Electronic Greenhouse Gas Reporting Tool

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Reporting GHG Data for Subpart RR—Geologic Sequestration of Carbon Dioxide

U.S. Environmental Protection Agency

Greenhouse Gas Reporting Program (GHGRP)

Overview of Webinar



- Subpart RR reporting in e-GGRT
- Review and submission of the Subpart RR reporting form
- Help Desk

Overview of Subpart RR



e-GGRT Greenhouse Gas Data Reporting (2017)

Select Facility » Facility or Supplier Overview

FACILITY OR SUPPLIER OVERVIEW

This page allows you to add the source and/or supplier categories for which your facility or supplier will be reporting, then to access those data reporting screens using the OPEN buttons.

After data reporting is complete, you can initiate the annual report review and submission process from this page by using the SUBMIT button (or RESUBMIT for subsequent submissions if needed).

Facility's GHG Reporting Method: Data entry via e-GGRT web-forms (Change)



1) GHG DATA REPORTING

Select appropriate subparts and complete data entry. Data Entry Validation Messages will ensure you have provided all required data and avoided common data entry mistakes.

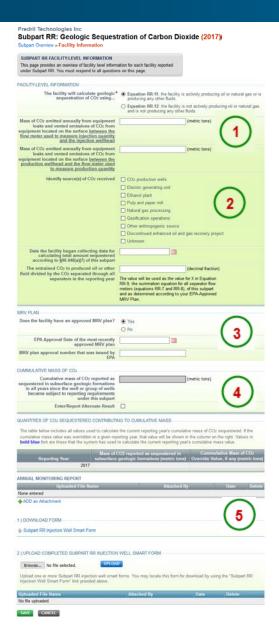
2017 Reporting Source or Supplier Category	Validation Messages?	Subpart Reporting
Subpart A—General Information	None	OPEN
Subpart RR—Geologic Sequestration of Carbon Dioxide	Cannot Submit-View Critical Errors	OPEN

ADD or REMOVE Subparts

If you are a RR reporter, please add RR to your list of required subparts.

Subpart RR Facility Level Information





- Initially when you open
 Subpart RR for the first time
 you will be presented with
 the Facility Level
 Information Screen.
- It consists of 5 parts:
 - Use of Eq. RR-11 or RR-12
 - CO2 source identification
 - MRV plan
 - Cumulative Mass of CO2
 Sequestered
 - Annual Monitoring Report and Injection Well Attachments

Eq. RR-11 or RR-12 Selection



FACILITY-LEVEL INFORMATION ————————————————————————————————————			
The facility will calculate geologic* sequestration of CO2 using	Equation RR-11: the facility is actively producing oil or natural gas or is producing any other fluids		
	Equation RR-12: the facility is not actively producing oil or natural gas and is not producing any other fluids		
Mass of CO ₂ emitted annually from equipment leaks and vented emissions of CO ₂ from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead	(metric tons)		
	or		
FACILITY-LEVEL INFORMATION —			
FACILITY-LEVEL INFORMATION The facility will calculate geologic* sequestration of CO2 using	 Equation RR-11: the facility is actively producing oil or natural gas or is producing any other fluids 		
The facility will calculate geologic*			
The facility will calculate geologic* sequestration of CO2 using Mass of CO2 emitted annually from equipment	producing any other fluids © Equation RR-12: the facility is not actively producing oil or natural gas		
The facility will calculate geologic* sequestration of CO2 using	producing any other fluids Equation RR-12: the facility is not actively producing oil or natural gas and is not producing any other fluids		
The facility will calculate geologic* sequestration of CO2 using Mass of CO2 emitted annually from equipment leaks and vented emissions of CO2 from	producing any other fluids Equation RR-12: the facility is not actively producing oil or natural gas and is not producing any other fluids		
The facility will calculate geologic* sequestration of CO2 using Mass of CO2 emitted annually from equipment leaks and vented emissions of CO2 from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead Mass of CO2 emitted annually from equipment	producing any other fluids Equation RR-12: the facility is not actively producing oil or natural gas and is not producing any other fluids		
The facility will calculate geologic* sequestration of CO2 using Mass of CO2 emitted annually from equipment leaks and vented emissions of CO2 from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead	producing any other fluids Equation RR-12: the facility is not actively producing oil or natural gas and is not producing any other fluids (metric tons)		

CO2 Source Selection



Identify source(s) of CO2 received	CO2 production wells
	Electric generating unit
	Ethanol plant
	Pulp and paper mill
	Natural gas processing
	Gasification operations
	Other anthropogenic source
	Discontinued enhanced oil and gas recovery project
	Unknown
Date the facility began collecting data for	
calculating total amount sequestered according to §98.448(a)(7) of this subpart	
The entrained CO ₂ in produced oil or other	(decimal fraction)
fluid divided by the CO2 separated through all separators in the reporting year	The value will be used as the value for X in Equation RR-9, the summation equation for all separator flow meters (equations RR-7 and RR-8), of this subpart and as determined according to your EPA-Approved MRV Plan.

MRV Plan



MRV PLAN		
Does the facility have an approved MRV plan?	Yes	
	⊚ No	
EPA Approval Date of the most recently approved MRV plan		
MRV plan approval number that was issued by EPA		

Cumulative Mass of CO2 Sequestered



CUMMULATIVE MASS OF CO2 Cumulative mass of CO2 reported as sequestered in subsurface geologic formations in all years since the well or group of wells became subject to reporting requirements under this subpart	542309.2 (metric tons)
Enter/Report Alternate Result	

QUANTITIES OF CO2 SEQUESTERED CONTRIBUTING TO CUMULATIVE MASS

The table below includes all values used to calculate the current reporting year's cumulative mass of CO2 sequestered. If the cumulative mass value was overridden in a given reporting year, that value will be shown in the column on the right. Values in **bold blue** font are those that the system has used to calculate the current reporting year's cumulative mass value.

2016	263410.3
2017	278898.9

Annual Monitoring Report and Injection Well Identification



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

Subpart Overview » Attach Monitoring Report

ANNUAL MONITORING REPORT

In addition to entering data in this reporting form, you are also required to submit an annual monitoring report that, at a minimum, contains the items on this page.

Use the upload link at the bottom of this page to attach the annual monitoring report.

ANNUAL MONITORING REPORT

Your Annual Monitoring Report should include:

- (i) A narrative history of the monitoring efforts conducted over the previous calendar year, including a listing of all monitoring equipment that was operated, its period of operation, and any relevant tests or surveys that were conducted.
- (ii) A description of any changes to the monitoring program that you concluded were not material changes warranting submission of a revised MRV plan under §98.448(d).
- (iii) A narrative history of any monitoring anomalies that were detected in the previous calendar year and how they were investigated and resolved.
- (iv) A description of any surface leakages of CO2, including a discussion of all methodologies and technologies involved in detecting and quantifying the surface leakages and any assumptions and uncertainties involved in calculating the amount of CO2 emitted.

Select file to upload

Choose File No file chosen





Annual Monitoring Report and Injection Well Identification (continued)





- Download the Subpart RR Injection Well Smart Form. For each well provide:
 - Well Identification No.
 - Underground Injection Control Permit Class

Annual Monitoring Report and Injection Well Identification (continued)



Subpart RR - Geologic Sequestration of Carbon Dioxide

1. Facility and Injection Well Identification

vvorksneet instructions:					
This worksheet provides a form for Subpart RR reporters to record the Injection Well Numbers and their respective UI Control Permit Classes. Once this form is comple uploaded to e-GGRT using the injection well list upload feature on the Facility Level Information page.					
Version:					
R.01					
External Links:	External Links:				
Subpart RR Resources Page:	https://www.epa.gov/qhgreporting/subpart-rr-geologic-sequestration-carbon-dioxide				
Subpart RR Help Page: https://www.ccdsupport.com/confluence/display/help/Subpart+RR+-+Geologic+Sequestration+of+Carbon+Dioxi					
Reporting Form Help Content:	http://www.ccdsupport.com/confluence/display/help/Reporting+Form+Instructions				

1a.) Fill out the following table with general information about this facility

A1	A2
Facility Name:	
GHGRP ID:	
Reporting Period:	
Comments: (optional)	

1b.) Fill out the following table listing all Injection Wells associated with the facility

	B1	B2
	Well Identification Number [§98.446(13.i]	Underground Injection Control Permit Class [§98.446(13.ii)]
1		
2		
3		
4		
- 1		

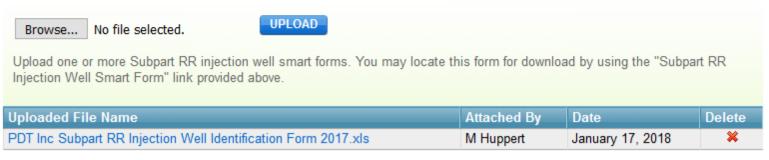
Annual Monitoring Report and Injection Well Identification (continued)



ANNUAL MONITORING REPORT

Uploaded File Name	Attached By	Date	Delete
☑PDT Inc Annual Monitoring Plan RY17.docx	M Huppert	January 24, 2018 1:44 PM	×
♣ ADD an Attachment			
1.) DOWNLOAD FORM			
1.) DOWNLOAD FORM ————————————————————————————————————			

2.) UPLOAD COMPLETED SUBPART RR INJECTION WELL SMART FORM



SAVE

CANCEL

RR Overview – after Facility Info entered (Eq RR- 12)



FACILITY INFORMATION

Calculation Method	Most Recently Approved MRV Plan	Sources of CO ₂ Received	
Equation RR-12	34462	CO2 production wells, Natural gas processing	OPEN

FLOW METERS AND CONTAINERS

Unit Name/Identifier	Туре	Measurement Basis	Annual CO2 Received (metric tons)	Status ¹	Delete
None entered					

ADD a Flow Meter or Container

INJECTION FLOW METERS

Unit Name/Identifier	Measurement Basis	Annual CO2 Injected (metric tons)	Status ¹	Delete
None entered				

ADD an Injection Flow Meter

LEAKAGE PATHWAYS

Unit Name/Identifier	Annual CO2 Emitted (metric tons)	Status ¹	Delete
None entered			

ADD a Leakage Pathway

◆ Facility Overview

RR Overview – after Facility Info entered (Eq RR- 11)



FACILITY INFORMATION

Calculation Method	Most Recently Approved MRV Plan	Sources of CO ₂ Received	
Equation RR-11	34462	CO2 production wells, Natural gas processing	OPEN

FLOW METERS AND CONTAINERS

Unit Name/Identifier	Туре	Measurement Basis	Annual CO2 Received (metric tons)	Status ¹	Delete
None entered					
ADD - Flow Motor or Con					

ADD a Flow Meter or Container

INJECTION FLOW METERS

Unit Name/Identifier	Measurement Basis	Annual CO ₂ Injected (metric tons)	Status ¹	Delete
None entered				

ADD an Injection Flow Meter

SEPARATOR FLOW METERS

Unit Name/Identifier	Measurement Basis	Annual CO2 Produced (metric tons)	Status ¹	Dele	е
None entered					

ADD a Separator Flow Meter

LEAKAGE PATHWAYS

Unit Name/Identifier	Annual CO ₂ Emitted (metric tons)	Status ¹	Delete
None entered			
_			

ADD a Leakage Pathway



Receiving Flow Meters and Containers



Start entering data to support mass received and redelivered (Eq. RR-1 and Eq. RR-2) by adding Flow Meters and Containers on the RR Overview Page:

Unit Name/Identifier Type Measurement Basis Annual CO2 Received (metric tons) Status¹ Delete None entered ADD a Flow Meter or Container

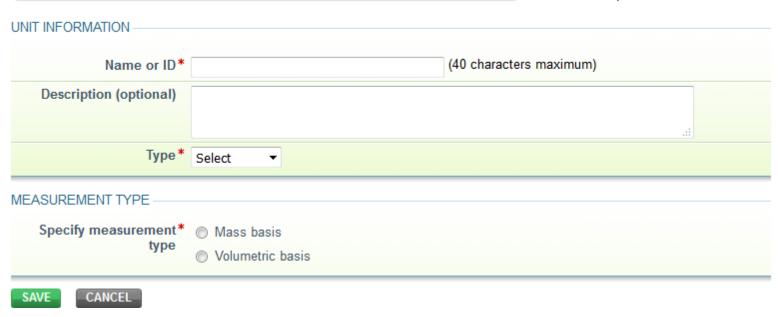
Add a Receiving Flow Meter or Container



FLOW METER OR CONTAINER

Use this page to uniquely identify each receiving flow meter or container. For additional information about adding and editing subpart RR flow meters, containers, or leakage pathways, please use the e-GGRT Help link(s) provided.

denotes a required field



Add a Receiving Flow Meter or Container (continued)



If you select Flow Meter:

CO2 INJECTION

Is CO₂ received at the*
facility mixed with other
supplies of CO₂ or are the
procedures in 98.444(a)(4)
followed?

- CO₂ is wholly injected and not mixed with any other supply of CO₂ and the procedures in 98.444(a)(4) are followed.
- CO₂ is not wholly injected or is mixed with other supplies of CO₂ or the procedures 98.444(a)(4) are not followed.

• If you selected "CO₂ is wholly injected and not mixed with any other supply of CO₂ and the procedures in 98.444(a)(4) are followed", you will not be required to enter quarterly data to support Eq. RR-1 or Eq. RR-2

Add a Receiving Flow Meter or Container (continued)



 If you selected "CO₂ is not wholly injected or is mixed with other supplies of CO₂ or the procedures of 98.444(a)(4) are not followed.", you must click Open to enter data supporting Eq. RR-1 or Eq. RR-2

FLOW METERS AND CONTAINERS

Unit Name/Identifier	Туре	Measurement Basis	Annual CO2 Received (metric tons)	Status ¹		Delete
Flow Meter 1	Flow Meter	Volumetric		Incomplete	OPEN	×

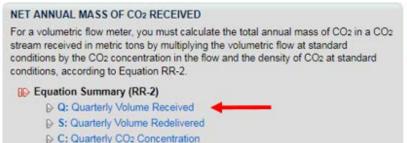
ADD a Flow Meter or Container

Enter Eq RR-1 or Eq RR-2 Data (Flow Meters)



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

Subpart Overview » Flow Meter 00 » Eq. RR-2





EQUATION RR-2 SUMMARY AND RESULT

4		
$CO_{2T,r} = \sum_{p=1}^{\infty}$	Q _{r,p} - S _{r,p}	× D × C _{CO_{2p,r}}

Quarter	Q (standard cubic meters)	S (standard cubic meters)	C (vol. %CO ₂)	D (metric tons per scm)	Resul
1				0.0018682	
2				0.0018682	
3				0.0018682	
4				0.0018682	
Report wh	nich CO2 result? Use the c	alculated result rounded		Incomplete — View \	/alidation
		own result (value will be rounde	ed)		

Enter the data supporting Eq. RR-1 or Eq. RR-2 by clicking Quarterly Volume received or Next at the bottom of the screen

This example uses Eq. RR-2

Quarterly Volume Received



QUARTERLY VOLUME REC Please provide the volumetric For additional information ab e-GGRT Help link(s) provided	c flow through the receiving out entering volumetric flow	
 Equation Summary (F □ Q: Quarterly Volur □ S: Quarterly Volur □ C: Quarterly CO2 	ne Received ne Redelivered	
VOLUMETRIC FLOW (QUART	TER 1, JANUARY TO MAR	CH)
Volumetric flow through the receiving flow meter in the quarter		(standard cubic mete
Standard or method used to calculate the volumetric flow through the receiving flow meter in the quarter	Select ▼	
Number of days for which substitute data procedures were used to calculate the volumetric flow through the receiving flow meter in the quarter		(days)
ABACK NEXT →		

For each quarter you must enter volume received, method use to calculate the flow number, and the number of days substitute data were used.

Quarterly Volume Redelivered



Please provide the volumetric to another facility without bei	EIVED THAT IS REDELIVERED of flow through the receiving flow met ng injected into your well for each q lumetric flow data, please use the e	uarter. For additional		
 ▶ Equation Summary (F ▶ Q: Quarterly Volunt ▶ S: Quarterly Volunt ▶ C: Quarterly CO2 	ne Received ne Redelivered			
VOLUMETRIC FLOW REDELI	VERED (QUARTER 1, JANUARY T	O MARCH)		
Volumetric flow through the receiving flow meter that is redelivered to another facility without being injected into your well in the quarter		(standard cubic meters)		
Standard or method used to calculate the volumetric flow through the receiving flow meter that is redelivered to another facility without being injected into your well in the quarter	Select ▼			
Number of days for which substitute data procedures were used to calculate the volumetric flow through the receiving flow meter that is redelivered to another facility without being injected into your well in the quarter		(days)	←BACK	NEXT+

For each quarter you must enter volume redelivered, method use to calculate the redelivery number, and the number of days substitute data were used.

Quarterly CO2 Concentration



volumetric flow for each quar	ation of carbon dioxide (CO2) in the flow meter's ter. For additional information about entering use the e-GGRT Help link(s) provided.
 Equation Summary (F Q: Quarterly Volur S: Quarterly Volur C: Quarterly CO2 	me Received me Redelivered
VOLUMETRIC CO2 CONCENT	TRATION (QUARTER 1, JANUARY TO MARCH)
CO ₂ concentration in the quarter	(volume %CO₂ as a decimal fraction; 0 ≤ x ≤ 1.0)
Standard or method used to calculate CO ₂ concentration in the quarter	Select ▼
Were substitute data procedures used to calculate the CO2 concentration in the quarter?	○ Yes○ No
4 DACK SHIMMADYA	

For each quarter you must enter CO2 concentration, method use to calculate the concentration number, and the number of days substitute data were used.

Completed Eq RR-1 or Eq RR-2 Data (Flow Meters)



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

Subpart Overview » Flow Meter Flow 1 » Eq. RR-2

NET ANNUAL MASS OF CO2 RECEIVED

For a volumetric flow meter, you must calculate the total annual mass of CO₂ in a CO₂ stream received in metric tons by multiplying the volumetric flow at standard conditions by the CO₂ concentration in the flow and the density of CO₂ at standard conditions, according to Equation RR-2.

1,416,219.3 (Eq. RR-2) Net annual mass of CO2 received (metric tons)

II Equation Summary (RR-2)

Q: Quarterly Volume Received

S: Quarterly Volume Redelivered

C: Quarterly CO2 Concentration

EQUATION RR-2 SUMMARY AND RESULT

$$CO_{2T,r} = \sum_{p=1}^{4} (Q_{r,p} - S_{r,p}) \times D \times C_{CO_{2p,r}}$$

Hover over an element in the equation above to reveal a definition of that element.

Quarter	Q (standard cubic meters)	S (standard cubic meters)	C (vol. %CO2)	D (metric tons per scm)	Result
1	190,805,903	35,000	0.98	0.0018682	349,681.539
2	194,003,450	34,000	0.98	0.0018682	355,544.4501
3	196,972,502	35,000	0.98	0.0018682	360,984.8657
4	190,981,275	32,000	0.98	0.0018682	350,008.4935
					1,416,219.3483

Report which CO₂ result?

- Use the calculated result rounded (1,416,219.3 metric tons)
- O Enter my own result (value will be rounded)

Enter Eq RR-1 or Eq RR-2 Data (Containers)



If you receive CO2 in containers then provide data supporting receipts and redeliveries of CO2 in containers, and provide the mass or volume of CO2 received, redelivered and its concentration."

Data entry for containers follow a similar logic to flow meters.

After entering all your data for receiving flow meters and containers your RR Overview will look something like:

FLOW METERS AND CONTAINERS

Unit Name/Identifier	Туре	Measurement Basis	Annual CO2 Received (metric tons)	Status ¹		Delete
Containers	Container	Mass	82,859.0	Complete	OPEN	×
Flow 1	Flow Meter	Volumetric	1,416,219.3	Complete	OPEN	*

ADD a Flow Meter or Container

Injection Flow Meters



Start entering data to support mass injected (Eq. RR - 4 and Eq. RR - 5) by adding Injection Flow Meters on the RR Overview Page:

INJECTION FLOW METERS



Injection Flow Meters (continued)



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

Subpart Overview » Injection Flow Meter 1 » Edit Injection Flow Meter

INJECTION FLOW METER

Use this page to uniquely identify each injection flow meter. For additional information about adding and editing subpart RR injection flow meters, please use the e-GGRT Help link(s) provided.

* denotes a required field

		denotes a required lield	
UNIT INFORMATION —			
Name or ID*	Injection Flow Meter 1	(40 characters maximum)	
Description (optional)		.ii	
Туре	Injection Flow Meter		
MEASUREMENT TYPE			
Specify measurement*	Mass basis		
type	O Volumetric basis		
FLOW METER LOCATION —			
Flow meter location*	Located immediately upstream of injection well receiving custody flow meter and the outlet of the		

Injection Flow Meters (continued)



Click "Open" next to the Injection Flow Meter to begin entering the data to support Eq. RR-4 and Eq. RR-5

ADD an Injection Flow Meter

Injection Flow Meters (continued)



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

Subpart Overview » Injection Flow Meter Injection Flow Meter 1 » Eq. RR-4

NET ANNUAL MASS OF CO2 INJECTED

For a mass injection flow meter, you must calculate the total annual mass of CO₂ injected in metric tons by multiplying the mass flow by the CO₂ concentration in the flow, according to Equation RR-4.

(RR-4)

- Q: Quarterly Mass Flow Rate
- C: Quarterly CO2 Concentration

(Eq. RR-4) Annual mass of CO2 injected (metric tons)

EQUATION RR-4 SUMMARY AND RESULT

CO_{2,u}= $\sum_{p=1}^{4} Q_{p,u} \times C_{CO_{2p,u}}$

Hover over an element in the equation above to reveal a definition of that element.

Quarter	Q (metric tons)	C (wt. %CO ₂)	Result
1			
2			
3			
4			
		Incomplete —	View Validation

Report which CO2 result?

- Use the calculated result rounded
- Enter my own result (value will be rounded)

FINISHED

CANCEL

NEXT+

Enter the data supporting Eq. RR-4 or Eq RR-5 by clicking Quarterly Mass Flow Rate or Next at the bottom of the screen

This example uses Eq. RR-4

Injection Flow Meters: Quarterly Flow Rates



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017) Subpart Overview » Injection Flow Meter Injection Flow Meter 1 » Eq. RR-4 QUARTERLY MASS FLOW Please provide the mass flow through the injection flow meter for each quarter. For additional information about entering mass flow rate data, please use the e-GGRT Help link(s) provided. Equation Summary (RR-4) Q: Quarterly Mass Flow Rate C: Quarterly CO2 Concentration MASS FLOW (QUARTER 1, JANUARY TO MARCH) Mass flow through the (metric tons) injection flow meter in the quarter Standard or method used Select • to calculate the mass flow through the injection flow meter in the quarter Number of days for which (days) substitute data procedures were used to calculate the mass flow through the injection flow meter in the ◆BACK

For each quarter you must enter mass flow through the injection flow meter, method used to calculate the flow number, and the number of days substitute data were used.

Injection Flow Meters: Quarterly CO2 Concentrations



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

Subpart Overview » Injection Flow Meter Injection Flow Meter 1 » Eq. RR-4

mass flow for each quarter. F	XIDE CONCENTRATION ation of carbon dioxide (CO ₂) in the injection flow meter's For additional information about entering CO ₂ use the e-GGRT Help link(s) provided.	
▶ Equation Summary (I	RR-4)	
Q: Quarterly Mass	s Flow Rate	
C: Quarterly CO2	Concentration	
MASS CO2 CONCENTRATION	N (QUARTER 1, JANUARY TO MARCH)	
CO ₂ concentration in the		decimal fraction; 0 ≤ x ≤ 1.0)
quarter	(weight 70002 as a	decimal nuclion, v = x = 1.0)
Standard or method used to calculate CO2 concentration in the	ASTM E1747-95 (2005) ×	
quarter		
Were substitute data procedures used to calculate the CO2	○ Yes	
concentration in the quarter?	● No	
←BACK SUM	IMARY→	

For each quarter you must also enter the concentration of CO2 monitored during the quarter, method used to calculate the concentration number, and the number of days of substitute data were used.

Injection Flow Meters: Meter Summary

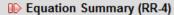


Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

Subpart Overview » Injection Flow Meter Injection Flow Meter 1 » Eq. RR-4

NET ANNUAL MASS OF CO2 INJECTED

For a mass injection flow meter, you must calculate the total annual mass of CO2 injected in metric tons by multiplying the mass flow by the CO2 concentration in the flow, according to Equation RR-4.



Q: Quarterly Mass Flow Rate

C: Quarterly CO2 Concentration

...

1.731.233.7

(Eq. RR-4) Annual mass of CO2 injected (metric tons)

EQUATION RR-4 SUMMARY AND RESULT

$$CO_{2,u} = \sum_{p=1}^{4} Q_{p,u} \times C_{CO_{2p,u}}$$

Hover over an element in the equation above to reveal a definition of that element.

Quarter	Q (metric tons)	C (wt. %CO ₂)	Result
1	425,344	0.98	416,837.12
2	424,667	0.98	416,173.66
3	469,987	0.98	460,587.26
4	446,567	0.98	437,635.66
			1,731,233.7

Report which CO₂ result?

- Use the calculated result rounded (1,731,233.7 metric tons)
- Enter my own result (value will be rounded)







Subpart RR Overview – after enter injection flow meter data



FACILITY INFORMATION

Calculation Method	Most Recently Approved MRV Plan	Sources of CO ₂ Received	
Equation RR-11	34344	CO2 production wells, Natural gas processing	OPEN

FLOW METERS AND CONTAINERS

Unit Name/Identifier	Туре	Measurement Basis	Annual CO2 Received (metric tons)	Status ¹		Delete
Containers	Container	Mass	82,859.0	Complete	OPEN	×
Flow 1	Flow Meter	Volumetric	1,416,219.3	Complete	OPEN	*

ADD a Flow Meter or Container

INJECTION FLOW METERS

Unit Name/Identifier	Measurement Basis	Annual CO2 Injected (metric tons)	Status ¹		Delete
Injection Flow Meter 1	Mass		Incomplete	OPEN	×

ADD an Injection Flow Meter

Separator Flow Meters



If you are using Eq. RR-11 (as selected in the facility information section) you must provide data for each separator that sends a stream of gas into a recycle or end use system in accordance with the procedures specified in paragraphs 98.443 (d)(1) through (d)(3).

Initiate entry of separator flow meter data by adding a separator flow meter on the RR Overview Page:

Unit Name/Identifier Measurement Basis Annual CO2 Produced (metric tons) Status¹ Delete None entered ADD a Separator Flow Meter

Separator Flow Meters (continued)



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

Subpart Overview » Separator Meter 1 » Edit Separator Flow Meter

SEPARATOR FLOW METER

Use this page to uniquely identify each separator flow meter. For additional information about adding and editing subpart RR separator flow meters, please use the e-GGRT Help link(s) provided.

*denotes a required field

UNIT INFORMATION ————			
Name or ID*	Separator Meter 1	(40 characters maximum)	
Description (optional)			
Туре	Separator Flow Meter		
MEASUREMENT TYPE			
Specify measurement type*	Mass basis Volumetric basis		
SAVE CANCEL			

Separator Flow Meters (continued)



Click Open next to the Separator Flow Meter to begin entering the data to support Eq. RR-7 and Eq. RR-8

SEPARATOR FLOW METERS

Unit Name/Identifier	Measurement Basis	Annual CO2 Produced (metric tons)	Status ¹		Delete
Separator Meter 1	Volumetric		Incomplete	OPEN	×
B ADD - OI El M				_	

ADD a Separator Flow Meter

Separator Flow Meters (continued)

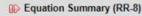




Subpart Overview » Separator Flow Meter Separator Meter 1 » Eq. RR-8

NET ANNUAL MASS OF CO2 PRODUCED

For a volumetric separator flow meter, you must calculate the total annual mass of CO2 produced in metric tons by multiplying the volumetric flow at standard conditions by the CO2 concentration in the flow and the density of CO2 at standard conditions. according to Equation RR-8.



Q: Quarterly Volumetric Flow Rate

C: Quarterly CO2 Concentration

EQUATION RR-8 SUMMARY AND RESULT

 $CO_{2,u} = \sum_{Q_{p,W} \times D} \times C_{CO_{2p,w}}$

Hover over an element in the equation above to reveal a definition of that element.

Quarter	Q (standard cubic meters)	C (vol. %CO ₂)	D (metric tons per scm)	Result
1			0.0018682	
2			0.0018682	
3			0.0018682	
4			0.0018682	
			Incomplete — View	Validation

Report which CO2 result? Use the calculated result rounded

Enter my own result (value will be rounded)

FACTOR IN SUMMATION EQUATION SHARED BY ALL SEPARATORS

The entrained CO2 in produced oil or other fluid divided by the CO2 separated through all separators in the reporting year

The value will be used as the value for X in Equation RR-9, the summation equation for all separator flow meters (equations RR-7 and RR-8), of this subpart and as determined according to your EPA-Approved MRV Plan.

0.005 (decimal fraction)

(Eq. RR-8) Annual mass of CO2 produced

(metric tons)

Enter the data supporting Eq. RR-7 or Eq. RR-8 by clicking Quarterly Mass (or Volume) Flow Rate or Next at the bottom of the screen

This example uses Eq. RR-8



Separator Flow Meters: Quarterly Flow Rates



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017) Subpart Overview » Separator Flow Meter Separator Meter 1 » Eq. RR-8 QUARTERLY VOLUMETRIC FLOW Please provide the volumetric flow through the separator flow meter for each quarter. For additional information about entering volumetric flow rate data, please use the e-GGRT Help link(s) provided. Q: Quarterly Volumetric Flow Rate C: Quarterly CO2 Concentration VOLUMETRIC FLOW (QUARTER 1, JANUARY TO MARCH) Volumetric flow through (standard cubic meters) the separator flow meter in the quarter Standard or method used Select • to calculate the volumetric flow through the separator flow meter in the quarter Number of days for which (days) substitute data procedures were used to calculate the volumetric flow through the separator flow meter in the quarter

←BACK

NEXT→

For each quarter you must enter mass or volumetric flow through the separator flow meter, method used to calculate the flow number, and the number of days substitute data were used.

Separator Flow Meters: Quarterly CO2 Concentrations

Subpart Overview » Separator Flow Meter Separator Meter 1 » Eq. RR-8



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

QUARTERLY CARBON DIOXIDE CONCENTRATION Please provide the concentration of carbon dioxide (CO₂) in the separator flow meter's volumetric flow for each quarter. For additional information about entering CO2 concentration data, please use the e-GGRT Help link(s) provided. Q: Quarterly Volumetric Flow Rate DE C: Quarterly CO2 Concentration VOLUMETRIC CO2 CONCENTRATION (QUARTER 1, JANUARY TO MARCH) CO₂ concentration in the (volume %CO₂ as a decimal fraction; $0 \le x \le 1.0$) Standard or method used Select to calculate CO2 concentration in the quarter Were substitute data Yes procedures used to calculate the CO2 No concentration in the quarter? **+BACK SUMMARY**→

For each quarter you must also enter the concentration of CO2 monitored during the quarter, method used to calculate the concentration number, and the number of days substitute data were used.

Separator Flow Meters: after entering Eq. RR-8 data



Subpart Overview » Separator Flow Meter Separator Flow Meter 1 » Eq. RR-7

NET ANNUAL MASS OF CO2 PRODUCED

For a mass separator flow meter, you must calculate the total annual mass of CO2 produced in metric tons by multiplying the mass flow by the CO2 concentration in the flow, according to Equation RR-7.

II Equation Summary (RR-7)

Q: Quarterly Mass Flow Rate

C: Quarterly CO2 Concentration

945,678.4
(Eq. RR-7) Annual mass of CO2 produced

EQUATION RR-7 SUMMARY AND RESULT

$$CO_{2,u} = \sum_{p=1}^{4} Q_{p,W} \times C_{CO_{2p,w}}$$

Hover over an element in the equation above to reveal a definition of that element.

Quarter	Q (metric tons)	C (wt. %CO ₂)	Result
1	243,455	0.98	238,585.9
2	234,535	0.98	229,844.3
3	243,535	0.98	238,664.3
4	243,453	0.98	238,583.94
			945,678.44

Report which CO₂ result?

- Use the calculated result rounded (945,678.4 metric tons)
- Enter my own result (value will be rounded)

FACTOR IN SUMMATION EQUATION SHARED BY ALL SEPARATORS

The entrained CO₂ in produced oil or other fluid divided by the CO₂ separated through all separators in the reporting year 0.005 (decimal fraction)

The value will be used as the value for X in Equation RR-9, the summation equation for all separator flow meters (equations RR-7 and RR-8), of this subpart and as determined according to your EPA-Approved MRV Plan.







RR Overview: after entering Separator Flow Meters



FACILITY INFORMATION

Calculation Method	Most Recently Approved MRV Plan	Sources of CO ₂ Received	
Equation RR-11	34344	CO2 production wells, Natural gas processing	OPEN

FLOW METERS AND CONTAINERS

Unit Name/Identifier	Туре	Measurement Basis	Annual CO2 Received (metric tons)	Status ¹		Delete
Containers	Container	Mass	82,859.0	Complete	OPEN	×
Flow 1	Flow Meter	Volumetric	1,416,219.3	Complete	OPEN	×

ADD a Flow Meter or Container

INJECTION FLOW METERS

Unit Name/Identifier	Measurement Basis	Annual CO2 Injected (metric tons)	Status ¹		Delete
Injection Flow Meter 1	Mass	1,731,233.7	Complete	OPEN	×

ADD an Injection Flow Meter

SEPARATOR FLOW METERS

Unit Name/Identifier	Measurement Basis	Annual CO2 Produced (metric tons)	Status ¹		Delete
Separator Flow Meter 1	Mass	945,678.4	Complete	OPEN	×

ADD a Separator Flow Meter

Leakage Pathways



Start entering data to support mass escaping by leakage (Eq. RR-10) by adding leakage pathways on the RR Overview Page:

LEAKAGE PATHWAYS

Unit Name/Ident	ifier	Annual CO2 Emitted (metric tons)	Status ¹	Delete		
None entered						
ADD a Leakage Pathway	-					

Leakage Pathways (continued)



Enter the Leakage Pathway data to support Eq. RR-10

LEAKAGE PATHWAY Use this page to uniquely identify each leakage pathway through which CO2 emissions occurred during the reporting year. For additional information about adding and editing subpart RR leakage pathways, please use the e-GGRT Help link(s) provided. denotes a required field LEAKAGE PATHWAY INFORMATION (40 characters maximum) Name or ID* Leakage Pathway 0101002 Description (optional) Description of leakage pathway(s) and release scenario(s) Leakage Pathway CO2 MASS EMISSIONS Mass of CO₂ emitted 8719 (metric tons) through the pathway in the reporting year **SAVE** CANCEL

RR Overview: completed



FACILITY INFORMATION

Calculation Method	Most Recently Approved MRV Plan	Sources of CO ₂ Received	
Equation RR-11	34344	CO2 production wells, Natural gas processing	OPEN

FLOW METERS AND CONTAINERS

	Unit Name/Identifier	Туре	Measurement Basis	Annual CO2 Received (metric tons)	Status ¹		Delete
L.	Containers	Container	Mass	82,859.0	Complete	OPEN	×
	Flow 1	Flow Meter	Volumetric	1,416,219.3	Complete	OPEN	*

ADD a Flow Meter or Container

INJECTION FLOW METERS

Unit Name/Identifier	Measurement Basis	Annual CO2 Injected (metric tons)	Status ¹		Delete
Injection Flow Meter 1	Mass	1,731,233.7	Incomplete	OPEN	×

ADD an Injection Flow Meter

SEPARATOR FLOW METERS

Unit Name/Identifier	Measurement Basis	Annual CO2 Produced (metric tons)	Status ¹		Delete
Separator Flow Meter 1	Mass	945,678.4	Complete	OPEN	×

ADD a Separator Flow Meter

LEAKAGE PATHWAYS

Unit Name/Identifier	Annual CO ₂ Emitted (metric tons)	Status ¹	Delete
Leakage Pathway 0101002	8,719.0	Complete	×

ADD a Leakage Pathway



Subpart RR Validation



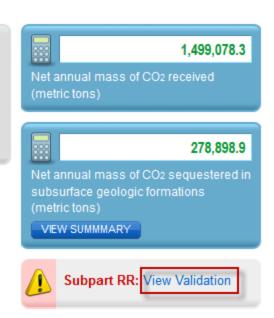
Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

Subpart Overview

OVERVIEW OF SUBPART RR REPORTING REQUIREMENTS

The Geologic Sequestration of Carbon Dioxide (CO₂) source category (Subpart RR) provides a mechanism for facilities to monitor and report amounts of CO₂ sequestered.

For additional information about Subpart RR reporting, please use the e-GGRT Help link(s) provided.



E-GGRT validation assures that each of the required data items is provided by the report and helps reporters by letting them know if data are outside the range expected by EPA.

To review your validation report Click "View Validation on the RR Overview Page:

Subpart RR Validation (continued)



Subpart RR: Geologic Sequestration of Carbon Dioxide (2017)

Subpart Overview » Validation Report

SUBPART VALIDATION REPORT

This report contains a complete set of validation messages for all data required by this Subpart. For additional information about Validation Reports, please use the e-GGRT Help link(s) provided.



FACILITY-LEVEL VALIDATION MESSAGES

Validation Type ¹	ID ²	Message ³				
No facility-level validation r	acility-level validation messages found.					

UNIT-LEVEL VALIDATION MESSAGES



The validation report notes any issue e-GGRT identifies. The validation message is "clickable" and will take the user to the page where the issue can be corrected.

Submission



e-GGRT Greenhouse Gas Data Reporting (2017)

Select Facility » Facility or Supplier Overview

FACILITY OR SUPPLIER OVERVIEW

This page allows you to add the source and/or supplier categories for which your facility or supplier will be reporting, then to access those data reporting screens using the OPEN buttons.

After data reporting is complete, you can initiate the annual report review and submission process from this page by using the SUBMIT button (or RESUBMIT for subsequent submissions if needed).

Facility's GHG Reporting Method: Data entry via e-GGRT web-forms (Change)

The Annual Report has already been prepared. Any changes you make to report data will not be reflected in that version. After making changes to report data you must choose REPORT SUBMISSION below, then click REGENERATE for those changes to be included in an updated version of the Annual Report.



Once you have addressed all of your validation issues you will see a Facility Overview like this.

REPORT DATA

2016 Reporting Source or Supplier Category	Validation Messages?	Subpart Reporting	
Subpart A—General Information	None	OPEN	
Subpart RR—Geologic Sequestration of Carbon Dioxide	None	OPEN	

ADD or REMOVE Subparts

If all subparts are completed and Validation Messages addressed to your satisfaction, you are ready to prepare and submit an Annual Report.

SUBMIT ANNUAL REPORT¹

Report	Uploaded File Name	Status	Submitted Date	Certification Date	
2016 Annual Report v1		Ready for review			REPORT SUBMISSION

Click "Report Submission" to complete your reporting.

Help Desk



GHGRP Help Desk

Email: ghgreporting@epa.gov

Web: http://www.ccdsupport.com/confluence/display/help/

As a reminder, please do not submit sensitive or business confidential information to the helpline. Anything you send to the Help Desk may be made available to the public.