Section K: Monitoring Data from Stack sampling

To be filled by the Environmental Laboratory.

Instructions: Stack sampling to be done at one stack per industry. J-PAL Staff will identify the stack.

K1.1a	**Industry ID**	GJS|___|___|___|
K1.1b	**Stack ID**	S|_____|
K1.2	**Is there a sampling port at this location?**	1. ☐ Yes →***complete Section 3.1*** 2. ☐ No→***skip Section 3.1***
K1.3	**Sample number**	1. ☐ One 2. ☐ Two
K1.4	**Is complete sampling report attached?**	1. ☐ Yes 2. ☐ No *(Specify Why?)* _____
K1.5	**Date of Sampling***(DD/MM/2014)*	|__ __| / |__ __|/ 2016
K1.6	**Time of Sampling** *(24-hour format)*	Start Time |_____|hrs|_____|mins End Time |_____|hrs|_____|mins
K1.7	**Shape of duct cross-section**	1. ☐ Round 2. ☐ Rectangular →**Skip to K1.8b**

			Unit of Measurement	Preferred Unit
K1.8a	**Duct cross-section internal dimensions** *(round)*	Diameter: |_____|		Meters
K1.8b	**Duct cross-section internal dimensions** *(rectangular)*	Length: |_____|		Meters
		Breadth: |_____|		
K1.9	**Location of Sampling Port**	Distance from nearest upstream bend: |_____|		Meters
		Distance from nearest downstream bend: |_____|		
K1.10	**Diameter of the port**			Meters
K1.11	**Collar length at the port**			Meters
K1.12	**Maximum operating load of Boiler**			KPa
K1.13	**Operating load at the time of Sampling**			KPa

Comments p1:

			Unit of Measurement	Preferred Unit
K1.14	**Maximum operating load of Thermopack**			^{O} Celsius
K1.15	**Operating load at the time of sampling**			^{O} Celsius
K1.16	**Average CO_2**			PPM
K1.17	**Average O_2**			PPM
K1.18	**Average SO_X**			PPM
K1.19	**Average NO_x**			PPM
K1.20	**Average CO concentration**			PPM
K1.21	**Average Moisture content**			%
K1.22	**Average Flue Gas Temperature**			^{O} Celsius
K1.23	**Gas Molecular Weight**			mg
K1.24	**Static Pressure**			mmwc
K1.25	**Average Velocity Measurement**			m/sec
K1.26	**Thimble Weight before sampling**			mg
K1.27	**Thimble weight after sampling**			mg
K1.28	**Volume of gas collected**			m^3
K1.29	**Average PM Concentration**			mg/Nm3
K1.30	**Average Gas Flow**			Nm3/hr
K1.31	**Isokineticity**			%
K1.32	**Dust Loading**			kg/hr
K1.33	**Ambient Air Temperature**			^{O} Celsius
K1.34	**Ambient Air Humidity**			

Comments p2:

				Unit of Measurement	Preferred Unit
1	**Barometric Pressure (P_{bar})**				mm Hg
2	**Dry Molecular Weight (M_d)** M_d = 0.44*(%CO_2)+0.32*(%O_2)+0.28*(%N_2+%CO)				
3	**Volume of condensate (V_c) in ml**				ml
4	**Suction at meter (P_m)**	Initial (P_{m0})			mm Hg
		Final (P_{m1})			mm Hg
5	**Equivalent Vapor of Condensate (V_v)** V_v = {(V_C *22.4)/18*1000)} × (T_m /273) × {760/(P_{bar} - P_m)}				m^3
6	**Moisture in flue gas (M%)** M% = { V_v / (V_v + V_m)} * 100				%
7	**Proportion of Water Vapor (B_{wo})** B_{wo} = {V_v / (V_v + V_m)}				
8	**Wet Molecular Weight (M_s)** M_s = M_d (1 – B_{wo}) + 18 B_{wo}				
9	**Stack Gas Velocity (U_s)** U_s = K_P * C_P * {(ΔP)$^{0.5}$} X {T_S /(P_S * M_S)} 0.5				m/s
10	**Dry stack gas volumetric flow rate (Q_s)** Q_s = {3600 * U_S * A_S * (1 – B_{wo})} * {(T_S /T_{STD}) * (P_S /P_{STD})				Nm^3/hr

Comments p3: