SoCalGas, June 15, 2018
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 2018 June Report
Appendix 8; Rev. 03/31/18

Summary Tables:

System Categories	Emission Source Categories	Fugitive or Vented	For Reference Only: 2015 Baseline Emissions (Mscf)	2016 Total Annual Volume of Leaks & Emissions (Mscf)	2016 Total Annual Count of Leak & Emission Items	2017 Total Annual Volume of Leaks & Emissions (Mscf)	2017 Total Annual Count of Leak & Emission Items	2017 Explanatory Notes/Comments	Emission Change for Year Over Year Comparison from 2016 to 2017 [Mscf]	Percentage Emission Change for Year Over Year Comparison from 2016 to 2017	Count Change for Year Over Year Comparison from 2016 to 2017	Percentage Count Change for Year Over Year Comparison from 2016 to 2017	Explanation for Significant Percentage Change for Year Over Year Comparison from 2016 to 2017
Transmission Pipelines	Pipeline Leaks	Fugitive		1,297	Leak count: 8 Total System Mileage: 3,455	1,295	Leak count: 5 Total System Mileage: 3,448	This line item excludes the "Unusual Large Leak" to allow for comparison between 2016 and 2017. These emissions are provided on line #46 and included in the total.	(3)	(0.2%)	(7)	(0.2%)	For column L, the Transmission Pipeline Mileage went down by 7 miles. Column L reflects the change in pipeline miles only. The Leak Count went down by 3 but it is not reflected in column L.
	All Damages	Fugitive		0	Number of emission items: 0	2,000	Number of emission items: 1		2,000		1		
	Blowdowns	Vented		144,486	Number of blowdown events: 167	165,358	Number of blowdown events: 1,638	This line item excludes the associated blowdown for repair the "Unusual Large Leak" to allow for comparison between 2016 and 2017. These emissions are provided on line #46 and included in the total.	20,873	**14.4%**	1,471	**880.8%**	● The increase in blowdown emissions is due to an increase in pipeline inspection and maintenance for safety and integrity reasons. ● In 2016, for Transmission Odor Intensity Test SoCalGas reported the number of test sites (78). In 2017 SoCalGas reports the number of tests conducted at each site (961). For 2016, the total number of tests conducted for all sites was 968 which decreases the number of tests reported by 7. The associated emissions reported in 2016 was 0.203 Mscf which should have been 2.524 Mscf. In 2017 for 986 events the associated emissions is 2.49 Mscf which decreases the emissions from 2016 by 0.034 Mscf. ● In 2016 Pipeline Drips, Relief Valve Inspections, and Pneumatic Device Inspections were accounted for in Transmission M&R stations. In 2017, some were moved to Transmission Pipeline. ● Filter Change-outs is added as a new emissions category. This results in 5.01 Mscf from 167 events.
	Component Emissions	Vented		7,877	Number of devices: 313	7,393	Number of devices: 291		(484)	(6.1%)	(22)	(7.0%)	The number of pneumatic devices decreased because some devices were determined to be associated with Transmission M&R Stations.
	Component Leaks	Fugitive		0	Number of leaks: 23	0	Number of leaks: 68		-		45	**195.7%**	In 2017, as a result of the implementation of GO 112F, the leak survey requirements for all Transmission Pipelines went from annual to bi-annual, required the use of leak detecting equipment, and documentation of minor leak repairs. Emissions for component leaks are accounted for in the mileage based emissions factor, and reported in Transmission Pipeline Leaks.
	Odorizers	Vented		2,261	Number of units: 245	2,346	Number of units: 242		85	**3.7%**	(3)	(1.2%)	
Transmission M&R Stations	Station Leaks & Emissions	Fugitive		287,561	Number of facilities: 9,409	308,458	Number of facilities: 10,869	New PHMSA requirements include inspections and leak surveying first stage regulators every three years, while the high pressure service requires annual survey. This is expected to provide actual leak data, which may be used in future reports.	20,897	**7.3%**	1,460	**15.5%**	Pursuant to PHMSA maintenance requirements effective in 2017, SoCalGas performed a field verification on high pressure tap facilities and updated the enterprise system with 1,458 additional field-verified tap facilities. These taps were previously tracked manually and did not show up in previous enterprise system queries.
	Blowdowns	Vented		266	Number of blowdown events: 2,604	320	Number of blowdown events: 3,515		54	**20.3%**	911	**35.0%**	Blowdowns emissions are a function of activity level. The increased inspections of transmission taps is due to increased field verification caused the increases in count and emissions.
	Component Emissions	Vented		5,047	Number of devices: 133	1,916	Number of devices: 162		(3,131)	(62.0%)	29	**21.8%**	The number of pneumatic devices increased because some devices were previously reported under Transmission Pipelines. The emission reported are lower because 18 of the 29 devices classified as high bleed valves in 2016 were field verified and reclassified as low-bleed devices. In addition, two of the 29 high-bleed devices were identified to be operating on compressed air and have no emissions.
	Component Leaks	Fugitive		0	Number of leaks: 23	0	Number of leaks: 13		-		(10)	(43.5%)	The number of component leaks decreased because some devices were determined to be associated with Distribution M&R Stations.
Transmission Compressor Stations	Compressor Emissions	Vented		32,544	Number of compressors: 39	47,392	Number of compressors: 37		14,847	**45.6%**	(2)	(5.1%)	While there are variabilities from one measurement to another, the contributing factor for the increase in emissions from 2016 to 2017 is primarily due to an increase in operating hours.
	Compressor Leaks	Fugitive		0	Leaks on compressor piping are reported as "component leaks"	N/A	N/A	This worksheet was combined with Component Leaks worksheet in 2017 template.					
	Blowdowns	Vented		11,552	Number of blowdown events: 121	9,613	Number of blowdown events: 675		(1,939)	(16.8%)	554	**457.9%**	In 2016 blowdown events may have been aggregated and blowdown count may not be reflective of actual operational activity. In 2017 an IT system was implemented that tracks and reports all blowdown activities, including small blowdowns that were previously aggregated. In addition, a study was performed to measure blowdown volumes to more accurately estimate blowdown emissions.
	Component Emissions	Vented		5,079	Number of devices: 243	4,301	Number of devices: 207		(778)	(15.3%)	(36)	(14.8%)	The decrease in emissions was due to some equipment not operating.
	Component Leaks	Fugitive		17,836	Number of leaks: 340	15,044	Number of leaks: 350		(2,793)	(15.7%)	10	**2.9%**	The decrease in emissions is due primarily to changes in methodology for determining the number of days leaking per template change.
	Storage Tank Leaks & Emissions	Vented		0	Number of emission items: 0	275	Number of emission items: 7		275		7		Vented emissions from this category of equipment was previously combined with Transmission M&R Stations Blowdowns, therefore, no year over year change is calculated.
Distribution Main & Service Pipelines	Pipeline Leaks	Fugitive		838,046	Number of known leaks: 16,580 Estimated number of unknown leaks: 6,423 Total number of leaks: 23,003	698,058	Number of known leaks: 18,441 Estimated number of unknown leaks: 3,899 Total number of leaks*: 22,340	*This line item includes the estimated emissions from the estimated number of unsurveyed pipeline leaks.	(139,988)	(16.7%)	(663)	(2.9%)	● The reduction in number of unknown leaks from 6,423 to 3,899 is primarily due to the discovery of data that permitted allocation of known leaks from the category of Routine Leak Survey to O&M Activities. The estimated number of unknown leaks and total emissions for this line item cannot be compared between 2016 and 2017 data due to refinement of information that occurred between the report years. ● The change in number of known leaks should be considered to be normal year-over-year variation due to variables in different areas surveyed year to year, variability in the operating environment, and variation in the rate at which system leaks develop. In addition, the equation used to calculate the number of unknown leaks was corrected as approved by SED to avoid overstating the emissions when using actual survey miles. The correction to the equation is explained in the Appendix 4 under "Unsurveyed Pipeline Leaks" tab. ● Based on the corrected equation, the estimated number of unknown leaks changed from 4,219 to 3,899 for 2017. The emissions estimate for Distribution Main & Service Pipeline unknown leaks category changed from 177,457 Mscf to 163,687 Mscf.
	All Damages	Fugitive		71,170	Number of damages: 3,566	75,722	Number of damages: 3,455		4,552	**6.4%**	(111)	(3.1%)	

System Categories	Emission Source Categories	Fugitive or Vented	For Reference Only: 2015 Baseline Emissions (Mscf)	2016 Total Annual Volume of Leaks & Emissions (Mscf)	2016 Total Annual Count of Leak & Emission Items	2017 Total Annual Volume of Leaks & Emissions (Mscf)	2017 Total Annual Count of Leak & Emission Items	2017 Explanatory Notes/Comments	Emission Change for Year Over Year Comparison from 2016 to 2017 [Mscf]	Percentage Emission Change for Year Over Year Comparison from 2016 to 2017	Count Change for Year Over Year Comparison from 2016 to 2017	Percentage Count Change for Year Over Year Comparison from 2016 to 2017	Explanation for Significant Percentage Change for Year Over Year Comparison from 2016 to 2017
[illegible]	Blowdowns	Vented		227	Number of blowdown events: 402	1,098	Number of blowdown events*: 3,160	*Individual event data for Pipeline Abandonment is not available.	871	**384.0%**	2,758	**686.1%**	● The majority of the increase in blowdown emissions is due to two high pressure leak repairs, one of which included repairing a leaking main line valve. ● In 2016, for Distribution Odor Intensity Test SoCalGas reported the number of test sites (387). In 2017 SoCalGas reported the number of tests conducted at each site (3,153). For 2016, the total number of tests conducted for all sites was 3,280 which decreases the number of tests reported by 127. The associated emissions reported in 2016 was 1.009 Mscf which should have been 8.554 Mscf. In 2017 for 3,153 events the associated emissions is 8.22 Mscf which decreases the emissions from 2016 by 0.334 Mscf.
	Component Emissions	Vented		0	Number of emission items: 0	0	Number of emission items: 0	No Devices	-		-		
	Component Leaks	Fugitive		55	Number of leaks: 10	142	Number of leaks: 12		87	**157.6%**	2	**20.0%**	This is due to normal year over year variation in the number of leaks. The increase in emissions is due to variation in the component material. More of the leaks in 2017 were unprotected steel, which has an emissions factor more than double that of protected steel. There was also a plastic component leak in 2017, which has an emissions factor four times higher than protected steel.
Distribution M&R Stations	Station Leaks & Emissions	Fugitive		346,308	Number of stations: 1,957	348,097	Number of stations: 1,963		1,789	**0.5%**	6	**0.3%**	
	All Damages	Fugitive				23	Number of damages: 1	This tab is added to this year template.	23				This is a new worksheet in this appendix so there is no year-over-year comparison
	Blowdowns	Vented		101	Number of blowdowns*: 19,490	100	Number of blowdowns*: 18,529	*Individual event data for Pipeline Abandonment at Reg Station is not available.	(1)	**(1.3%)**	(961)	**(4.9%)**	The reduced count is due to: •A decrease in regulator station inspections, which is normal year-to-year variation. •A decrease in relief valve inspections from 147 in 2016 to 39 in 2017. The 2017 count came from actual recorded orders whereas the 2016 count was an estimation. •A decrease in BTU District Meter Orifice Plate Inspection from 144 in 2016 to 64 in 2017. In 2017 BTU District Orifice Meters were replaced with Clamp-on Ultrasonic Meters that are inspected annually rather than monthly. •Filter Change-outs is added as a new emissions category. This results in 0.24 Mscf from 8 events.
	Component Emissions	Vented		0	Number of devices: 68	0	Number of devices: 73	Emissions for this category are accounted for in Station Leaks & Emissions, Distribution M&R Above Grade Station emission factors.	-		5	**7.4%**	SoCalGas's databases used for reporting historically were not designed to report individual component level details. A more in-depth analysis was performed in 2017, updating our estimated count of each component type. Per the request in Best Practice 9, SoCalGas plans to update the databases with component level details to further improve reporting capabilities.
	Component Leaks	Fugitive		0	Number of leaks: 584	0	Number of leaks: 851		-		267	**45.7%**	The increase in the count is due to documentation of minor leaks. The emissions for Component Leaks are included in the facility based emission factor and reported in Station Leaks & Emissions.
Customer Meters	Meter Leaks	Fugitive		851,086	Number of meters: 5,929,463	855,950	Number of meters: 5,962,376		4,864	**0.6%**	32,913	**0.6%**	
	All Damages	Fugitive		14,245	Number of damages: 1,512	23,733	Number of damages: 1,869		9,488	**66.6%**	357	**23.6%**	The increase in the count is due to documentation of minor leaks.
	Vented Emissions	Vented		1,687	Number of blowdown events: 1,486,623	1,303	Number of blowdown events: 1,011,289		(384)	**(22.8%)**	(475,334)	**(32.0%)**	One of the main reasons for the decrease in both count and emissions is due to the conclusion of AMI deployment.
	Above Ground MSA Leaks	Fugitive		0	Number of leaks: 68,034	0	Number of leaks: 68,073		-		39	**0.1%**	
	Component Emissions	Vented		0	Number of devices: 82	0	Number of devices: 82		-		-	**0.0%**	
Underground Storage	Storage Leaks & Emissions	Fugitive		2,744	This line item excludes the "Unusual Large Leak" to allow for comparison between 2016 and 2017. These emissions are provided on line #46 and included in the total. Number of emission items: 5,156	2,083	Number of emissions items: 4,846		(661)	**(24.1%)**	(310)	**(6.0%)**	In 2017 leak duration was based on 5-day repairs to estimate emissions of leaks at Aliso Canyon wellheads, whereas in 2016 a 7-day repair was applied.
	Compressor Emissions	Vented		19,362	Number of compressors: 37	31,170	Number of compressors: 38		11,808	**61.0%**	1	**2.7%**	While there are variabilities from one measurement to another, the contributing factor for the increase in emissions from 2016 to 2017 is primarily due to an increase in operating hours.
	Compressor Leaks	Fugitive		0	Leaks on compressor piping are reported as "component leaks"	N/A	N/A	This worksheet was combined with Component Leaks worksheet in 2017 template.					
	Blowdowns	Vented		6,261	Number of blowdown events: 2,292	7,276	Number of blowdown events*: 3,713	*Data is aggregated. Number of blowdown events is not available.	1,015	**16.2%**	1,421	**62.0%**	Blowdown data may be aggregated over multiple blowdown events and aggregation may be inconsistent from year to year so changes in blowdown count are not reflective of actual operational activity. In 2017, there was an increase in compressor cycling to meet system operational demands and support well integrity work under SIMP. This contributed to both the increase in count and emissions.
	Component Emissions	Vented		5,518	Number of devices: 263	6,933	Number of devices: 331		1,415	**25.6%**	68	**25.9%**	In 2016 the pneumatic device count was reported based on previous GHG reports for some storage facilities. A field verification is in process, resulting in a more accurate component count. The increase in emissions is directly proportional to the increased count due to emission factor based estimation.
	Component Leaks	Fugitive		29,506	Number of leaks: 295	20,870	Number of leaks: 682		(8,636)	**(29.3%)**	387	**131.2%**	This increase in count change can be attributed to increased surveys and improved documentation of minor leaks. The decreased emissions can be attributed to a change in emission calculation methodology per template change.
	Dehydrator Vent Emissions	Fugitive		7,458	Number of facilities: 5	0	Number of facilities: 4		(7,458)	**(100.0%)**	(1)	**(20.0%)**	These facilities all have vapor recovery or vapor control units and therefore do not emit natural gas. The template was updated in 2017 to revise emission estimations. Based on the revised template, emissions should have been reported as 0 for 2016.
Unusual Large Leaks	(Description)		3,630,000	990,000	Number of events: 1	60,159	Number of events: 1	Line 235 rupture occurred on October 1st, 2017. The emissions of the leak and its associated blowdown for repair are reported in Appendix 1 as 29,500 and 30,659 Mscf, respectively.	(929,841)	**(93.9%)**	-	**0.0%**	The increase in emissions is due to a single event (Line 235 rupture).
		Total	**6,409,853**	**3,699,580**		**2,698,427**				-27%			

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System Wide Leak Rate Data

1/1/2017 - 12/31/2017

The highlighted cells show the volumes that are summed together as the throughput for calculating the system wide leak rate.

This methodology overestimates system throughput. We recommend using storage withdrawal as opposed to storage injection.

Gas Storage Facilities:

Average Close of the Month Cushion Gas Storage Inventory (Mscf)	Average Close of the Month Working Gas Storage Inventory (Mscf)	Total Annual Volume of Injections into Storage (Mscf)	Total Annual Volume of Gas Used by the Gas Department (Mscf)	Total Annual Volume of Withdrawals from Storage (Mscf)	Explanatory Notes / Comments
141,087,404	52,947,344	48,020,920	934,652	40,008,397	

Transmission System:

Total Annual Volume of Gas Used by the Gas Department (Mscf)	Total Annual Volume of Gas Transported to or for Customers* in State (Mscf)	Total Annual Volume of Gas Transported to or for Customers* out of State (Mscf)	Total Annual Volume of Gas Transported to utility-owned or third-party storage fields for injection into storage (Mscf)	Explanatory Notes / Comments
1,673,232	899,665,467	11,112,778	48,020,920	

Distribution System:

Total Annual Volume of Gas Used by the Gas Department (Mscf)	Total Annual Volume of Gas Transported to or for Customers* in State (Mscf)	Total Annual Volume of Gas Transported to or for Customers* out of State (Mscf)	Explanatory Notes / Comments
204,327	757,319,848	0	

*The term customers includes anyone that the utility is transporting gas for, including customers who purchase gas from the utility.

Customers can be anyone including residential, businesses, other utilities, gas transportation companies, etc.

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Summary Tables:

Natural Gas Properties	Average Mole Percent	Explanatory Notes / Comments
Methane	94%	Interstate supplies
Carbon Dioxide	0.8%	Interstate supplies
Ethane	3.9%	Interstate supplies
C3+	0.3%	Interstate supplies
C6+	0.004%	Interstate supplies
Oxygen	0.2%	Estimated to limit, Not Tested at all locations
Hydrogen		Not Tested
Sulfur	0.0002%	Estimated to include odorant
Water	0.01%	Estimated to limit
Carbon Monoxide		Not Tested
Particulate Matter		Not Tested
Inert Gas	1.7%	Interstate supplies
Odorant	0.0002%	Estimated guideline rate