appropriate rate and pressure of injection, appropriate monitoring, and other such features. While *some amount* of CO₂ injected into oil and gas reservoirs for EOR purposes will be trapped in the subsurface, these and other site-specific elements influence the amount of CO₂ securely sequestered and the potential for release of CO₂ during EOR operations.

Final Rule, at 478-479 (emphasis supplied).

³⁴ Compare proposed § 98.421 (requiring CO₂ suppliers to report “GHG emissions”) to final § 98.421 (requiring reporting of CO₂ “captured, extracted, imported, or exported”).

As a result, (and as previously announced in the Notice of Data Availability (“NODA”) issued in the UIC rulemaking,³⁵) EPA reiterated its plans to issue “in the near future” a new proposal on geologic sequestration to address issues related to the Clean Air Act. *Final Rule*, at 480-481. That proceeding will consider how to address emissions and sequestration at active EOR facilities. EPA plans in that proceeding to seek comment on “monitoring, reporting, and verification methodologies which can be used to determine the amount of CO₂ emitted and geologically sequestered at active EOR facilities and geologic sequestration sites where CO₂ is injected (for long-term storage) into saline aquifers, oil and gas reservoirs, or other geologic formations.” *Id.* at 479.

That proceeding will also consider alternatives to data collection procedures and methodologies for fugitive and vented methane emissions from the oil and gas sector Subpart W. *Final Rule*, at 318, 480. It is not clear at the present time how EPA’s thinking may evolve for addressing fugitive emissions from the oil and gas sector including EOR surface facility operations. At present, all that is clear is that EPA views the data to be reported “under subsequent regulatory actions” together with the data required by the *Final Rule* to enable EPA “to understand the amount of CO₂ supplied, emitted, and sequestered in the U.S., to carry out a wide variety of CAA provisions.” *Final Rule*, at 480.

With regard to the timing of this new proceeding, indications from EPA staff suggest that the staff is still in the stage of developing a proposed rule and therefore may be open to hearing informal industry views in the near future.

b. Interaction of new proceeding with Reporting Rule and to pending UIC Rule. EPA repeatedly indicated that it is seeking to “harmonize” its regulations in this area and that the reporting requirements in the Reporting Rule and the proposed new rulemaking for CO₂ geologic sequestration sites are intended to “complement” each other and to harmonize as well with the reporting requirements under the UIC rulemaking. EPA stated that in the new Clean Air Act rulemaking on geologic sequestration it will rely on UIC permit requirements “to the maximum extent possible.”³⁶ All these issues will be open for comment in the new proceeding, which EPA will try to issue “in the same time frame” as it had planned for the stand-alone UIC GS rulemaking. *Final Rule*, at 481.

In terms of timing, EPA staff has indicated informally that a final rule in the UIC proceeding is not expected until late in 2010 or even early 2011.

2. Use of volumetric rather than mass flow meters. Several commenters objected to the proposed requirement to measure CO₂ production using mass flow meters rather than

³⁵ Notice of Data Availability, Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO₂) Geologic Sequestration (GS) Wells; Notice of Data Availability and Request for Comment, 74 Fed. Reg. 44802 (August 31, 2009).

³⁶ *Final Rule*, at 481.

allow companies to use existing industry-standard volumetric flow meters and then convert the volumetric number to the corresponding mass of CO₂ based on the CO₂ concentration in the measured flow. The EPA heeded these comments and removed the requirement to use mass flow meters, concluding, at page 488, that:

[A] reporter that measures CO₂ in a stream using a volumetric flow meter may use this volumetric flow meter to determine quantity rather than having to purchase and install a mass flow meter. EPA has concluded that providing this additional methodology reduces the burden on reporters without compromising the quality of data received by the agency.

The decision is reflected in the italicized portions of the regulatory text at §98.424 (a) (1) (page 1240 of EPA's September 22 version) which now states:

(a) Determination of quantity.

(1) Reporters that have a mass flow meter *or volumetric* flow meter installed to measure the flow of a CO₂ stream shall base calculations in §98.423 of this subpart on the installed mass flow *or volumetric* flow meters.

3. “Retention rate”. Several commenters had contested the statement in the NOPR referencing a study concluding that “retention rates” for CO₂ in EOR operations averaged 71 % and sought to explain that this was an indication of the efficiency of the injection for producing oil, and did not mean that 29 % of the injected CO₂ was lost or emitted to the atmosphere. While the EPA clarified that it did not intend to suggest that the referenced “retention” rate equated to the amount of CO₂ that was sequestered, the agency would not endorse a statement that all or nearly of the CO₂ injected in EOR activities remained sequestered underground. In effect, EPA is leaving that issue to be addressed in its forthcoming CAA geologic sequestration rulemaking proceeding.³⁷

EPA further clarified its understanding about the “retention rate” of CO₂ injections for EOR:

In the proposed Subpart PP preamble, EPA cited a study about the term “retention rate”. EPA understands from commenters that “retention rate” is defined as the amount of CO₂ that is injected into the underground formation (oil field), while

³⁷ *Response to Comments*, Volume 41, at 7:

EPA does not concur that citing a study on retention rates is equivalent to acknowledging that sequestration occurs during EOR activity. While EPA understands that some amount of CO₂ injected into oil and gas reservoirs for EOR purposes will be trapped in the subsurface, EPA concludes that site-specific elements beyond geophysical trapping parameters influence the amount of CO₂ securely sequestered.

the EOR site is operating and producing oil, and that is not recovered with the oil, and has to do with the efficiency of the CO₂ recycling process at an operating EOR site. EPA did not intend to suggest that “retention” equates to the amount of CO₂ sequestered in an underground formation. While EPA understands that some amount of CO₂ injected into oil and gas reservoirs for EOR purposes will be trapped in the subsurface, EPA concludes that site-specific elements beyond geophysical trapping parameters influence the amount of CO₂ securely sequestered.

Response to Comments, Volume 41, at 5 (re-affirmed or repeated essentially verbatim at 6, 28, 29, 40-41, and 50).

4. Exclusion of CO₂ transport, injection and storage facilities. The *Final Rule* makes it very clear that the rule applies only to *capture* and *CO₂ production* facilities, not to the downstream activities:

Carbon capture facilities are included in Subpart PP; facilities that capture CO₂ are required to report the amount of CO₂ captured and facilities that extract CO₂ from wells are required to report the amount of CO₂ extracted; *downstream processing, transport, injection, and storage facilities are not included in Subpart PP.*

Response to Comments, at 52 (emphasis added). *See also*, at 1, 2, 3, 5, 9, 11, 12, 13, 14, 16, 19, 21, 27, 34, and 45 (repeating near identical statement that the final rule “does not require CO₂ transport, injection, or storage facilities to report under Subpart PP” and that these issues will all be addressed in the geologic sequestration rulemaking).

Similarly, in response to comments about applicability in several different scenarios, EPA replied that it did not intend this subpart PP to cover facilities that take ownership of a CO₂ stream that has already been separated and removed from a manufacturing process or that has already been extracted from CO₂ production wells in order to do any of the following: store it in above ground storage of CO₂; transport or distribute it via pipelines, vessels, motor carriers, or other means; purify, compress, or process it; or sell it to other commercial applications. *Final Rule*, at 484. Rather the rule covers “facilities that own or operate the equipment that physically separates and removes CO₂ from an industrial or manufacturing process or physically extracts CO₂ from production wells”. *Id.* EPA explained that it adopted this approach because it concluded that the entity with “first touch” of the CO₂ supply was the most logical point of coverage. *Id.*

Thus EPA does not intend for this source category to include facilities “that capture CO₂ for further processing or use within the fence line of the facility (e.g., for their own use)”, but only CO₂ “that is captured or extracted for purposes of sequestration or supply to other facilities for commercial applications”, based on the conclusion that CO₂ captured

and used on-site is “equivalent to an intermediary step in production rather than an actual supply of CO₂”. *Id.*, at 485.

IV. CONCLUSION

Based on EPA’s *Final Rule* on reporting and its *Notice of Data Availability* in the still-pending UIC rulemaking, the supply and use of natural CO₂ for enhanced oil recovery operations could be regulated under two separate federal statutes (the Clean Water Act and the Clean Air Act) and pursuant to rules adopted in three separate rulemaking proceedings: (a) the UIC GS Proposed Rule; (b) the Final GHG Reporting Rule discussed above and (c) a to-be-proposed new rule on geologic sequestration under the CAA. While the *Final Rule* on reporting addresses the *upstream* stages of CO₂ production and extraction, the UIC rule and the to-be-proposed Geologic Sequestration rule will address the *downstream* storage of CO₂ (including injections of CO₂ produced from natural-occurring CO₂ domes) in connection with both EOR and non-EOR related geologic sequestration. Taken together these new rules for naturally-occurring CO₂ will add a regulatory compliance cost to the overall cost CO₂-based EOR operations, which may be quite substantial and represent a significant departure from EOR business as usual.

Those involved in the supply of natural CO₂ for EOR will want to take note of these developments and develop a response that preserves the status quo regulatory environment. Such a response must at a minimum show the effectiveness of EOR operators’ ability to store CO₂ for long periods of time and drive home the fact that CO₂ produced naturally and used in EOR operations is not emitted to the atmosphere and should therefore be outside of the scope of CAA data gathering and proposed regulations.

ATTACHMENTS

- Appendix A: excerpts from preamble to *Final Rule* addressing Subpart PP issues
- Appendix B: regulatory text of Subpart PP (to be codified at 40 CFR §§ 98.1 to 98.9 and §§ 98.420 to 98.428)
- Appendix C: selected excerpts from EPA’s responses to comments on Subpart PP issues

ation, and destruction can have accuracy and precision of these facilities' fluorinated GHG emission estimates. For one method of monitoring F-GHG emissions under consideration, a one percent relative error in production mass measurements could result in a much higher relative error in the emissions estimate, e.g., over 90 percent at an emission rate of 1.5 percent. For other methods of monitoring F-GHG emissions, however, a one percent relative error in production mass measurements would not lead to large errors in emission estimates. For both 40 CFR part 98, subpart OO and 40 CFR part 98, subpart L, EPA's goal is to optimize methods of data collection to ensure data accuracy while considering industry burden.

PP. Suppliers of Carbon Dioxide (CO₂)

**SUBPART PP
Suppliers of Carbon Dioxide**

1. Summary of the Final Rule

Source Category Definition. Under the rule, suppliers of CO₂ consist of the following:

- Facilities with production process units that capture and supply CO₂ for commercial applications or that capture and maintain custody of a CO₂ stream in order to sequester or otherwise inject it underground.
- Facilities with CO₂ production wells that extract a CO₂ stream for the purpose of supplying CO₂ for commercial applications.
- Importers of bulk CO₂, if total combined imports of CO₂ and other GHGs exceed 25,000 metric tons of CO₂ equivalent (CO₂e) per year.

- Exporters of bulk CO₂, if total combined exports of CO₂ and other GHGs exceed 25,000 metric tons CO₂e per year.

This source category is focused on upstream supply. It does not cover: storage of CO₂ above ground or in geologic formations; use of CO₂ in enhanced oil and gas recovery; transportation or distribution of CO₂; or purification, compression, on-site use of CO₂ captured on site, or processing of CO₂. This source category does not include CO₂ imported or exported in equipment, such as fire extinguishers.

Suppliers of CO₂ that meet the applicability criteria in the General Provisions (40 CFR 98.2) summarized in Section II.A of this preamble must submit GHG reports.

GHGs to Report. Suppliers of CO₂ must report the mass of CO₂ in a stream captured from production process units and extracted from production wells, and the mass of CO₂ in containers that is imported and exported.

GHG Emissions Calculation and Monitoring. While this source category is focused on upstream supply of CO₂, EPA recognizes that all CO₂ supplied to the economy does not necessarily result in an emission. There are a variety of downstream applications for CO₂ - some applications are emissive and some are non-emissive. Under this rulemaking, a CO₂ supplier facility must calculate the mass of CO₂ supplied quarterly by measuring the mass or volumetric flow of gas and multiplying by the CO₂ concentration, and density in the case a volumetric flow meter is used, of the gas or liquid, as specified below. EPA requires quarterly

monitoring because EPA has concluded that the CO₂ concentration of the stream varies throughout the year, and a quarterly concentration number multiplied by a quarterly volume will generate more accurate calculation of CO₂ supply than annual measurements. EPA requires these quarterly numbers to be reported or that EPA can electronically verify the calculations. The CO₂ supplier must also provide information on the downstream CO₂ application, if known. Reporters must use the following methodologies, as applicable, for calculating CO₂ supplied:

- For suppliers that make measurements with mass flow meters, calculate quarterly for each meter the total mass of CO₂ in a CO₂ stream in metric tons, prior to any subsequent purification, processing, or compressing, according to Equation PP-1 of 40 CFR 98.423. Measure mass flow and concentration in accordance with 40 CFR 98.424.
- For suppliers that make measurements with volumetric flow meters, calculate quarterly for each meter the total mass of CO₂ in a CO₂ stream in metric tons, prior to any subsequent purification, processing, or compressing, according to Equation PP-2 of 40 CFR 98.423. Measure volumetric flow, concentration and density in accordance with 40 CFR 98.424.
- For suppliers that have multiple flow meters, aggregate data according to methods specified in Equation PP-3 in 40 CFR 98.423.
- Importers or exporters that import or export CO₂ in containers must calculate the total mass of CO₂ supplied in metric tons, prior to any subsequent purification, processing, or compressing, according to equation PP-4 of 40 CFR 98.423. Use weigh bills, scales, or load cells to measure the mass of CO₂ imported or exported in containers.

Data Reporting. In addition to the information required to be reported by the General Provisions (40 CFR 98.3(c)) and summarized in Section II.A of this preamble, reporters must submit additional data that are used to calculate CO₂ supply. A list of the specific data to be reported for this source category is contained in 40 CFR 98.426.

Recordkeeping. In addition to the records required by the General Provisions (40 CFR 98.3(g)) and summarized in Section II.A of this preamble, reporters must keep records of additional data used to calculate CO₂ supply. A list of specific records that must be retained for this source category is included in 40 CFR 98.427.

2. Summary of Major Changes Since Proposal

The major changes since proposal are identified in the following list. The rationale for these and any other significant changes can be found below or in "Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments, Subpart PP: Suppliers of Carbon Dioxide."

- We added equations and QA requirements to allow reporters to determine CO₂ quantity using volumetric flow meters, weigh bills, scales, or load cells, as appropriate. These additions supplement the proposed equations and quality assurance requirements to determine CO₂ quantity using mass flow meters.
- We revised the reporting procedures for missing data in 40 CFR 98.425. Facilities must use quarterly

values as substitute data as can no longer use annual average values. We added missing data procedures to allow for more quarterly data points to be used, as appropriate. EPA concluded that quarterly missing data values will generate more accurate estimates than annual average values.

- To improve the emissions verification process, we reorganized and updated 40 CFR 98.426. We moved some data elements from 40 CFR 98.427 to 40 CFR 98.426, and added some data elements that a reporter must already use to calculate GHGs as specified in 40 CFR 98.423 to 40 CFR 98.426 for clarity.
- We revised the reporting and calculation procedures to require facilities using flow meters to determine annual mass for every flow meter used. To aggregate data at the facility level for CO₂ being captured in production wells or production process units, we have added Equation PP-3.
- To decrease unnecessary sampling burden, we have removed the requirement of quarterly concentration sampling for importers and exporters that use containers of CO₂.

3. Summary of Comments and Responses

This section contains a brief summary of major comments and responses. A large number of comments on suppliers of CO₂ were received covering numerous topics. Responses to significant comments received can be found in "Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments, Subpart PP: Suppliers of Carbon Dioxide."

Definition of Source Category

Comment: EPA received many comments about how we defined the source category in this Subpart. One group of comments stated that the CO₂ supplied to the economy should not be characterized as an emission. Some in this group of

comments specified that much of the supplied CO₂ is stored at enhanced oil recovery (EOR) sites, which are "closed systems", rather than emitted. In general, these same commenters stated that any CO₂ reporting requirements placed by EPA on industry should be placed on downstream CO₂ users, such as EOR facilities, rather than CO₂ suppliers and should be for actual emissions only. Other comments echoed that EPA needs to collect data from recipients of supplied CO₂ such as EOR sites. This group pressed upon EPA the need to collect not only data on actual emissions but also data on injection, production, and geologic sequestration of CO₂. Some of the benefits cited for collecting such comprehensive data include: assisting in ensuring no more than negligible releases at a facility if it is properly sited, designed, and permitted; achieving full public accountability of CO₂ geologic sequestration effectiveness; and tracking the CO₂ throughout the entire carbon dioxide capture and sequestration (CCS) chain for the purposes of adjusting CO₂ emissions reported or assigning offsets. Along those lines, some commenters urged EPA to rely on or expand the existing underground injection control (UIC) program to deal with CCS.

Response: EPA did not intend to characterize all CO₂ supplied to the economy as emissions and recognizes that

there are a variety of applications for CO₂, both emissive and non-emissive. CO₂ supplied to the economy would result in an emission if the CO₂ were used in an application which would ultimately result in release of the CO₂ to the atmosphere. EPA is also collecting information from upstream suppliers in other subparts of this rulemaking such as natural gas supply and petroleum product supply.

EPA recognizes that, in order to determine whether or not supplied CO₂ has been or will be released to the atmosphere (e.g. emitted), the Agency needs information on the downstream CO₂ end-use. In today's final rulemaking, CO₂ suppliers must provide information on the downstream CO₂ application, if known. EPA believes information on the end-use will provide some idea of the amounts of CO₂ which are emitted. Where that end-use is geologic sequestration (at EOR or other types of facilities), EPA will need additional information on the amount of CO₂ that is permanently and securely sequestered and on the monitoring and verification methodologies applied. With respect to EOR, the geology of an oil and gas reservoir can create a good barrier to trap CO₂ underground. Because these formations effectively stored oil or gas for hundreds of thousands to millions of years, it is believed that they can be used to store injected CO₂ for long periods of time.

However, EPA also recognizes that the requirements to identify a suitable GS site extend beyond geophysical trapping parameters alone and include: the evaluation and appropriate management of potential leakage pathways, appropriate rate and pressure of injection, appropriate monitoring, and other such features. While some amount of CO₂ injected into oil and gas reservoirs for EOR purposes will be trapped in the subsurface, these and other site-specific elements influence the amount of CO₂ securely sequestered and the potential for release of CO₂ during EOR operations.

New NOPR on Geologic Sequestration to issue in "near future"

Given the comments in support of downstream data collection, particularly with respect to EOR systems and CO₂ geologic sequestration (at EOR or other types of facilities), EPA plans to issue a new proposal on geologic sequestration and will consider how to address emissions and sequestration at active EOR facilities. EPA will take action on this issue in the near future with the goal that data collection for these types of facilities can begin as quickly as possible. EPA will seek comment on monitoring, reporting, and verification methodologies which can be used to determine the amount of CO₂ emitted and geologically sequestered at active EOR facilities and geologic sequestration sites where CO₂ is injected (for long-term

storage) into saline aquifers, oil and gas reservoirs, or other geologic formations. Furthermore, as stated in Section III.W of this preamble, EPA plans to take additional time to consider alternatives to data collection procedures and methodologies in the proposed 40 CFR part 98, subpart W and will consider inclusion of GHG reporting from other sectors of the oil and gas industry besides those proposed for reporting in proposed 40 CFR part 98, subpart W. EOR surface facility operations may be part of those considerations. The data reported under subsequent regulatory actions and the data reported under today's rulemaking will together enable EPA to understand the amount of CO₂ supplied, emitted, and sequestered in the U.S., to carry out a wide variety of CAA provisions. The options that we will have considered and the resulting recommended approaches will be further fleshed out through a notice and comment process. See the next comment response for a discussion of why EPA still needs to collect CO₂ supplier data in today's rulemaking even though a new rulemaking on sequestration is planned.

In response to comments that EPA should rely on or expand the UIC program to address emissions of CO₂, that issue is outside the scope of this rulemaking. However, EPA agrees that the UIC program and EPA's authority under

the Safe Drinking Water Act (SDWA) will provide a foundation for ensuring safe and effective containment of CO₂. However, SDWA is focused on permitting sites for protection of ground and drinking water; the new proposal discussed above will be designed to address issues related to the CAA. EPA intends to harmonize CCS requirements across relevant statutory or other programs in order to minimize any redundancy and any burden on reporters. The reporting requirements in today's rulemaking for CO₂ suppliers and the reporting requirements in new rulemaking for CO₂ geologic sequestration sites will complement each other and together they can be harmonized with reporting requirements under the UIC proposed rulemaking. In a new CAA rulemaking on geologic sequestration reporting, EPA will rely on UIC permit requirements to the maximum extent possible. EPA will seek comment on these issues and will also endeavor to issue a geologic sequestration GHG reporting rule in the same time frame as it has planned for the stand-alone UIC GS rulemaking.

Geologic Sequestration NOPR to be under CAA

interaction of CWA and CAA rulemakings

Comment: EPA received comments requesting information on how CO₂ supply will assist EPA in developing future climate policy. Commenters stated that they do not believe CO₂ supply data will provide EPA with useful information. Commenters stated that data collection from CO₂ suppliers

does not fit within EPA's mandate from Congress to measure upstream emissions only as appropriate.

Response: As discussed in Sections I.C and II.Q of this preamble, EPA is collecting data from CO₂ suppliers in today's rule to carry out a wide variety of CAA provisions, as authorized broadly under CAA Sections 114 and 208. For example, this data will enable EPA to evaluate the appropriate action to take under section 103 regarding non-regulatory strategies for pollution prevention. It will also inform evaluation of possible CAA regulation of the supplier and/or recipient of the CO₂. Data on CO₂ supply to the economy will allow EPA to make a well informed decision about whether and how to use the CAA to regulate facilities that capture, sequester, or otherwise receive CO₂ as an end-user.

Though CO₂ capture and geologic sequestration are occurring now on a relatively small scale, CCS is expected to play a major role in mitigating GHG emissions from a wide variety of stationary sources. According to the Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007 (EPA, April 2009), stationary sources contributed 67 percent of the total CO₂ emissions from fossil fuel combustion in 2007. The stationary sources represent a wide variety of sectors amenable to CO₂ capture; electric

power plants (existing and new), natural gas processing facilities, petroleum refineries, iron & steel foundries, ethylene plants, hydrogen production facilities, ammonia refineries, ethanol production facilities, ethylene oxide plants, and cement kilns. Furthermore, 95 percent of the 500 largest stationary sources are within 50 miles of a candidate CO₂ reservoir²².

With this rule, EPA will begin building capacity to track the growth in CO₂ supply and learn about its disposition throughout the economy. EPA has concluded that we need data now from CO₂ suppliers - both industrial facilities and CO₂ production wells - in order to effectively track how the supply sources will change over time. For example, we will need to track if and by how much CO₂ captured from industrial facilities will offset or displace CO₂ produced from natural formations. Even after EPA begins collecting data on CO₂ geologic sequestration under the proposed new rulemaking (discussed above), EPA will continue to need data from CO₂ suppliers in order to track any CO₂ that is not sequestered.

²² Dooley, JJ, CL Davidson, RT Dahowski, MA Wise, N Gupta, SH Kim, EL Malone, "Carbon Dioxide Capture and Geologic Storage: A Key Component of a Global Energy Technology Strategy to Address Climate Change." Joint Global Change Research Institute, Battelle Pacific Northwest Division. May 2006. PNWD-3602. College Park, MD.

Comment: EPA received some comments asking whether a specific situation results in coverage under 40 CFR part 98, subpart PP, and some comments requesting that their specific situation be exempt from coverage. For example, one commenter asked whether a facility separating CO₂ that is not supplied to downstream customers is a covered facility. Another asked that a pulp and paper mill that transfers a CO₂ stream to an adjacent facility by pipeline be exempt from 40 CFR part 98, subpart PP. Several commenters requested clarification on specific scenarios such as taking ownership of an already separated CO₂ stream for further processing, separating CO₂ for their own use, and operating versus owning the separation unit.

Response: EPA did not intend for 40 CFR part 98, subpart PP to cover facilities that take ownership of a CO₂ stream that has already been separated and removed from a manufacturing process or that has already been extracted

Downstream
activities of
CO₂ suppliers
NOT SUBJECT
to this rule

from CO₂ production wells in order to do any of the following: store it in above ground storage of CO₂, transport or distribute it via pipelines, vessels, motor carriers, or other means; purify, compress, or process it; or sell it to other commercial applications. 40 CFR part 98, subpart PP covers facilities that own or operate the equipment that physically separates and removes CO₂ from an

industrial or manufacturing process or physically extracts CO₂ from production wells because we concluded that the entity with first touch of the CO₂ supply was the most logical point of coverage. We wanted to minimize any unnecessary duplicative reporting of the same CO₂ by being as specific as possible about who in the supply chain is responsible for reporting it.

We did not intend for this source category to include facilities that capture CO₂ for further processing or use within the fence line of the facility (e.g., for their own use). EPA proposed that 40 CFR part 98, subpart PP only cover CO₂ that is captured or extracted for purposes of sequestration or supply to other facilities for commercial applications because we concluded that CO₂ captured and used on-site is equivalent to an intermediary step in production rather than an actual supply of CO₂.

Comment: EPA received a comment requesting that ethanol plants and other facilities capturing CO₂ from biomass be exempt from Subpart PP.

Response: A long standing inventory convention adopted by the IPCC, the UNFCCC, the US GHG Inventory, and many other reporting programs is separate treatment of emissions of CO₂ from the combustion of biomass and biomass-based fuels from emissions of CO₂ from the combustion of

fossil-based products. In national inventories, emissions from the combustion of biomass-based fuels are accounted for as part of a comprehensive system-wide tracking of carbon dioxide emissions and sequestration in the land-use, land-use change and forestry sector and the agriculture sector, rather than at the point of fuel combustion. Consistent with this approach, in the proposed and final rule, downstream emitters must only consider non-biogenic emissions when conducting a threshold analysis; however, downstream emitters must report both biogenic and non-biogenic emissions once they trigger the reporting threshold because data on non-biogenic emissions is useful and informative.

For the final rule, EPA has decided not to apply the same approach to suppliers of CO₂. We have concluded that data on capture of biogenic CO₂ would be useful and informative because biogenic CO₂ can potentially be stored in GS sites, or displace fossil CO₂ applications. We need a full picture of the CO₂ being supplied into the economy. Though CO₂ capture and sequestration is occurring now on a relatively small scale, it is expected to play a major role in mitigating GHG emissions. Therefore information on all potential sources of CO₂ for sequestration is necessary for a complete picture. Thus, a facility that captures CO₂ from

biomass and otherwise meets the applicability test is covered under 40 CFR part 98, subpart PP and is required to report all CO₂ supplied along with the percentage of that supply that is biomass-based.

Monitoring and QA/QC Requirements

Comment: A large number of commenters requested that volumetric flow meters be allowed for purposes of calculating CO₂ supply in place of or in addition to mass flow meters. These comments indicated that mass flow meters are not in operation at many covered facilities, and the cost to comply with such an equipment requirement would be unnecessarily high. Some commenters suggested that reporters should be allowed to use sales contracts to determine quantity of CO₂ as long as the CBI is protected. Some commenters indicated that CO₂ liquefaction and purification facilities do not operate flow meters for the course of usual business. One of these also commented that importers and exporters of CO₂ do not operate flow meters for the course of usual business if they handle the product in containers and requested consideration of this incongruity.

Response: As a result of these comments, EPA added two equations to the methodology section of 40 CFR part 98, subpart PP in today's rule in order to ensure that all

Volumetric Flow
Meters are OK

covered CO₂ can be reported, irrespective of technical or physical conditions. Therefore, a reporter that measures CO₂ in a stream using a volumetric flow meter may use this volumetric flow meter to determine quantity rather than having to purchase and install a mass flow meter. EPA has concluded that providing this additional methodology reduces the burden on reporters without compromising the quality of data received by the agency. In addition, a reporter that imports or exports CO₂ in containers may use weigh bills, scales, or load cells to determine quantity because applying a mass flow meter would be technically impossible. EPA has concluded that providing this additional methodology reduces the burden on reporters without compromising the quality of data received by the agency.

The final rule does not require reporting from facilities that liquefy or purify CO₂ that has already been separated or removed from a manufacturing process or already extracted from production wells. Therefore we did not give consideration to the types of equipment in operation at such facilities.

Finally, the rule does not allow reporters to use sales contracts to determine quantity because EPA has concluded that reporters capturing or extracting CO₂ already

operate mass or volumetric flow meters, or already determine quantities of CO₂ imported or exported in containers using weigh bills, scales, or load cells. EPA has concluded that mass and volumetric flow meters provide more accurate data than sales contracts.

IV. Mobile Sources

A. Summary of Requirements of the Final Rule

For manufacturers of engines used in mobile sources outside of the light-duty sector²³, this rule includes new requirements for reporting emission rates of GHGs.²⁴ Mobile source engine manufacturers have been measuring CO₂ emission rates from their products for many years as a part of normal business practices and existing criteria pollutant emission certification programs, but they have not consistently reported these values to EPA. This final rule requires manufacturers to consistently measure and report CO₂ for all engines beginning with model year 2011 and other GHGs in subsequent model years.²⁵ Manufacturers meeting the definitions of "small business" or "small volume

²³ Manufacturers of light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles are not covered in this final rule.

²⁴ The term "manufacturer," as well as the term "manufacturing company," as used in this preamble, means companies that are subject to EPA emission certification requirements. This primarily includes companies that manufacture engines domestically and foreign manufacturers that import engines into the U.S. market. In some cases this also includes domestic companies that are required to meet EPA certification requirements when they import foreign-manufactured engines.

²⁵ For aircraft engine manufacturers, reporting requirements will apply for the engine models in production in 2011.

the import.

(3) The U.S. Customs entry form.

(d) In addition to the data required by §98.3(g), the bulk exporter shall retain the following records substantiating each of the exports that they report:

(1) A copy of the bill of lading for the export and

(2) The invoice for the import.

(e) Every person who imports a container with a heel that is not reported under §98.416(c) shall keep records of the amount brought into the United States that document that the residual amount in each shipment is less than 10 percent of the volume of the container and will:

(1) Remain in the container and be included in a future shipment.

(2) Be recovered and transformed.

Be recovered and destroyed.

Be recovered and included in a future shipment.

§98.418 Definitions.

All terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

Subpart PP

Subpart PP—Suppliers of Carbon Dioxide

§98.420 Definition of the source category.

(a) The carbon dioxide (CO₂) supplier source category consists of the following:

(1) Facilities with production process units that capture a CO₂ stream for purposes of supplying CO₂ for commercial applications or that capture and maintain custody of a CO₂ stream in order to sequester or otherwise inject it underground. Capture refers to the initial separation and removal of CO₂ from a manufacturing process or any other process.

Production Wells

(2) Facilities with CO₂ production wells that extract or produce a CO₂ stream for purposes of supplying CO₂ for commercial applications or that extract and maintain custody of a CO₂ stream in order to sequester or otherwise inject it underground.

(3) Importers or exporters of bulk CO₂.

(b) This source category is focused on upstream supply. It does not cover:

- (1) Storage of CO₂ above ground or in geologic formations.
 - (2) Use of CO₂ in enhanced oil and gas recovery.
 - (3) Transportation or distribution of CO₂.
 - (4) Purification, compression, or processing of CO₂.
 - (5) On-site use of CO₂ captured on site.
- (c) This source category does not include CO₂ imported or exported in equipment, such as fire extinguishers.

EXCLUDES:
 - storage of CO₂ in geologic formations;
 -- use of CO₂ in EOR
 -- transportation or distribution of CO₂
 -- on-site use of CO₂ captured on-site

§98.421 Reporting threshold.

What to report: - mass of CO ₂ extracted
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Any supplier of CO₂ who meets the requirements of §98.2(a)(4) of subpart A of this part must report the mass of CO₂ captured, extracted, imported, or exported.

§98.422 GHGs to report.

(a) Mass of CO₂ captured from each production process unit.

What to report: - mass of CO ₂ extracted from each CO ₂ production well
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(b) Mass of CO₂ extracted from each CO₂ production wells.

(c) Mass of CO₂ imported.

(d) Mass of CO₂ exported.

§98.423 Calculating CO₂ Supply.

(a) Calculate the annual mass of CO₂ captured, extracted, imported, or exported through each flow meter in accordance with the procedures specified in either paragraph (a)(1) or (a)(2) of this section. If multiple flow meters are used, you shall calculate the annual mass of CO₂ for all flow meters according to the procedures specified in paragraph (a)(3) of this section.

(1) For each mass flow meter, you shall calculate quarterly the mass of CO₂ in a CO₂ stream in metric tons,

prior to any subsequent purification, processing, or compressing, by multiplying the mass flow by the composition data, according to Equation PP-1 of this section. Mass flow and composition data measurements shall be made in accordance with §98.424 of this subpart.

$$CO_{2,u} = \sum_{p=1}^4 Q_{p,u} * C_{CO_{2,p,u}} \quad (\text{Eq. PP-1})$$

Where:

$CO_{2,u}$ = Annual mass of CO_2 (metric tons) through flow meter u.

$C_{CO_{2,p,u}}$ = Quarterly CO_2 concentration measurement in flow for flow meter u in quarter p (wt. % CO_2).

$Q_{p,u}$ = Quarterly mass flow rate measurement for flow meter u in quarter p (metric tons).

p = Quarter of the year.

u = Flow meter.

(2) For each volumetric flow meter, you shall calculate quarterly the mass of CO_2 in a CO_2 stream in metric tons, prior to any subsequent purification, processing, or compressing, by multiplying the volumetric flow by the concentration and density data, according to Equation PP-2 of this section. Volumetric flow, concentration and density data measurements shall be made in accordance with §98.424 of this section.

$$CO_{2,u} = \sum_{p=1}^4 Q_p * D_p * C_{CO_2,p} \quad (\text{Eq. PP-2})$$

Where:

$CO_{2,u}$ = Annual mass of CO_2 (metric tons) through flow meter u.

$C_{CO_2,p}$ = Quarterly CO_2 concentration measurement in flow for flow meter u in quarter p (wt. % CO_2).

Q_p = Quarterly volumetric flow rate measurement for flow meter u in quarter p (standard cubic meters).

D_p = Quarterly CO_2 stream density measurement for flow meter u in quarter p (metric tons per standard cubic meter).

p = Quarter of the year.

u = Flow meter.

For aggregating data from ALL FLOW meters

(3) To aggregate data, sum the mass of CO_2 for all flow meters in accordance with Equation PP-3 of this section.

$$CO_2 = \sum_{p=1}^U CO_{2,u} \quad (\text{Eq. PP-3})$$

Where:

CO_2 = Annual mass of CO_2 (metric tons) through all flow meters.

$CO_{2,u}$ = Annual mass of CO_2 (metric tons) through flow meter u.

u = Flow meter.

(b) Importers or exporters that import or export CO_2 in containers shall calculate the total mass of CO_2 imported

or exported in metric tons, prior to any subsequent purification, processing, or compressing, based on summing the mass in each CO₂ container using weigh bills, scales, or load cells according to Equation PP-4 of this section.

$$\text{CO}_2 = \sum_{p=1}^I Q \quad (\text{Eq. PP-4})$$

Where:

CO₂ = Annual mass of CO₂ (metric tons).

Q = Annual mass in all CO₂ containers imported or exported during the reporting year (metric tons).

§98.424 Monitoring and QA/QC requirements.

(a) Determination of quantity.

Volumetric meter is OK

(1) Reporters that have a mass flow meter or volumetric flow meter installed to measure the flow of a CO₂ stream shall base calculations in §98.423 of this subpart on the installed mass flow or volumetric flow meters.

(2) Reporters that do not have a mass flow meter or volumetric flow meter installed to measure the flow of the CO₂ stream shall base calculations in §98.423 of this subpart on the flow of gas transferred off site using a mass flow meter or a volumetric flow meter located at the point of off-site transfer.

(3) Importers or exporters that import or export CO₂ in containers shall measure the mass in each CO₂ container using weigh bills, scales, or load cells and sum the mass in all containers imported or exported during the reporting year.

(4) All flow meters, scales, and load cells used to measure quantities that are reported in §98.423 of this subpart shall be operated **and calibrated** according to the following procedure:

Calibration
requirements

(i) You shall use an appropriate standard method published by a consensus-based standards organization if such a method exists. Consensus-based standards organizations include, but are not limited to, the following: ASTM International, the American National Standards Institute (ANSI), the American Gas Association (AGA), the American Society of Mechanical Engineers (ASME), the American Petroleum Institute (API), and the North American Energy Standards Board (NAESB).

(ii) Where no appropriate standard method developed by a consensus-based standards organization exists, you shall follow industry standard practices.

(iii) You must ensure that any flow meter calibrations performed are NIST traceable.

(5) Reporters using Equation PP-2 of this subpart shall measure the density of the CO₂ stream on a quarterly basis in order to calculate the mass of the CO₂ stream according to the following procedure:

(i) You shall use an appropriate standard method published by a consensus-based standards organization to measure density if such a method exists. Consensus-based standards organizations include, but are not limited to, the following: ASTM International, the American National Standards Institute (ANSI), the American Gas Association (AGA), the American Society of Mechanical Engineers (ASME), the American Petroleum Institute (API), and the North American Energy Standards Board (NAESB).

(ii) Where no appropriate standard method developed by a consensus-based standards organization exists, you shall follow industry standard practices.

(b) Determination of concentration.

(1) Reporters using Equation PP-1 or PP-2 of this subpart shall sample the CO₂ stream on a quarterly basis to determine the composition of the CO₂ stream.

(2) Methods to measure the composition of the CO₂ stream must conform to applicable chemical analytical standards. Acceptable methods include U.S. Food and Drug

Administration food-grade specifications for CO₂ (see 21 CFR 184.1250) and ASTM standard E1747-95 (Reapproved 2005) Standard Guide for Purity of Carbon Dioxide Used in Supercritical Fluid Applications (incorporated by reference, see §98.7 of subpart A of this part).

§98.425 Procedures for estimating missing data.

(a) Whenever the quality assurance procedures in §98.424(a) of this subpart cannot be followed to measure quarterly mass flow or volumetric flow of CO₂, the most appropriate of the following missing data procedures shall be followed:

(1) A quarterly CO₂ mass flow or volumetric flow value that is missing may be substituted with a quarterly value measured during another quarter of the current reporting year.

(2) A quarterly CO₂ mass flow or volumetric flow value that is missing may be substituted with a quarterly value measured during the same quarter from the past reporting year.

(3) If a mass or volumetric flow meter is installed to measure the CO₂ stream, you may substitute data from a mass or volumetric flow meter measuring the CO₂ stream

transferred for any period during which the installed meter is inoperable.

(4) The mass or volumetric flow used for purposes of product tracking and billing according to the reporter's established procedures may be substituted for any period during which measurement equipment is inoperable.

(b) Whenever the quality assurance procedures in §98.424(b) of this subpart cannot be followed to determine concentration of the CO₂ stream, the most appropriate of the following missing data procedures shall be followed:

(1) A quarterly concentration value that is missing may be substituted with a quarterly value measured during another quarter of the current reporting year.

(2) A quarterly concentration value that is missing may be substituted with a quarterly value measured during the same quarter from the previous reporting year.

(3) The concentration used for purposes of product tracking and billing according to the reporter's established procedures may be substituted for any quarterly value.

(c) Missing data on density of the CO₂ stream shall be substituted with quarterly or annual average values from the previous calendar year.

§98.426 Data reporting requirements.

In addition to the information required by §98.3(c) of subpart A of this part, the annual report shall contain the following information, as applicable:

For MASS FLOW

(a) If you use Equation PP-1 of this subpart, report the following information for each mass flow meter:

- (1) Annual mass in metric tons of CO₂.
- (2) Quarterly mass flow of CO₂.
- (3) Quarterly concentration of the CO₂ stream.
- (4) The standard used to measure CO₂ concentration.

For VOLUMETRIC
Flow meters

(b) If you use Equation PP-2 of this subpart, report the following information for each volumetric flow meter:

- (1) Annual mass in metric tons of CO₂.
- (2) Quarterly volumetric flow of CO₂.
- (3) Quarterly concentration of the CO₂ stream.
- (4) Quarterly density of the CO₂ stream.
- (5) The method used to measure density.
- (6) The standard used to measure CO₂ concentration.

AGGREGATED
Data for "all flow
meters" where

(c) If you use Equation PP-3 of this subpart, report the annual CO₂ mass in metric tons from all flow meters.

Corporate level
reporting for
IMPORT-EXPORT

(d) If you use Equation PP-4 of this subpart, report at the corporate level the annual mass of CO₂ in metric tons in all CO₂ containers that are imported or exported.

(e) Each reporter shall report the following information:

(1) The type of equipment used to measure the total flow of the CO₂ stream or the total mass in CO₂ containers.

(2) The standard used to operate and calibrate the equipment reported in (e)(1) of this section.

(3) The number of days in the reporting year for which substitute data procedures were used for the following purpose:

(i) To measure quantity.

(ii) To measure concentration.

(iii) To measure density.

Report total CO₂ quantity transferred to specified end use applications, if known

(f) Report the aggregated annual quantity of CO₂ in metric tons that is transferred to each of the following end use applications, if known:

(i) Food and beverage.

(ii) Industrial and municipal water/wastewater treatment.

- (iii) Metal fabrication, including welding and cutting.
- (iv) Greenhouse uses for plant growth.
- (v) Fumigants (e.g., grain storage) and herbicides.
- (vi) Pulp and paper.
- (vii) Cleaning and solvent use.
- (viii) Fire fighting.
- (ix) Transportation and storage of explosives.
- (x) Enhanced oil and natural gas recovery.
- (xi) Long-term storage (sequestration).
- (xii) Research and development.
- (xiii) Other.

(g) Each production process unit that captures a CO₂ stream for purposes of supplying CO₂ for commercial applications or in order to sequester or otherwise inject it underground when custody of the CO₂ is maintained shall report the percentage of that stream, if any, that is biomass-based during the reporting year.

§98.427 Records that must be retained.

In addition to the records required by §98.3(g) of subpart A of this part, you must retain the records

specified in paragraphs (a) through (c) of this section, as applicable.

(a) The owner or operator of a facility containing production process units must retain quarterly records of captured or transferred CO₂ streams and composition.

(b) The owner or operator of a CO₂ production well facility must maintain quarterly records of the mass flow or volumetric flow of the extracted or transferred CO₂ stream and concentration and density if volumetric flow meters are used.

(c) Importers or exporters of CO₂ must retain annual records of the mass flow, volumetric flow, and mass of CO₂ imported or exported.

§98.428 Definitions.

All terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

PART 1033—[AMENDED]

21. The authority citation for part 1033 continues to read as follows:

Authority: 42 U.S.C. 7401-7671q.

Subpart C—[Amended]

22. Section 1033.205 is amended by revising paragraph (d) (8) to read as follows:

§1033.205 Applying for a certificate of conformity.

* * * * *

(d) * * *

(8) (i) All test data you obtained for each test engine or locomotive. As described in §1033.235, we may allow you to demonstrate compliance based on results from previous emission tests, development tests, or other testing information. Include data for NO_x, PM, HC, CO, and CO₂.

(ii) Report measured CO₂, N₂O, and CH₄ as described in §1033.235. Small manufacturers/remanufacturers may omit reporting N₂O and CH₄.

* * * * *

Volume 41 of Comment responses:

Source: <http://www.epa.gov/climatechange/emissions/downloads09/documents/SubpartPP-SuppliersofCarbonDioxide.pdf>

Appendix C to Summary of Final Reporting Rule



Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments

Volume No.: 41

Subpart PP—Suppliers of Carbon Dioxide

Subpart PP—Suppliers of Carbon Dioxide

**U. S. Environmental Protection Agency
Office of Atmosphere Programs
Climate Change Division
Washington, D.C.**

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in most industrial applications eventually would be released to the atmosphere. 74 Fed. Reg.16584. CCS, however, is a qualitatively different enterprise: The goal is to avoid releases to the atmosphere. While more research is needed and is ongoing, available data indicates that appropriately sited and monitored geologic storage will not result in emissions to the air or to other environmental media. If EPA later determines that CCS, and, in particular, GS, should be subject to the proposed reporting rule, any reporting obligation should be consistent with the risk of CO₂ emissions throughout the CCS chain.

Response: This final rule does not require CO₂ transport, injection, or storage facilities to report under Subpart PP. However, given the comments received on the Subpart PP proposal, EPA plans to issue a new proposal on geologic sequestration. See the Preamble, Section III.PP for a discussion of this planned new proposal in *Definition of Source Category*. Thus, EPA is not taking a position on the statements in the comment regarding geologic sequestration at this time and will consider this comment in developing the new proposal.

Commenter Name: Thomas Siegrist

Commenter Affiliation: Koch Nitrogen Company LLC

Document Control Number: EPA-HQ-OAR-2008-0508-0351.1

Comment Excerpt Number: 10

Comment: KNC supports EPA's decision to exclude fugitive CO₂ emissions from the reporting requirements for ammonia production facilities, due to the low levels of fugitive emissions from these sources and the practical difficulty of estimating these emissions. EPA requested comments on its decision to exclude the reporting of fugitive carbon dioxide ("CO₂") emissions from the carbon capture and storage chain. 68 Fed. Reg. at 16583. As EPA states in the Preamble, less than 2 percent of the total supply of CO₂ from industrial facilities and CO₂ production wells comes from ammonia production facilities. *Id.* Thus, attempting to estimate fugitive CO₂ emissions from such a small portion of the carbon capture and storage chain would not significantly enhance the accuracy of GHG emissions estimates. Moreover, certification as to the accuracy of an estimate of such low levels of fugitive emissions would be problematic for reporting entities. Therefore, KNC agrees with EPA's decision to exclude the reporting of fugitive CO₂ emissions from this sector and recommends that this exclusion be retained in the final rule.

Response: See response to comment EPA-HQ-OAR-2008-0508-0408.1, excerpt 29.

Commenter Name: See Table 2

Commenter Affiliation:

Document Control Number: EPA-HQ-OAR-2008-0508-0679.1

Comment Excerpt Number: 247

Comment: EPA seeks "comment on the decision to exclude the reporting of fugitive CO₂ emissions from the carbon capture and storage chain [...] there could be merit in requiring the reporting of fugitive emissions from geological sequestration of CO₂, in particular." (p. 16583) API comments: API supports the decision to exclude the reporting of fugitive CO₂ emissions from the CCS chain broadly and specifically does not believe there is merit in requiring the reporting of fugitive emissions from geologic sequestration of CO₂ or EOR operations that utilize CO₂. API is concerned however that EPA does not appear to have a clear understanding

of the behavior of CO₂ when it is injected (usually in a supercritical state) into a geologic formation. EPA's discussion of the merits of reporting fugitive emissions from geologic sequestration suggests that EPA equates "retention rates" with only the volume of CO₂ that is locked in the geologic formation due to capillary trapping forces and that the remainder of the CO₂, the mobile portion, constitutes the potential fugitive emission. [footnote: In particular, EPA states (74 FR 68 16584) "This report could provide information on the amount of CO₂ sequestered based on the amount of CO₂ injected minus any fugitive emissions".] This is incorrect. Retention rate or storage rate should refer to the amount of CO₂ placed in a secure underground storage formation or that is used in an active EOR project at a given point in time. The CO₂ produced with the oil is recycled through the system; it is not lost to the atmosphere. Importantly, each time the CO₂ is cycled through the reservoir, additional CO₂ is added to supplement the recycled CO₂ to offset CO₂ trapped in the formation due to capillary forces and to replace displaced reservoir fluids, thus maintaining a constant injection volume at the EOR project. The "retention rate" EPA refers to in the Preamble does not adequately capture the fact that EOR is a "closed system." In fact, the report that EPA cites in their discussion of retention rates recognizes this fact and states that, regarding a reservoir with 38% retention, "Essentially 100% of the purchased CO₂ is still in the system. At the end essentially 100% of the fluid will be stored in a reservoir." Additionally, evidence suggests that CO₂ injected via EOR wells in compliance with the UIC regulations does not leak into the surrounding groundwater (Smyth et al, 2008; Wilson and Monea, 2004) let alone the atmosphere (Klusman, 2003; Wilson and Monea, 2004). References: Smyth et al. (2008) Update on Studies on Risk to Aquifers from CO₂ Sequestration Gulf Coast Carbon Center, Bureau of Economic Geology. [SACROC EOR project] Klusman, (2003) A geochemical perspective and assessment of leakage potential for a mature carbon dioxide-enhanced oil recovery project and as a prototype for carbon dioxide sequestration: Rangely field, Colorado. American Association of Petroleum Geologists Bulletin, 87(9), 1485-1507 [Rangely EOR project] Wilson and Monea (editors) (2004) IEA GHG Weyburn CO₂ Monitoring and Storage Project Summary Report 2000-2004 Petroleum Technology Research Center, Regina SK, Canada. [Weyburn EOR project]

Response: In the proposed Subpart PP preamble, EPA cited a study about the term "retention rate". EPA understands from commenters that "retention rate" is defined as the amount of CO₂ that is injected into the underground formation (oil field), while the EOR site is operating and producing oil, and that is not recovered with the oil, and has to do with the efficiency of the CO₂ recycling process at an operating EOR site. EPA did not intend to suggest that "retention" equates to the amount of CO₂ sequestered in an underground formation. While EPA understands that some amount of CO₂ injected into oil and gas reservoirs for EOR purposes will be trapped in the subsurface, EPA concludes that site-specific elements beyond geophysical trapping parameters influence the amount of CO₂ securely sequestered. See the Preamble, Section III.PP for a discussion of such elements in *Definition of Source Category*.

Given the comments received on the Subpart PP proposal, EPA plans to issue a new proposal on geologic sequestration and will address leakage in that proposal. See the Preamble, Section III.PP for a discussion of this planned new proposal in *Definition of Source Category*. EPA will consider this comment in developing the new proposal.

As stated in Section III.W of this preamble, EPA plans to take additional time to consider alternatives to data collection procedures and methodologies in the proposed 40 CFR part 98, subpart W and will consider inclusion of GHG reporting from other sectors of the oil and gas industry besides those proposed for reporting in proposed 40 CFR Part 98, subpart W. Fugitive emissions from EOR surface facility operations may be part of those considerations.

Comment: Because of the relative purity of the CO₂, some ethanol plants capture CO₂ from the fermentation process for sale in other industries. A 2007 survey showed over 23% of facilities reporting captured CO₂ emissions. These CO₂ emissions are generally sold for use in dry ice production and carbonated beverage bottling. For example, a facility in Milton, Wisconsin was reported to plan on capturing CO₂ from the fermentation process for sale to more than 50 customers in southern Wisconsin and northern Illinois who use CO₂ for “a hundred different applications” in the chemical, food-processing and beverage industries. Because biogenic sources of emissions are generally excluded from reporting, EPA should also exclude these captured emissions from reporting under Proposed Section 98.420(b). Moreover, these sales avoid additional new production of CO₂. At a minimum, EPA should clarify how these captured emissions, which are biogenic, should be reported.

Response: EPA has determined that information from all types of source categories that meet the reporting criteria in Subpart PP – including ethanol facilities – will be useful under this final rulemaking. As a result, this final rule requires the reporting of data on capture of biogenic CO₂. See the Preamble, Section III.PP for our response to a comment on exempting captured biogenic CO₂ in *Definition of Source Category*.

Commenter Name: Traylor Champion
Commenter Affiliation: Georgia-Pacific, LLC (GP)
Document Control Number: EPA-HQ-OAR-2008-0508-0380.1
Comment Excerpt Number: 40

Comment: Based on the analysis of this source category described in the preamble and the definition of the source category given under the rule as well as the discussion in the pulp and paper technical support document, GP believes that pulp and paper mills piping an exhaust stream, most likely from lime kilns or calciners, to an adjacent PCC plant for use as a raw material are not considered “Suppliers of Carbon Dioxide.” CO₂ is not separated and removed from a manufacturing process as described in the definition of the source category in §98.420(a)(1). However, for clarification, GP requests EPA categorically exempt pulp and paper mills exporting an exhaust stream to a PCC plant under §98.420(b).

Response: EPA does not agree that pulp and paper mills are not “Suppliers of Carbon Dioxide”. CO₂ “captured” at pulp and paper mills and transferred to another entity for downstream processing for the purposes of producing a commercial product must be reported under Subpart PP. EPA is requiring entities that produce or capture CO₂ to report the amount of CO₂ supply regardless of the ultimate use of the CO₂. See Preamble Section III.PP.3 for rationale on this decision.

Commenter Name: Bill Grygar
Commenter Affiliation: Anadarko Petroleum Corporation
Document Control Number: EPA-HQ-OAR-2008-0508-0459.1
Comment Excerpt Number: 24

Comment: EPA should not require reporting under Subpart PP for CO₂ used for enhanced oil recovery (“EOR”). Anadarko operates one of the largest EOR/geologic sequestration projects in the world in Wyoming. EOR operations are “closed systems” in that the CO₂ never is intentionally released into the environment. It is unclear, and EPA offers no explanation, of how

collecting information on CO₂ production will “assist EPA and others in developing future climate policy” (74 Fed. Reg. 68, page 16456).

Response: In this final rule, EPA is requiring entities that produce or capture CO₂ to report the amount of CO₂ supply regardless of the ultimate use of the CO₂. EPA did not intend to characterize all CO₂ supplied to the economy as emissions and recognizes that there are a variety of applications for CO₂, both emissive and non-emissive. However, the Administrator believes that upstream suppliers have information that is necessary for purposes of carrying out an evaluation of how to use the CAA to address GHG emissions and climate change. Emissions data are not limited to information regarding the actual level of emissions from a smokestack. See the Preamble, Section 3 for a discussion of EPA’s legal authority under the heading *Clean Air Act*.

Given the comments received on the Subpart PP proposal, EPA plans to issue a new proposal on geologic sequestration. See the Preamble, Section III.PP for a discussion of this planned new proposal in *Definition of Source Category*.

For our response to comments on how CO₂ supply data will assist EPA in developing future climate policy, please see the Preamble, Section III.PP under the heading *Definition of Source Category*.

Commenter Name: Angela Burckhalter

Commenter Affiliation: Oklahoma Independent Petroleum Association (OIPA)

Document Control Number: EPA-HQ-OAR-2008-0508-0386.1

Comment Excerpt Number: 33

Comment: EPA proposes to exclude the reporting of CO₂ fugitive emissions from CO₂ supplies at industrial facilities or process units, CO₂ production wells, as well as from CO₂ pipelines, injection wells and storage sites. We think requiring the reporting of emissions from enhanced oil recovery (EOR) applications using CO₂ will deter operators from using CO₂ in this application which ultimately sequesters some CO₂ in the process. We think it is unnecessarily burdensome for those operators of CO₂ EOR projects and we agree that EPA should exclude them from the reporting requirements.

Response: For a response on excluding fugitive emissions from Subpart PP, see an earlier response to comment in this document, comment EPA-HQ-OAR-2008-0508-0459.1, excerpt 29.

This final rule does not require CO₂ transport, injection, or storage facilities to report under Subpart PP. Given the comments received on the Subpart PP proposal, EPA plans to issue a new proposal on geologic sequestration. See the Preamble, Section III.PP for a discussion of this planned new proposal in *Definition of Source Category*. Thus, EPA is not taking a position on the statements in the comment regarding geologic sequestration at this time and will consider this comment in developing the new proposal.

Commenter Name: See Table 2

Commenter Affiliation:

Document Control Number: EPA-HQ-OAR-2008-0508-0679.1

Comment Excerpt Number: 250

the CO₂ is ultimately released into the atmosphere, limestone is inherently stable and the CO₂ is never emitted back into the atmosphere during subsequent use and disposal. For this reason, we contend that pulp and paper mills exporting CO₂ to PCC plants be categorically exempted from reporting requirements as “Suppliers of CO₂”.

Response: See response to comment EPA-HQ-OAR-2008-0508-0380.1, excerpt 40.

Commenter Name: See Table 2

Commenter Affiliation:

Document Control Number: EPA-HQ-OAR-2008-0508-0679.1

Comment Excerpt Number: 253

Comment: §98.420 Definition of the source category. a)(1) Production process units that capture a CO₂ stream for purposes of supplying CO₂ for commercial applications. (a)(2) Facilities with CO₂ production wells. API Comment: EPA should not require reporting for either of these categories if the CO₂ is used for EOR operations, which are “closed systems”. It is unclear – and EPA offers no explanation – of how collecting information on CO₂ production will “assist EPA and others in developing future climate policy” (74 FR 68, page 16456). The captured or produced CO₂ utilized in EOR operations is transported to an oil field where it is injected into a hydrocarbon reservoir. A significant fraction (about 1/3) of the CO₂ will be trapped in the hydrocarbon formation due to capillary forces. The remainder moves through the reservoir, mixing with and mobilizing the oil. The CO₂ produced with the hydrocarbons is separated, recovered, compressed, and re-injected into the hydrocarbon formation. EPA’s own methodology recognizes that the CO₂ is managed within a closed system and therefore not released into the atmosphere – “The naturally-occurring CO₂ used in EOR operations is assumed to be fully sequestered.” Box 3-3 of EPA’s Inventory of US GHG Emissions and Sinks: 1990-2006).

Response: EPA did not intend to characterize all CO₂ supplied to the economy as emissions and recognizes that there are a variety of applications for CO₂, both emissive and non-emissive. However, the Administrator believes that upstream suppliers have information that is necessary for purposes of carrying out an evaluation of how to use the CAA to address GHG emissions and climate change. Emissions data are not limited to information regarding the actual level of emissions from a smokestack. See the Preamble, Section 3 for a discussion of EPA’s legal authority under the heading *Clean Air Act*.

While EPA understands that some amount of CO₂ injected into oil and gas reservoirs for EOR purposes will be trapped in the subsurface, EPA concludes that site-specific elements beyond geophysical trapping parameters influence the amount of CO₂ securely sequestered. See the Preamble, Section III.PP for a discussion of such elements in *Definition of Source Category*.

EPA’s Inventory of US GHG Emissions and Sinks: 1990-2006 assumes that CO₂ used in EOR operations is fully sequestered. However, In the Subpart PP TSD, EPA reflected a newer provisional accounting convention, based on the 2006 IPCC Guidelines Reporting Convention suggested approach, that counts a potential CO₂ source as emitted until nationally accepted protocols are developed for measurement, verification and reporting. EPA plans to issue a new proposal on geologic sequestration. See the Preamble, Section III.PP for a discussion of this planned new proposal in *Definition of Source Category*. Thus, EPA is not taking a position on

the statements in the comment regarding geologic sequestration at this time and will consider this comment in developing the new proposal.

For information on how CO₂ supply will assist EPA in developing future climate policy, please see the Preamble in *Definition of Source Category*.

Commenter Name: See Table 4

Commenter Affiliation:

Document Control Number: EPA-HQ-OAR-2008-0508-0635

Comment Excerpt Number: 85

Comment: Although the draft rule and preamble generally group projects types as “sources” that either extract or capture CO₂, we point out that not all of the CO₂ that would be reported from those sources is necessarily an “emission” into the atmosphere. As the rule preamble correctly points out, some of it is used in industrial applications that eventually lead to its release (such as carbonated beverages), while the largest part is injected underground for enhanced oil recovery (EOR) operations for the primary purpose of maximizing oil production. 346 Therefore, it is important for the proposed rule to provide a mechanism for suppliers of CO₂ or other operators to demonstrate which pathway the produced or captured CO₂ follows: to the atmosphere or to the subsurface. As currently written, the proposed rule does not do this, and should be modified.

Response: EPA did not intend to characterize all CO₂ supplied to the economy as emissions and recognizes that there are a variety of applications for CO₂, both emissive and non-emissive. In this final rule, EPA is requiring reporting on the end-use of the CO₂ supplied, if known.

While EPA understands that some amount of CO₂ injected into oil and gas reservoirs for EOR purposes will be trapped in the subsurface, EPA concludes that site-specific elements beyond geophysical trapping parameters influence the amount of CO₂ securely sequestered. See the Preamble, Section III.PP for a discussion of such elements in *Definition of Source Category*.

EPA plans to issue a new proposal on geologic sequestration. See the Preamble, Section III.PP for a discussion of this planned new proposal in *Definition of Source Category*. Thus, EPA is not taking a position on the statements in the comment regarding geologic sequestration at this time and will consider this comment in developing the new proposal.

Commenter Name: Tiffany Rau

Commenter Affiliation: Hydrogen Energy International LLC (HEI)

Document Control Number: EPA-HQ-OAR-2008-0508-0517.1

Comment Excerpt Number: 5

Comment: EPA proposes to require reporting from facilities that produce a CO₂ stream from CO₂ production wells. (Proposed Rule § 98.420(2); 74 FR 16584.) HEI interprets this to apply to production facilities of naturally-occurring CO₂ accumulations. HEI kindly requests that EPA confirm this interpretation.

Response: EPA concurs that Subpart PP is intended to apply to production of naturally occurring CO₂ from CO₂ production wells.

Commenter Name: Karen St. John
Commenter Affiliation: BP America Inc. (BP)
Document Control Number: EPA-HQ-OAR-2008-0508-0631.1
Comment Excerpt Number: 110

Comment: EPA proposes to require reporting from facilities that produce a CO₂ stream from CO₂ production wells. (Proposed Rule § 98.420(2); 74 FR 16584.) BP interprets this to apply to production facilities of naturally-occurring CO₂ accumulations. BP requests that EPA confirm this interpretation.

Response: See response to comment EPA-HQ-OAR-2008-0508-0517.1, excerpt 5.

Commenter Name: Ronald T. Evans
Commenter Affiliation: Denbury Resources, Inc.
Document Control Number: EPA-HQ-OAR-2008-0508-0484.1
Comment Excerpt Number: 2

Comment: The erroneous statement in the Technical Supporting Document that “assumes” the emission of CO₂ injected for EOR operations should be corrected. The Technical Support Document for CO₂ suppliers states that it “assumes” that CO₂ that is captured from anthropogenic facilities sources or extracted from naturally-occurring formations is emitted to the atmosphere from the downstream systems in which the CO₂ is used.[Footnote: Subpart PP, “Technical Support Document For CO₂ Supply: Proposed Rule For Mandatory Reporting Of Greenhouse Gases”, at 7 (noting that “it is assumed that the entire amount of the captured or extracted CO₂ that is transferred off site is assumed to be emitted to the atmosphere from downstream systems in which the CO₂ is used”).] This statement appears to have been intended to reflect a provisional accounting convention (i.e. based on the IPCC’s suggested approach for counting a potential CO₂ source as emitted until nationally accepted protocols are developed for measurement, verification and reporting). As a factual matter, however, the statement is inaccurate, as indeed is recognized in other EPA documents (including the preamble to the proposed rule here), and in multiple scientific and industry studies and reports. We would accordingly urge the EPA to correct this misstatement because the failure to do so could create public confusion regarding incidental storage of CO₂ that is injected in enhanced oil recovery operations.

As the EPA is well aware, the production, transportation, injection and recycling of naturally-occurring CO₂ for EOR purposes is a “closed system” in which the CO₂ is never intentionally emitted to the atmosphere. Rather, the CO₂ is produced and then transported in a closed pipeline system to the injection points and injected underground, following which a portion returns to the surface with the produced oil where it is separated, re-compressed and recycled into the reservoir. The process continues for as long as oil production is economical at which point all of the CO₂ that is in the depleted oil formation remains stored underground (unless it is subsequently produced and transported for injection and subsequent recycling in another EOR field).[Footnote: For more detail, please see Comments of Denbury Resources, Inc. filed December 22, 2008 in Docket ID No. EPA-HQ-OW-2008-0390 (proposed rule on Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO₂) Geologic Sequestration (GS) Wells) (<http://www.regulations.gov/fdmspublic/component/main?main=DocumentDetail&o=09000064>)

807e8f80).] While EPA is reviewing proposed rule changes in its UIC program to create standards for geologic sequestration sites, those requirements are largely aimed at confirming that the injected CO₂ does not in fact migrate into underground sources of drinking water or to the surface and at site maintenance and monitoring long after CO₂ injections have ceased. There appears to be confusion over the term “retention rate” of CO₂ in EOR operations.

The proposed rule says that “some” amount of CO₂ could ultimately be sequestered in EOR operations. 74 Fed. Reg. at 16583-16584. The NOPR cites to a study of retention rates ranging from 38 to 100 percent, but concludes that many of those projects were not mature enough to predict final retention. *Id.* at 16584. The NOPR appears to confuse the efficiency of CO₂ recycling in a given field with the ultimate disposition of the CO₂ that is underground at the time oil production operations are completed. The more efficient the CO₂ EOR operations in a given field, the fewer units of incremental CO₂ are required to recover a given number of barrels of oil. A highly efficient CO₂ EOR operation means that the “retention rate” will be lower in the sense that a lesser amount of new CO₂ is required to be added to the field because the CO₂ is more efficient at recovering oil and thus less CO₂ is actually recycled over time. In water alternating gas CO₂ EOR operations (“WAG” EOR), generally equal quantities of water are injected and thus the apparent “retention factor” is less than if an operator only injects CO₂ with no water. Although each project is different, the range of CO₂ injected (required external CO₂, not including recycled CO₂) to produce a barrel of oil ranges between four to 12 thousand cubic feet (Mcf). [Footnote: See Statement of Gareth Roberts on behalf of Denbury Resources, Inc. before the Joint Meeting on Carbon Issues of the House Committee on Energy Resources and the House Committee on Environmental Regulation of the Texas Legislature (March 11, 2009), at 4.] Thus the “retention rate” of the CO₂ EOR project also ranges from four to 12 Mcf per barrel and essentially 100% of the injected CO₂ is ultimately sequestered. The only CO₂ that is not permanently sequestered would be those volumes that may be released due to equipment failure.

Historically these volumes are very minimal. Nevertheless, even where the retention rate is relatively low, however, virtually 100 percent of the CO₂ that is injected in a field at the time production operations come to a close remains stored underground. This is why it is accurate to say that CO₂ is incidentally and indefinitely stored or sequestered in the context of EOR operations. The exception would be if the original CO₂ injection (or oil production) wells were subsequently re-entered in order to try to produce CO₂ from the storage formation for reinjection in yet another field. Because of the various physical and chemical trapping mechanisms that occur over time, however, the longer a field remains fallow, the less likely that the previously-injected CO₂ could be recovered economically. [Footnote: Intergovernmental Panel On Climate Change, Special Report On Carbon Dioxide Capture And Storage, (Bert Metz, ed., Cambridge University Press 2005), at 206-210 (available at <http://www.ipcc.ch/ipccreports/special-reports.htm> (“IPCC Special Report on CCS”).]

This incidental storage of CO₂ has been conducted for nearly four decades in the context of EOR operations by many thousands of existing CO₂ injection and production wells. It is a process that is well understood and documented and the some 13,000 or so CO₂ wells are regulated by the state oil and gas conservation commission or environmental regulator where such EOR operations take place. The activity is also subject to various other regulatory statutes administered by the EPA for the protection of underground sources of drinking water, etc. [Footnote: Meyer, “Summary of Carbon Dioxide Enhanced Oil Recovery (CO₂ EOR) Injection Well Technology,” (EPA Document Identification: EPAHQ-OW-2008-0390-001 8), prepared for the American Petroleum Institute (published by API September 18, 2007), at vi (EPA Document Identification: EPA-HQ-OW2008-0390-0018) (available from Ground Water

Protection Council website at:

[http://www.gwpc.org/elibrary/documents/CO₂/API%20CO₂%20Report.pdf](http://www.gwpc.org/elibrary/documents/CO2/API%20CO2%20Report.pdf)). See also John A. Veil and Markus G. Puder, “Evaluation of State and Regional Resource Needs to Manage Carbon Sequestration through Injection” (June 2007) (EPA Document Identification EPA-HQ-OW-2008-0390-0084.pdf) (available also from the Ground Water Protection Council’s website at:

[http://www.gwpc.org/elibrary/documents/general/Argonne%20Report%20CO₂%20Resources.pdf](http://www.gwpc.org/elibrary/documents/general/Argonne%20Report%20CO2%20Resources.pdf) (visited June 9, 2009) at 8 (Table 3) (listing CO₂ injection wells by state and by UIC well class)). The number of active CO₂ injection wells is also published in the Annual Production Report, Oil & Gas Journal, vol. 106, (Apr. 21, 2008).] The IPCC’s Special Report on CCS has noted that the fraction of CO₂ retained in properly selected and managed geologic reservoirs is very likely to exceed 99% over 100 years and is likely to exceed 99 % over 1000 years.

[Footnote: d., at 34 (“ the fraction retained in appropriately selected and managed reservoirs is very likely to exceed 99% over 100 years, and is likely to exceed 99% over 1000 years”)

(footnote omitted) risk of leakage “is expected to decrease over time as other mechanisms provide additional trapping”). See generally Chapter 5 of the IPCC Special Report on CCS.] Hence, there is simply no basis for “assuming” in the Technical Support Document that CO₂ produced for EOR operations will be emitted to the atmosphere following capture or extraction. Reflecting this, EPA’s own accounting methodology for greenhouse gas inventories correctly distinguishes between CO₂ that is used in non-EOR operations (which is assumed to be emitted to the atmosphere during industrial uses in food processing, chemical production and the like) and CO₂ that is used in EOR operations, which EPA assumes to be “fully sequestered”.

[Footnote: EPA, “Inventory Of U.S. Greenhouse Gas Emissions And Sinks: 1990-2007” (April 2009), at page 3-46 (Box 3-3) (available at

<http://epa.gov/climatechange/emissions/downloads09/Energy.pdf> (separate link to chapter 3 “Energy”)). The April 2009 inventory report also includes an accounting estimate (in effect a kind of “placeholder” estimate) of CO₂ injections for EOR, pending EPA’s development of site-specific monitoring and reporting data for CO₂ injection sites (i.e., EOR operations). This entry (in Tables 3-43 and 3-44) appears to assume for accounting purposes that all CO₂ injected for EOR is emitted, pending the development of additional monitoring and reporting rules. In effect, this merely means that the United States Government has not yet developed nationally recognized standards and protocols consistent with the IPCC Guidelines, not that the injected CO₂ is in fact emitted to the atmosphere.] Similarly, the IPCC’s 2006 Guidelines for National Greenhouse Gas Inventories notes that there is “no evidence” of leakage or escape of injected CO₂ at the fully monitored sites discussed there and a potential but minimal (less than 0.02 percent) leakage at another site. [Footnote: IPCC, Guidelines for National Greenhouse Gas Inventories (2006) (ed. Eggleston, Buendia, Miwa, Ngara and Tanabe), at 5.17. There was a reported emission of less than 0.02 percent (less than two-hundredths of one percent) at one site, which was “likely” due in part if not entirely to methane releases, was possibly due in part to the CO₂ injections. Id.] Accordingly, we would urge the EPA in the preamble to its final rule here to be very clear in stating that it does not assume that that CO₂ produced, transported and injected in geologic formations during EOR operations is emitted to the atmosphere.

Response: For a response to comment about using IPCC accounting convention and about plans for a new proposal on sequestration, [see response to comment EPA-HQ-OAR-2008-0508-0679.1, excerpt 253.](#)

In the proposed Subpart PP preamble, EPA cited a study about the term “[retention rate](#)”. EPA understands from commenters that “retention rate” is defined as the amount of CO₂ that is injected into the underground formation (oil field), while the EOR site is operating and

producing oil, and that is not recovered with the oil, and has to do with the efficiency of the CO₂ recycling process at an operating EOR site. EPA did not intend to suggest that “retention” equates to the amount of CO₂ sequestered in an underground formation. While EPA understands that some amount of CO₂ injected into oil and gas reservoirs for EOR purposes will be trapped in the subsurface, EPA concludes that site-specific elements beyond geophysical trapping parameters influence the amount of CO₂ securely sequestered. See the Preamble, Section III.PP for a discussion of such elements in *Definition of Source Category*.

In response to comments about the objectives of the UIC program, that issue is outside the scope of this rulemaking. It is EPA’s strong intention to harmonize CCS requirements across relevant statutory or other programs in order to minimize any redundancy and any burden on reporters. See the Preamble, Section III.PP for a discussion of harmonizing efforts in *Definition of Source Category*.

Commenter Name: Philip Marston
Commenter Affiliation: Denbury Resources
Document Control Number: EPA-HQ-OAR-2008-0508-0212.1e
Comment Excerpt Number: 1

Comment: The very narrow issue that I just wanted to flag for you today is in the technical support document at page 7, it says that all of the entire amount of CO₂ that is produced from a naturally occurring formation and is transferred off site is assumed to be emitted into the atmosphere, and that is not the way the system works. I understand that that may perhaps be sort of a counting convention, but I am concerned that the public record reflect the underlying facts. We are dealing with a closed system. That doesn't mean that there can't be leaks in the system, and I am sure that when the time for written comments come, there will be some comments on the details of how you measure here and the like. Those are details, but the fundamental point is the CO₂ is produced from underground, brought to the surface. It is in a continuous pipeline. It is compressed to a super critical phase, which has the characteristics of both gas and liquid. It is carried in the pipeline, and then it is injected underground into the oil and formations. The CO₂ causes the oil droplets to expand. It reduces the surface tension that holds the oil to the lock and allows the sweep of the oil to then come back to the oil-producing well, comes up to the surface with the CO₂. The CO₂ is separated from the oil. The oil is then taken to market. The CO₂ that you have spent a lot of time and effort to acquire is then recycled. So the object of the exercise is since the CO₂ is a scarce resource and a commodity, you want to reuse it as often as you can. So you want to recycle the CO₂ back down into the formation, or you may take it to another formation that may be 50 or 100 miles away. You put it back in your pipeline system. It may stay underground for a period of time. Then you may take it back out and take it to another formation. But in all of that, it is a closed system, and at the end of the day, the CO₂ that is injected, but for leaks that may occur, there may be pipeline ruptures, et cetera, the system is basically a closed system. So the consequences of dealing with that were ramified through the comments, but I just wanted to make it real clear that it is a closed system.

Response: See response to the comment directly above, comment EPA-HQ-OAR-2008-0508-0484.1, excerpt 2.

Commenter Name: William C. Herz
Commenter Affiliation: The Fertilizer Institute (TFI)

Document Control Number: EPA-HQ-OAR-2008-0508-0952.1

Comment Excerpt Number: 28

Comment: Subpart PP of the NPRM requires “mass flow meters” to be installed to measure the CO₂ quantity. 74 Fed. Reg. at 16,725. TFI contends that this requirement should be eliminated for an ammonia manufacturing facility with on-site urea manufacturing because the quantity of CO₂ being consumed can easily be quantified through estimation methods based on the urea manufacturing process. Existing volumetric flow monitors are sufficient to determine the quantity of CO₂ being consumed in urea plants.

Response: EPA concurs with this comment. See the Preamble, Section III.PP for the response to comment on *Monitoring and QA/QC Requirements*.

Commenter Name: William A. Collins, Jr

Commenter Affiliation: Occidental Petroleum Corporation

Document Control Number: EPA-HQ-OAR-2008-0508-0452

Comment Excerpt Number: 7

Comment: EPA’s proposal to require reporting of the entire mass of CO₂ from CO₂ suppliers as “emissions” is factually and legally inappropriate. The rationale provided in EPA’s preamble to Subpart PP, as supported by the stated assumption in the TSD, cannot be reconciled with EPA’s acknowledgement that up to 100 percent of CO₂ used in EOR operations in the Permian Basin is retained in the geologic formation and not emitted to the atmosphere. All of the CO₂ produced from Occidental’s interests in the CO₂ domes cited in the preamble is used for Occidental’s EOR operations in the Permian Basin, and, as EPA notes, essentially all of that amount is ultimately retained in the geologic formation into which it is injected. It would be factually incorrect to require that these significant volumes of supplied CO₂ be reported as emissions to the atmosphere. Moreover, the rule would require Occidental’s designated representative to certify under penalty of law, including fine or imprisonment, that these volumes of CO₂ are emissions, when Occidental’s representative is aware that the volumes are in fact not emissions. EPA’s proposed Subpart PP creates a “catch-22” situation where fulfillment of the reporting obligation becomes impossible, exposing the company to enforcement action and Occidental’s management to personal liability. Occidental agrees with EPA’s desire to measure the volumes of CO₂ supplied by such facilities for the purpose of providing valuable information on fugitive and related emissions associated with CO₂EOR and future CCS activities. However, the mass of CO₂ generated by suppliers should not be reported as emissions, and this Mandatory Reporting Rule is not the appropriate vehicle for gathering such data. Occidental recommends that EPA either propose Subpart PP as a non-certified demonstration reporting measure of captured volumes (as opposed to emissions), or propose a separate voluntary reporting protocol for CO₂ suppliers. Occidental does not believe the exclusion of supplied volumes from this rulemaking will hamper EPA’s GHG reporting objectives, as EPA’s proposed rule can or will require reporting by parties purchasing or using supplied CO₂ volumes.

Response: EPA did not intend to characterize all CO₂ supplied to the economy as emissions and recognizes that there are a variety of applications for CO₂, both emissive and non-emissive. However, the Administrator believes that upstream suppliers have information that is necessary for purposes of carrying out an evaluation of how to use the CAA to address GHG emissions and climate change. Emissions data are not limited to information regarding the actual level of

emissions from a smokestack. See the Preamble, Section 3 for a discussion of EPA's legal authority under the heading *Clean Air Act*.

In Subpart PP of the proposed rule, EPA considered many points within the CO₂ supply chain for reporting. EPA decided to require reporting from production process units and from facilities with CO₂ production at the point of capture and prior to any subsequent purification, processing, or compressing in order to collect accurate data on the amount of CO₂ captured prior to any downstream losses. In addition, selecting this coverage maximizes accuracy and completeness and minimizes the number of sources required to report and the overall reporting burden. This rationale applies to the final rule.

While EPA understands that some amount of CO₂ injected into oil and gas reservoirs for EOR purposes will be trapped in the subsurface, EPA concludes that site-specific elements beyond geophysical trapping parameters influence the amount of CO₂ securely sequestered. See the Preamble, Section III.PP for a discussion of such elements in *Definition of Source Category*.

EPA plans to issue a new proposal on geologic sequestration. See the Preamble, Section III.PP for a discussion of this planned new proposal in *Definition of Source Category*. Thus, EPA is not taking a position on the statements in the comment regarding geologic sequestration at this time and will consider this comment in developing the new proposal.

Commenter Name: Rich Raiders

Commenter Affiliation: Arkema Inc.

Document Control Number: EPA-HQ-OAR-2008-0508-0511.1

Comment Excerpt Number: 69

Comment: EPA should remove the § 98.420(b)(6) exclusion that allows importers of equipment containing CO₂ from reporting in the proposed system. Domestic manufacturers of such equipment are at a competitive disadvantage if CO₂ is reported by importers with whom they compete are excluded from reporting. Such a system unfairly rewards leakage of CO₂ generation outside the United States.

Response: EPA proposed that importers of equipment containing CO₂ would be excluded as covered entities under Subpart PP. In the proposed rule, EPA did a careful evaluation of all suppliers of CO₂ and selected reporters in order to strike a balance between coverage and burden. EPA selected production process units and facilities with CO₂ production wells because together they account for the vast majority of CO₂ supplied to the economy and used downstream by end-users. Furthermore, EPA concluded that all production process units identified for the proposed rule would be required to report as downstream sources under another Subpart of this rule anyway given their downstream emissions. EPA decided to exclude importers of equipment containing CO₂ because the amount of CO₂ supply is not significant enough to warrant the additional reporting burden that it would have imposed on a potentially large number of sources. This rationale applies to the final rule.

Domestic manufacturers of equipment containing CO₂ are not required to report under Subpart PP of the final rule; the supplier of the CO₂ contained in such equipment is required to report.

Comment: Add to proposed section 98.421 a new paragraph at the end to read: “and any geologic sequestration operation and any enhanced hydrocarbon recovery operation shall report amounts of CO₂ (and incidental other material, if included in the injectate) injected and amounts of CO₂ extracted.”

Response: See the response to the comment directly below, comment EPA-HQ-OAR-2008-0508-0635, excerpt 91.

3. GHGS TO REPORT

Commenter Name: See Table 4

Commenter Affiliation:

Document Control Number: EPA-HQ-OAR-2008-0508-0635

Comment Excerpt Number: 91

Comment: Add to the end of proposed paragraph 98.422 the following language: “For geologic sequestration and enhanced hydrocarbon recovery operations, you must report the amount of CO₂ (and incidental other material, if included in the injectate) injected and amounts of CO₂ extracted.”

Response: This final rule does not require CO₂ transport, injection, or storage facilities to report under Subpart PP. Given the comments received on the Subpart PP proposal, EPA plans to issue a new proposal on geologic sequestration. See the Preamble, Section III.PP for a discussion of this planned new proposal in *Definition of Source Category*. Thus, EPA is not taking a position on the statements in the comment regarding geologic sequestration at this time and will consider this comment in developing the new proposal.

Commenter Name: Marc J. Meteyer

Commenter Affiliation: Compressed Gas Association (CGA)

Document Control Number: EPA-HQ-OAR-2008-0508-0981.1

Comment Excerpt Number: 77

Comment: The CGA member companies support the view of excluding the monitoring and reporting of fugitive emissions under the regulations. The reporting thresholds that have been selected are expected to cover approximately 85-90% of all national emissions and represent an excellent balance between accuracy of data reported and cost for compliance. We believe that inclusion of fugitive emissions will require significant extra cost for compliance with little upside benefit.

Response: See response to comment EPA-HQ-OAR-2008-0508-0408.1, excerpt 29.

Document Control Number: EPA-HQ-OAR-2008-0508-0981.1

Comment Excerpt Number: 70

Comment: §98.426 We appreciate the fact the EPA has recognized that some CO₂ will be chemically changed or sequestered, hence not emitted to the atmosphere, and that some CO₂ will be emitted to the atmosphere (preamble page 717). The CO₂ captured from a production process and reported under Subpart PP, has already been reported under other subparts of the rule. The inclusion of captured CO₂ in Subpart PP appears to be for purposes of determining the total amounts going to the end use applications listed in 98.426. However, the CGA respectfully submits that companies which produce and capture CO₂ do not have access to the data on CO₂ transferred to end use applications. This end use information is impossible to know at the point of “capture ... for purposes of supplying CO₂ for commercial applications”. The CGA respectfully submits that this information is also impossible to collect at a liquefaction facility level as CO₂ would be shipped via a variety of means (cylinder, trucks, railcars, depots for further distribution) and some would be supplied to other companies who either would not be privy to end use data, or would not share that end use data with their own supplier. Also, there would be multiple liquefaction plants feeding into CO₂ depots, so providing the level of molecule traceability to end use applications, at the emission source or on a facility level, is virtually impossible. Subpart PP, section 98.426 requires the reporting of quantities sold to several listed end use categories. Since CO₂ producers (those that own or operate a production process where CO₂ is captured) and owners of CO₂ production wells must report this data, and since they are often not the entity that processes the captured CO₂ and sells it to end users, this section of the rule will require downstream CO₂ processors (CGA member companies) to divulge their sales data, by market segment, to the CO₂ producers and CO₂ production well owners. The CGA considers this information to be CBI. Also, where a CO₂ producer or an owner of a CO₂ production well sells captured CO₂ to multiple downstream CO₂ processors, the potential for confidential business information of a processor to be passed on to a competitor is significant. Since the plant throughput (i.e., flowmeter data) or sales data (see alternative suggestion below) of CGA member companies would pass through third parties for submittal to EPA, the confidentiality of that information cannot be controlled. Therefore, the CGA membership strenuously objects to any section of the rule which requires the reporting of our CBI by CO₂ producers/captors. CGA would be willing to work with the EPA to determine the best means of generating the information requested without breaching company confidentiality.

Response: Subpart PP of this final rule does not require reporting from facilities that liquefy or purify CO₂ that has already been separated or removed from a manufacturing process or already extracted from production wells. See the Preamble, Section III.PP for a discussion of covered entities in *Definition of Source Category*.

Subpart PP of this final rule required that covered entities report the aggregated annual quantity of CO₂ that is transferred to each of 13 end use applications, if known. Since the data is to be reported aggregated and by end-use application rather than by customer, and since reporting is required only if the information is known, EPA has concluded that this is a reasonable reporting requirement. Please see Preamble section II.R for more information about CBI.

Commenter Name: Kim Dang

Commenter Affiliation: Kinder Morgan Energy Partners, L.P.

Document Control Number: EPA-HQ-OAR-2008-0508-0370.1

Comment Excerpt Number: 9