Correction to Measurements of Methane Emissions from Natural Gas Gathering Facilities and Processing Plants: Measurement Results

Austin L. Mitchell, Daniel S. Tkacik, Joseph R. Roscioli, Scott C. Herndon, Tara I. Yacovitch, David M. Martinez, Timothy L. Vaughn, Laurie Williams, Melissa Sullivan, Cody Floerchinger, Mark Omara, R. Subramanian, Dan Zimmerle, Anthony J. Marchese, and Allen L. Robinson*

Ⓢ Supporting Information

The authors of this manuscript seek to clarify two assumptions and calculations.

1. Partner companies reported facility throughput of natural gas to the study team as a volumetric flow rate. In the manuscript, facility throughput was reported as a mass flow rate (tonnes/h); the conversion from volumetric to mass based flow was done using the molecular weight of methane for natural gas. This was done because the average natural gas composition for 2012 and 2013 at each facility was not known. This is a lower bound estimate of the mass based throughput; the magnitude of the bias depends on the actual natural gas composition. We have provided an updated version of Table S.2 that contains the throughput data for each facility on a volumetric flow rate basis as reported by the partner companies. This update does not alter any of the methane emission rates (FLER or WAFLER) or normalized emission rates (tnWAFLER) reported in the manuscript (these values were determined before converting the facility throughput data to a mass basis).

2. At some of the study facilities the natural gas composition was measured at two locations (e.g., facility inlet and outlet). For these facilities, the normalized methane loss rates (tnWAFLER) reported in the manuscript were calculated using the maximum reported methane mixing ratio at a given facility. For example, if the inlet gas was 85% methane (mol %) and the outlet was 95% methane, 95% was used to calculate methane throughput. This will reduce the tnWAFLER value. While the gas composition undergoes negligible change at C (compression) and C/D (compression + dehydration) facilities, this assumption impacts tnWAFLER calculations at C/D/T (compression + dehydration + treatment), D/T (dehydration + treatment) and P (processing) facilities. In the manuscript we only provided gas composition data measured at the inlet of C/D/T, D/T, and P facilities (SI B, Table S1). Outlet gas composition data are provided in Table 1.

Table 1. C/D/T, D/T, and P Facility Outlet Natural Gas Composition[a]

facility no.	facility type	% CH_4	% C_2H_6	% C_3H_8	% C_4+	% CO_2	% N_2	% H_2S
102	C/D/T	76.4	13.7	6.0	3.2	0.4	0.2	-
103	C/D/T	NR	NR	NR	NR	NR	NR	NR
104	C/D/T	80.1	10.9	5.8	2.8	<0.01	0.4	-
105	C/D/T	90.8	4.8	1.6	1.3	1.2	0.3	-

Table 1. continued

facility no.	facility type	% CH_4	% C_2H_6	% C_3H_8	% C_4+	% CO_2	% N_2	% H_2S
106	C/D/T	90.0	5.4	2.0	1.8	0.6	0.2	-
107	C/D/T	NR	NR	NR	NR	NR	NR	NR
108	C/D/T	74.7	14.2	6.4	3.8	0.9	0.1	<0.01
109	C/D/T	76.8	13.2	5.5	1.8	2.1	0.7	<0.01
115	D/T	NR	NR	NR	NR	NR	NR	NR
116	P	91.5	5.2	1.2	0.5	1.5	0.1	-
117	P	98.6	0.5	0.02	0.0	0.6	0.3	-
118	P	NR	NR	NR	NR	NR	NR	NR
119	P	96.6	2.1	0.3	0.2	0.4	0.5	-
120	P	94.0	5.3	0.2	0.02	0.2	0.3	-
121	P	79.6	13.8	3.4	0.6	1.8	0.7	-
122	P	NR	NR	NR	NR	NR	NR	NR
123	P	94.0	5.1	0.2	-	-	0.3	-
124	P	NR	NR	NR	NR	NR	NR	NR
125	P	85.4	13.7	0.3	0.4	0.2	0.4	-
126	P	NR	NR	NR	NR	NR	NR	NR
127	P	94.3	5.5	0.1	0.04	-	0.1	-
128	P	92.4	6.0	0.3	0.1	1.0	-	-
129	P	98.8	0.4	0.1	0.1	0.4	0.3	-
130	P	NR	NR	NR	NR	NR	NR	NR
131	P	NR	NR	NR	NR	NR	NR	NR

[a]Composition data are reported in mole fractions (mol/mol). These data are from gas chromatography analysis performed by study partners at the time closest to the tracer flux measurements. NR indicates not recorded, usually because the value was unknown.

■ ASSOCIATED CONTENT

Ⓢ **Supporting Information**

The Supporting Information is available free of charge on the ACS Publications website at DOI: 10.1021/acs.est.5b04018.

Tables S1, S2, S3, S6, S7, S8, S12 (XLSX)