

2018 REPORTING TEMPLATE WORKSHOP UNDERGROUND STORAGE – WELLHEAD FACTORS

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Appendix 7 – Underground Storage Wellhead Leaker Emission Factors

Table W-4A to Subpart W of Part 98—Default Total Hydrocarbon Leaker Emission Factors for Underground Natural Gas Storage

Table W-4A to Subpart W of Part 98—Default Total Hydrocarbon Leaker Emission Factors for Underground Natural Gas Storage

Underground natural gas storage	Emission factor (scf/hour/component)	
	If you survey using any of the methods in §98.234(a)(1) through (6)	If you survey using Method 21 as specified in §98.234(a)(7)
Leaker Emission Factors—Storage Station, Gas Service		
Valve ¹	14.84	9.51
Connector (other)	5.59	3.58
Open-Ended Line	17.27	11.07
Pressure Relief Valve	39.66	25.42
Meter and Instrument	19.33	12.39
Other ²	4.1	2.63
Leaker Emission Factors—Storage Wellheads, Gas Service		
Valve ¹	4.5	3.2
Connector (other than flanges)	1.2	0.7
Flange	3.8	2.0
Open-Ended Line	2.5	1.7
Pressure Relief Valve	4.1	2.5
Other ²	4.1	2.5

¹Valves include control valves, block valves and regulator valves.
²Other includes any potential equipment leak emission point in gas service that is not specifically listed in this table, as specified in §98.232(f)(6) and (8).
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Table W-4B to Subpart W of Part 98—Default Total Hydrocarbon Population Emission Factors for Underground Natural Gas Storage

Table W-4B to Subpart W of Part 98—Default Total Hydrocarbon Population Emission Factors for Underground Natural Gas Storage

Underground natural gas storage	Emission factor (scf/hour/component)
Population Emission Factors—Storage Wellheads, Gas Service	
Connector	0.01
Valve	0.1
Pressure Relief Valve	0.17
Open-Ended Line	0.03
Population Emission Factors—Other Components, Gas Service	
Low Continuous Bleed Pneumatic Device Vents ¹	1.37
High Continuous Bleed Pneumatic Device Vents ¹	18.20
Intermittent Bleed Pneumatic Device Vents ¹	2.35

¹Emission Factor is in units of "scf/hour/device."
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Table 4
Default Total Hydrocarbon Emission Factors for Underground Natural Gas Storage

Underground natural gas storage	Emission Factor (scf/hour/component)
Leaker Emission Factors – Storage Station, Gas Service	
Valve ¹	14.84
Connector	5.659
Open-Ended Line	17.27
Pressure Relief valve	39.66
Meter	19.33
Population Emission Factors – Storage Wellheads, Gas Service	
Connector	0.01
Valve ¹	0.1
Pressure Relief Valve	0.17
Open Ended Line	0.03
Population Emission Factor – Other Components, Gas Service	
Low Continuous Bleed Pneumatic Device Vents ²	1.37
High Continuous Bleed Pneumatic Device Vents ²	18.20
Intermittent Bleed Pneumatic Device Vents ²	2.35

¹ Valves include control valves, block valves and regulator valves.
² Emission Factor is in units of "scf/hour/device."

Appendix 7 – Underground Storage Wellhead Leaker Emission Factors

Component Type	Device Type	EPA MRR Table W-4 Subpart W			CARB MRR Table 3			SB-1371 Appx 9		Recommendation
		[scf/hr]	[Mscf/day]	[Mscf/yr]	[scf/hr]	[Mscf/day]	[Mscf/yr]	[Mscf/day]	[Mscf/yr]	[Mscf/day]
Leaker EFs – Storage Station, Gas Service	Valve	14.84	0.3562	129.998	14.84	0.3562	129.998		129.998	
	Connector	5.59	0.1342	48.968	5.659	0.1358	49.573		49.573	Investigate difference
	Open-Ended Line	17.27	0.4145	151.285	17.27	0.4145	151.285	Storage – piping leakage	151.285	
	Pressure Relief Valve	39.66	0.9518	347.422	39.66	0.9518	347.422		347.422	
	Meter	19.33	0.4639	169.331	19.33	0.4639	169.331		169.331	
	Other	4.1	0.0984	35.916	No reference	N/A	N/A		No reference	Adopt EPA EF
Leaker EFs – Storage Wellheads, Gas Service	Valve	4.5	0.1080	39.420	No reference	N/A		Storage – Wellhead leakage	Engineering estimate: leak survey + extrapolation	Adopt EPA MRR EFs
	Connector (other than flanges)	1.2	0.0288	10.512						
	Flange	3.8	0.0912	33.288						
	Open-Ended Line	2.5	0.0600	21.900						
	Pressure Relieve Valve	4.1	0.0984	35.916						
	Other	4.1	0.0984	35.916						
Population EFs – Storage Wellheads, Gas Service	Connector	0.01	0.0002	0.0876	0.01	0.0002	0.0876	Storage – piping leakage	0.0876	No longer needed due to CARB Oil & Gas Rule
	Valve	0.1	0.0024	0.876	0.1	0.0024	0.876		0.876	
	Pressure Relief Valve	0.17	0.0041	1.489	0.17	0.0041	1.489		1.489	
	Open Ended Line	0.03	0.0007	0.2628	0.03	0.0007	0.2628		0.2628	

Thank you!

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