

SDG&E, June 15th, 2023

Rulemaking (R.) 15-01-008 to Adopt Rules and Procedures Governing Commission Regulated Natural Gas Pipelines and Facilities to Reduce Natural Gas Leaks Consistent with Senate Bill 1371, Leno.

In Response to Data Request, R15-01-008 2023 June Report

Appendix 5; Rev. 03/30/2023

Notes:

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

As revised in 2022, add F1, F2 and F3 for Farm Taps

Distribution M&R Station Leaks and Emissions (Informational Purposes Only)

Number of Stations	Station Classification	Emission Factor (Mscf/yr)	Annual Emissions (Mscf)	Explanatory Notes / Comments
2	A1	40.6	81.2	2021 EOY Above Grade < 100 psi Actual Inlet Press
12	A2	896.5	10758.0	2021 EOY Above Grade 100 - 300 psi Actual Inlet Press
33	A3	1684.5	55588.5	2021 EOY Above Grade > 300 psi Actual Inlet Press
10	B1	0.964	9.6	2021 EOY Below Grade < 100 psi Actual Inlet Press
76	B2	1.84	139.8	2021 EOY Below Grade 100 - 300 psi Actual Inlet Press
330	B3	12.176	4018.1	2021 EOY Below Grade > 300 psi Actual Inlet Press
Total			70,595	

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 Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.
 At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.
 After completing the tab on "Leak Based - Station Emissions" and "Station - Unknown Leaks" fill in the table for "Leak Based - Emissions Summary."

Distribution M&R Station Leaks:

ID	Geographic Location	M&R Station or Farm Tap Classification	Component Type	Incoming Pressure (psi)	Leak Grade	Upgraded Leak Grade or Downgraded Leak Grade	Leak Discovery Method	Discovery Date (MM/DD/YY)	Re-Grade Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Scheduled Repair Date (MM/DD/YY)	Reason for Not Scheduling a Repair	Number of Days Leaking	Number of Days to Repair	Emission Factor (Mscf/Day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
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Not Applicable

Sum Total Emissions from leaks carried over from before 2021 [REDACTED] Provided as an example.

Sum Total Emissions from leaks discovered in 2021 [REDACTED] Provided as an example.

Sum Total Emissions from O&M Leaks discovered in 2021 [REDACTED] Provided as an example.

Grand Total of all 2021 emissions from leaks [REDACTED] Provided as an example.

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Notes:
 If highlighted cells are filled in, the other cells will auto-populate

Summary of Data by Distribution M&R Station Results for Annual System Leak Rate and Resulting Number of Unknown Leaks calculated for M&R Station

M&R Station Classification; Leak Grade or Bubble Size Category if available.	Total System M&R Station per survey Cycle	M&R Station on Annual Survey [MX,A]	M&R Station on Multi-Year Survey Cycles [MXTot]	Survey Interval (yrs) [I]	M&R Station Surveyed Annually from Multi-Year Survey Cycles [MX,I]	Total # of Leaks Detected from Survey [N _{xL}]	Annual Leak Rate [Leaks / Meter] $R_x = \frac{N_{xL}}{M_{xA} + (I \times M_{xI})}$	# of Unknown Leaks $N_{x,unk} = R_x \times (M_{xI}^{tot} - M_{xI}) \times \frac{I}{2}$	Total # of Leaks Detected from O&M* [N _{xO}]
Not Applicable				1			-	-	
				3			-	-	
				5			-	-	
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 At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange

Distribution M&R Station Damage (3rd party dig-ins, natural disasters, etc.):

ID	Geographic Location	Damage Type	Pipe Material	Pipe Size (nominal)	Pipe Age (months)	Pressure (psi)	Leak Grade	Above Ground or Below Ground	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor (Mscf/Day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
Sum Total													0	

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Distribution M&R Station Blowdowns:

ID	Geographic Location	Number of Blowdown Events	Annual Emissions (Mscf)	Explanatory Notes / Comments
N/A	SDG&E Territory	2100	8.4	External District Reg. Inspection at Distribution M&R Stations - Estimated avg. gas vented = 4 scf/insp
N/A	SDG&E Territory	10	0.3	Filter Change out or Filter Inspection w/parts replacement - Estimated avg. gas vented = 30 scf/ea
N/A	SDG&E Territory	461	6.3	M&R Station Inspection Blowdown
N/A	SDG&E Territory	208	2.5	Reg. Change out & Internal Reg. Inspection at Distribution M&R Stations - Estimated avg. gas vented = 12 scf/ea
		Sum Total	17	

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Notes:

The data collected on this sheet is for informational purposes and may not be included in the emissions inventory for 2021. The worksheet is designed to track actual emissions for future reference and to determine if an actual leak based emission accounting is feasible for M&R stations.

If you record data using this table and you only leak survey part of your system, you must extrapolate emissions from leaks up to account for emissions from your entire system for the year.

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange

The emissions captured on this tab represent the emissions associated with the operational design and function of the component. Any intentional release of natural gas for safety or maintenance purposes should be included on the Blowdowns worksheet.

Distribution M&R Station Component Vented Emissions:

ID	Geographic Location	Station Classification	Device Type	Bleed Rate	Manufacturer	Number of Days Emitting	Engineering or Manufacturer's based Estimate of Emissions	Annual Emissions (Mscf)	Explanatory Notes / Comments
								Sum Total	0

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Notes:

The data collected on this sheet is for informational purposes and will not be included in the emissions inventory for 2021. The worksheet is designed to track actual leaks for future reference and to determine if an actual leak based emission accounting is feasible for M&R stations.

If you record data using this table and you only leak survey part of your system, you must extrapolate emissions from leaks up to account for emissions from your entire system for the year.

Use a formula-derived value with the formula used in the Annual Emissions column. Do not use a copy and paste-as-value.

At the end of Annual Emissions Column, add a summation total in a cell for a column total, and then highlight orange.

The emissions captured on this tab represent the emissions associated with unintentional leaks that if repaired would not leaking. If the component is releasing gas or "bleeding" as a result of its design or function then it is not to be captured in this tab.

Distribution M&R Station Component Fugitive Leaks:

ID	Geographic Location	Station Classification	Device Type	Bleed Rate	Manufacturer	Pressure (psi)	Discovery Date (MM/DD/YY)	Repair Date (MM/DD/YY)	Number of Days Leaking	Emission Factor (Mscf/day)	Annual Emissions (Mscf)	Explanatory Notes / Comments
100022595301		B3	C	N/A		Greater than 60	10/1/2022	10/1/2022	274	0.043	11.782 M&R Leak	
100022099034		B3	C	N/A		Greater than 60	7/5/2022	7/5/2022	186	0.043	7.998 M&R Leak	
100021174119	92084	B3	C	N/A		Greater than 60	1/11/2022	1/11/2022	11	0.043	0.473 M&R Leak	
100022090904	92108	B3	C	N/A		Greater than 60	6/13/2022	6/13/2022	164	0.043	7.052 M&R Leak	
10002258454		B3	C	N/A		Greater than 60	9/26/2022	9/26/2022	269	0.043	11.567 M&R Leak	
100022290286	92008	B3	C	N/A		Greater than 60	8/18/2022	8/18/2022	230	0.043	9.89 M&R Leak	
100022216889	92008	B3	C	N/A		Greater than 60	8/3/2022	8/3/2022	215	0.043	9.245 M&R Leak	
100022588052		B3	C	N/A		Greater than 60	11/28/2022	11/28/2022	332	0.043	14.276 M&R Leak	
100022245451		B3	C	N/A		Greater than 60	8/11/2022	8/11/2022	223	0.043	9.589 M&R Leak	
100022209263	92078	B3	C	N/A		Greater than 60	9/27/2022	9/27/2022	270	0.043	11.61 M&R Leak	
100022217135	92008	B3	BV	N/A	Cooper/Cameron	Greater than 60	8/3/2022	8/3/2022	215	0.014	3.01 M&R Leak	
100022083714	92118	B2	BV	N/A	Rockwell (Std.)	Greater than 60	8/19/2022	8/19/2022	231	0.014	3.234 M&R Leak	
100021438719	91910	B3	BV	N/A	Rockwell (Std.)	Greater than 60	4/26/2022	4/26/2022	116	0.014	1.624 M&R Leak	
100022206359	92078	B3	BV	N/A	Rockwell (Std.)	Greater than 60	9/27/2022	9/27/2022	270	0.014	3.78 M&R Leak	
100021438755	92024	B3	BV	N/A	Rockwell (Std.)	Greater than 60	6/14/2022	6/14/2022	165	0.014	2.31 M&R Leak	
100021170727	92084	B3	C	N/A		Greater than 60	1/10/2022	1/10/2022	10	0.043	0.43 M&R Leak	
100022661225	92024	B3	C	N/A		Greater than 60	10/18/2022	10/18/2022	291	0.043	12.513 M&R Leak	
100021170728	92084	B3	C	N/A		Greater than 60	1/10/2022	1/10/2022	10	0.043	0.43 M&R Leak	
100021172735	92136	B3	C	N/A		Greater than 60	1/10/2022	1/10/2022	10	0.043	0.43 M&R Leak	
100021863722	92116	B3	C	N/A		Greater than 60	5/9/2022	5/9/2022	129	0.043	5.547 M&R Leak	
100021493159	92154	B3	C	N/A		Greater than 60	3/10/2022	3/10/2022	69	0.043	2.967 M&R Leak	
100022720994		B3	C	N/A		Greater than 60	10/27/2022	10/27/2022	300	0.043	12.9 M&R Leak	
100022509774		B3	C	N/A		Greater than 60	9/13/2022	9/13/2022	256	0.043	11.008 M&R Leak	
100021864524	92116	B3	C	N/A		Greater than 60	5/10/2022	5/10/2022	130	0.043	5.59 M&R Leak	
100022725185		B3	R	N/A	Mooney	Greater than 60	10/27/2022	10/27/2022	300	0.02	6 M&R Leak	
100022586795	92009	B3	BV	N/A	Rockwell (Std.)	Greater than 60	11/28/2022	11/28/2022	332	0.014	4.648 M&R Leak	
100021438808	92057	B3	BV	N/A	Rockwell (Std.)	Greater than 60	4/19/2022	4/19/2022	109	0.014	1.526 M&R Leak	
100020917733	92028	B3	C	N/A		Greater than 60	1/24/2022	1/24/2022	24	0.043	1.032 M&R Leak	
Sum Total											172	

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Header column "Comment" boxes displayed below for reference.	
Column Heading	Description and Definition of Required Contents (If not self-explanatory)
Population - Station Emissions	
Number of Stations	
Station Classification	A1 = above grade, pressure <100 psi A2 = above grade, pressure =100-300 psi A3 = above grade, pressure >300 psi B1 = below grade, pressure <100 psi B2 = below grade, pressure =100-300 psi B3 = below grade, pressure >300 psi
Emission Factor (Mscf/yr)	
Annual Emissions (Mscf)	
Explanatory Notes / Comments	
Leak Based - Station Emissions	
ID	
Geographic Location	GIS, zip code, or equivalent
M&R Station or Farm Tap Classification	A1 = above grade, pressure <100 psi A2 = above grade, pressure = 100 - 300 psi A3 = above grade, pressure >300 psi B1 = below grade, pressure <100 psi B2 = below grade, pressure = 100 - 300 psi B3 = below grade, pressure > 300 psi F1 = farm tap, pressure <100 psi F2 = farm tap, pressure = 100 - 300 psi F3 = farm tap, pressure >300 psi
Component Type	C = copper CI = cast iron P = plastics (Acetyl, ABS, PE, PVC, etc.) PB = cathodically protected steel, bare PC = cathodically protected steel, coated UB = unprotected steel, bare UC = unprotected steel, coated
Incoming Pressure (psi)	
Leak Grade	
Upgraded Leak Grade or Downgraded Leak Grade	
Leak Discovery Method	
Discovery Date (MM/DD/YY)	
Re-Grade Date (MM/DD/YY)	
Repair Date (MM/DD/YY)	
Scheduled Repair Date (MM/DD/YY)	

Reason for Not Scheduling a Repair	
Number of Days Leaking	
Number of Days to Repair	
Emission Factor (Mscf/Day)	
Annual Emissions (Mscf)	
Explanatory Notes / Comments	
Leak Based - Unknown Leaks	
M&R Station Classification; Leak Grade or Bubble Size Category if available.	Utilities should add rows according to their bubble size categories and nomenclature, and should include a no-bubble category. For example, include a row for each: Foam/ Indeterminate; Bubbles; Soap Blown Off; and No Bubbles.
Total System M&R Station per survey Cycle	
M&R Station on Annual Survey [MX,A]	
M&R Station on Multi-Year Survey Cycles [MXTot]	
Survey Interval (yrs) [I]	
M&R Station Surveyed Annually from Multi-Year Survey Cycles [MX,I]	
Total # of Leaks Detected from Survey [N _{X,L}]	
Annual Leak Rate [Leaks / Meter]	$R_X = \frac{N_{X,L}}{M_{X,A} + (I \times M_{X,I})}$
# of Unknown Leaks	$N_{X,unk} = \bar{R}_X \times (M_X^{Tot} - M_{X,I}) \times \frac{I}{2}$ <p>If the operator changed the leak survey cycle during the report year that requires more detailed calculations based on the approved calculation methodology to determine the number of unknown leaks an additional worksheet may be added to show the calculations.</p>
Total # of Leaks Detected from O&M* [N _{X,O}]	
Leak Based - Emissions Summary	
Grade if Applicable	
Count of Leaks Carried over from Prior Year	Based on a leak start date prior to the first day of the year of interest.
Count of Leaks Discovered in the Year of Interest	The total number of leaks by grade or category discovered in the year of interest.
Count of Leaks Repaired in the Year of Interest	If a leak is downgraded to not leaking, do not count it.
Average Days to Repair Leaks	The average days to repair leaks should be based on the formula: (Repair Date/Time minus Discovery Date/Time) plus (one day, unless using a discrete time stamp for leak repairs), then take the sum and divide by number of leaks repaired by grade to get the average days to repair.

Count of Estimated Unsurveyed Leaks in the Year of Interest	For leaks identified in Unsurveyed areas extrapolate the proportion of leak counts by grade that were found in the respective areas based on the year or periods used to estimate the unsurveyed leak count. If the unsurveyed leak count was based on the current year leak count by grade detected then use the current proportion of graded leak count applied to the unsurveyed leaks.
Count of Remaining Leaks at final day of the Year of Interest (12/31/22)	This count is only of the actual leaks detected in the operator's system that have not been repaired as of 12/31 of the year of interest.
Emissions from Leaks Carried over from Prior Year.	Based on a leak start date prior to the first day of the year of interest. This includes leaks discovered through O&M and survey activities.
Emissions from Leaks Discovered in the Year of Interest.	The total number of leaks by grade or category discovered in the year of interest. This includes leaks discovered through O&M and survey activities.
Emissions from Estimated Unsurveyed Leaks in the Year of Interest	The emissions by grade would be on the same basis that used to extrapolate the count of leaks in the unsurveyed areas. For example: For leaks identified in Unsurveyed areas extrapolate the proportion of leak emissions by grade that were found in the respective areas based on the year or periods used to estimate the unsurveyed leak count. If the unsurveyed leak count was based on the current year leaks detected then use the current proportion of graded leaks applied to the unsurveyed leak emissions.
Total Emissions in the Year of Interest [Mscf of Natural Gas]	
All Damages	
ID	
Geographic Location	GIS, zip code, or equivalent
Damage Type	E = excavation damage N = natural force damage O = other outside force damage
Pipe Material	PB = cathodically protected steel, bare PC = cathodically protected steel, coated UB = unprotected steel, bare UC = unptotected steel, coated
Pipe Size (nominal)	
Pipe Age (months)	
Pressure (psi)	MOP = maximum operating pressure over the past year
Leak Grade	1 = grade 1 2 = grade 2 2+ = grade 2+ 3 = grade 3 N = non-graded or ungraded
Above Ground or Below Ground	AH = above ground, hazardous AN = above ground, non-hazardous B = below ground

Discovery Date (MM/DD/YY)	
Repair Date (MM/DD/YY)	
Number of Days Leaking	<p>If date and time stamp are reliable and used consistently by respondent, then emissions may be calculated based on actual time leaking. E.G. Repair time - damage event time = duration of event.</p> <p>If respondent has average or historical leak duration based on the nature and circumstances of damages, then these may be applied to like damage events. The emissions factors should be adequately supported and explained in the filing.</p> <p>If actual time stamps and historical averages are not available, then whole days should be used in the engineering calculation. The leak begins with the damage event date thru repair date or December 31st of subject year, whichever is later. E.G. Days Leaking = Repair date - date of damage + 1 day.</p>
Emission Factor (Mscf/Day)	
Annual Emissions (Mscf)	
Explanatory Notes / Comments	Provide method of calculation and example of formula. Explain how any EF's used were derived.
Blowdowns	
ID	
Geographic Location	GIS, zip code, or equivalent
Number of Blowdown Events	
Annual Emissions (Mscf)	
Explanatory Notes / Comments	
Component Vented Emissions	
ID	
Geographic Location	GIS, zip code, or equivalent
Station Classification	A1 = above grade, pressure <100 psi A2 = above grade, pressure =100-300 psi A3 = above grade, pressure >300 psi B1 = below grade, pressure <100 psi B2 = below grade, pressure =100-300 psi B3 = below grade, pressure >300 psi
DeviceType	C = connector OE = open-ended line M = meter P = pneumatic device PR = pressure relief valve V = valve O = other devices
Bleed Rate	L = low bleed I = intermittent bleed H = high bleed NA = not applicable
Manufacturer	
NumberofDays Emitting	Because the emissions are a factor of design or function, these emissions counted for the entire year.

Engineering or Manufacturer's based Estimate of Emissions	
Annual Emissions(Mscf)	The emissions should be based on 365 days times the actual volume emitting if known, or the approved Emissions Factor. Note whether the emissions are based on actual volumetric measures in the next column.
Explanatory Notes / Comments	
Component Fugitive Leaks	
ID	
Geographic Location	GIS, zip code, or equivalent
Station Classification	A1 = above grade, pressure <100 psi A2 = above grade, pressure =100-300 psi A3 = above grade, pressure >300 psi B1 = below grade, pressure <100 psi B2 = below grade, pressure =100-300 psi B3 = below grade, pressure >300 psi
DeviceType	C = connector OE = open-ended line M = meter P = pneumatic device PR = pressure relief valve V = valve O = other devices
Bleed Rate	L = low bleed I = intermittent bleed H = high bleed NA = not applicable
Manufacturer	
Pressure(psi)	MOP = maximum operating pressure over the past year
Discovery Date(MM/DD/YY)	List the actual discovery date. If the leak was discovered in the year of interest, then we will assume the component was leaking from the beginning of the year for emissions reporting purposes.
Repair Date(MM/DD/YY)	Date that the component repair stopped the leak. Any associated blowdowns as a result of the repair should be included in the blowdowns tab.
NumberofDays Leaking	Assume Leaking from January 1 of subject year or prior survey date, whichever is later, thru the repair date (if repaired in year of interest) or December 31 of subject year, whichever is earlier. For O&M discovered leaks, assume that the leak begins with the discovery date thru repair date or December 31st of subject year, whichever is earlier.
Emission Factor(Mscf/day)	
Annual Emissions(Mscf)	
Explanatory Notes / Comments	