§ 98.474 Monitoring and QA/QC requirements.

(a) CO₂ received.

(1) You must determine the quarterly flow rate of CO₂ received by pipeline by following the most appropriate of the following procedures:

(i) You may measure flow rate at the receiving custody transfer meter prior to any subsequent processing operations at the facility and collect the flow rate quarterly.

(ii) If you took ownership of the CO₂ in a commercial transaction, you may use the quarterly flow rate data from the sales contract if it is an ongoing commercial transaction with discrete shipments.

Where:

\[ \text{CO}_2 = \sum_{r=1}^{g} \text{CO}_2 \text{T,r} \quad \text{(Eq. UU-3)} \]

Where:

\[ \text{CO}_2 \text{T,r} = \text{Net annual mass of CO}_2 \text{ received through flow meter r (metric tons)}. \]
\[ Q_{r,p} = \text{Quarterly volumetric flow through a receiving flow meter r in quarter p at standard conditions (standard cubic meters)}. \]
\[ S_{r,p} = \text{Quarterly volumetric flow through a receiving flow meter r that is redelivered to another facility without being injected into your well in quarter p (standard cubic meters)}. \]
\[ D = \text{Density of CO}_2 \text{ at standard conditions (metric tons per standard cubic meter): 0.0018704}. \]

(3) If you receive CO₂ through more than one flow meter, you must sum the mass of all CO₂ received in accordance with the procedure specified in Equation UU-3 of this section.

Where:

\[ \text{CO}_2T,r = \text{Net annual mass of CO}_2 \text{ received (metric tons) as calculated in Equation UU-1 or UU-2 for flow meter r}. \]
\[ r = \text{Receiving flow meter}. \]

(b) You must calculate and report the annual mass of CO₂ received in containers using the procedures specified in either paragraph (b)(1) or (b)(2) of this section.

(1) If you are measuring the mass of contents in a container under the provisions of §98.474(a)(2)(i), you must calculate the CO₂ received in containers using Equation UU-1 of this section.

Where:

\[ \text{CO}_2T,r = \text{Annual mass of CO}_2 \text{ received in containers r (metric tons)}. \]
\[ \text{C}_{\text{CO}_2,p} = \text{Quarterly CO}_2 \text{ concentration measurement in flow for flow meter r in quarter p (vol. percent CO}_2 \text{, expressed as a decimal fraction)}. \]
\[ p = \text{Quarter of the year}. \]
\[ r = \text{Receiving flow meter}. \]

(2) If you are measuring the volume of contents in a container under the provisions of §98.474(a)(2)(ii), you must calculate the CO₂ received in containers using Equation UU-2 of this section.

Where:

\[ \text{C}_{\text{CO}_2,p} = \text{Quarterly CO}_2 \text{ concentration measurement of contents in containers r in quarter p (vol. percent CO}_2 \text{, expressed as a decimal fraction)}. \]
\[ p = \text{Quarter of the year}. \]
\[ r = \text{Containers}. \]
(iii) If you inject \( \text{CO}_2 \) from a production process unit that is part of your facility, you may use the quarterly \( \text{CO}_2 \) flow rate that was measured at the equivalent of a custody transfer meter following procedures provided in subpart PP of this part. To be the equivalent of a custody transfer meter, a meter must measure the flow of \( \text{CO}_2 \) being transported to an injection well to the same degree of accuracy as a meter used for commercial transactions.

(2) You must determine the quarterly mass or volume of contents in all containers if you receive \( \text{CO}_2 \) in containers by the most appropriate of the following procedures:

(i) You may measure the mass of contents of containers summed quarterly using weigh bills, scales, or load cells.

(ii) You may determine the volume of the contents of containers summed quarterly.

(iii) If you took ownership of the \( \text{CO}_2 \) in a commercial transaction, you may use the quarterly mass or volume of contents from the sales contract if it is a one-time transaction or from invoices or manifests if it is an ongoing commercial transaction with discrete shipments.

(3) You must determine a quarterly concentration of the \( \text{CO}_2 \) received that is representative of all \( \text{CO}_2 \) received in that quarter by following the most appropriate of the following procedures:

(i) You may sample the \( \text{CO}_2 \) stream at least once per quarter at the point of receipt and measure its \( \text{CO}_2 \) concentration.

(ii) If you took ownership of the \( \text{CO}_2 \) in a commercial transaction for which the sales contract was contingent on \( \text{CO}_2 \) concentration, and if the supplier of the \( \text{CO}_2 \) sampled the \( \text{CO}_2 \) stream in a quarter and measured its concentration per the sales contract terms, you may use the \( \text{CO}_2 \) concentration data from the sales contract for that quarter.

(iii) If you inject \( \text{CO}_2 \) from a production process unit that is part of your facility, you may report the quarterly \( \text{CO}_2 \) concentration of the \( \text{CO}_2 \) stream supplied that was measured following procedures provided in subpart PP of this part as the quarterly \( \text{CO}_2 \) concentration of the \( \text{CO}_2 \) stream received.

(4) You must assume that the \( \text{CO}_2 \) you receive meets the definition of a \( \text{CO}_2 \) stream unless you can trace it through written records to a source other than a \( \text{CO}_2 \) stream.

(b) Measurement devices.

(1) All flow meters must be operated continuously except as necessary for maintenance and calibration.

(2) You must calibrate all flow meters used to measure quantities reported in §98.476 according to the calibration and accuracy requirements in §98.3(1).

(3) You must operate all measurement devices according to one of the following. You may use an appropriate standard method published by a consensus-based standards organization if such a method exists or an industry standard practice. 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).

(4) You must ensure that any flow meter calibrations performed are National Institute of Standards and Technology (NIST) traceable.

(c) General.

(1) If you measure the concentration of any \( \text{CO}_2 \) quantity for reporting, you must measure according to one of the following. You may use an appropriate standard method published by a consensus-based standards organization if such a method exists or an industry standard practice.

(2) You must convert all measured volumes of \( \text{CO}_2 \) to the following standard industry temperature and pressure conditions for use in Equations UU–2 of this subpart: standard cubic meters at a temperature of 60 degrees Fahrenheit and at an absolute pressure of 1 atmosphere.

(3) For 2011, you may follow the provisions of §98.3(d)(1) through (2) for best available monitoring methods rather than follow the monitoring requirements of this section. For purposes of this subpart, any reference to
§ 98.476 Data reporting requirements.

If you are subject to this part and report under this subpart, you are not required to report the information in § 98.3(c)(4) for this subpart. In addition to the information required by § 98.3(c)(1) through § 98.3(c)(3) and by § 98.3(c)(5) through § 98.3(c)(9), you must report the information listed in this section.

(a) If you receive CO₂ by pipeline, report the following for each receiving flow meter:
   (1) The total net mass of CO₂ received (metric tons) annually.
   (2) If a volumetric flow meter is used to receive CO₂:
      (i) The volumetric flow through a receiving flow meter at standard conditions (in standard cubic meters) in each quarter.
      (ii) The volumetric flow through a receiving flow meter that is redelivered to another facility without being injected into your well (in standard cubic meters) in each quarter.
   (iii) The CO₂ concentration in the flow (volume percent CO₂ expressed as a decimal fraction) in each quarter.
   (3) If a mass flow meter is used to receive CO₂:
      (i) The mass flow through a receiving flow meter (in metric tons) in each quarter.
      (ii) The mass flow through a receiving flow meter that is redelivered to another facility without being injected into your well (in metric tons) in each quarter.
      (iii) The CO₂ concentration in the flow (weight percent CO₂ expressed as a decimal fraction) in each quarter.
   (4) The standard or method used to calculate each value in paragraphs (a)(2) through (a)(3) of this section.
   (5) The number of times in the reporting year for which substitute data procedures were used to calculate values reported in paragraphs (a)(2) through (a)(3) of this section.
   (6) Whether the flow meter is mass or volumetric.

(b) If you receive CO₂ in containers, report:
   (1) The mass (in metric tons) or volume at standard conditions (in standard cubic meters) of contents in containers in each quarter.
   (2) The concentration of CO₂ of contents in containers (volume or weight percent CO₂ expressed as a decimal fraction) in each quarter.
   (3) The mass (in metric tons) or volume (in standard cubic meters) of contents in containers that is redelivered...