



On August 5, 2019, at approximately 11:09 PM, the plant lost all electrical power, which caused the dryer to vent to atmosphere and a loss of water flow to the fermentation scrubber. Once the utility could be reconnected, water flow to the scrubber was re-established at approximately 11:39 PM. The distillation process shut down with the power outage, and the distillation scrubber was put online prior to restarting the process. Excess emissions from this event are summarized below.

**Table 1 - Estimated Uncontrolled Dryer VOM/HAP Emissions
 Plant Power Outage on August 5, 2019 at 11:09 PM**

When plant power was interrupted, the dryer emergency relief vent immediately opened to atmosphere. The dryer, dryer RTO, and all dryer fans lost power and stopped operating. Due to the lack of air flow through the dryer it took an extended period of time for the outlet dryer temperature to reach 130°F - the point at which VOM and HAP emissions are negligible. Due to the lack of air flow, excess emissions would have been minimal; however, for the purpose of this emission estimate we have calculated emissions as if this was a typical dryer shutdown with continuing air flow and a typical period of 90-minutes to reach an outlet temperature of 130°F resulting in a conservative estimate of actual emissions.

5-Aug-19 11:09 PM Parameter	Dryer By-Pass Uncontrolled Emissions	
	(lbs)	tons
Duration	90 min	
PM/PM10	1.95	0.001
CO	16.79	0.008
VOM	67.56	0.034
Total HAPs	4.60	0.002
Acetaldehyde	1.149	0.001
Acrolein	0.919	0.000
Formaldehyde	1.838	0.001
Methanol	0.689	0.000

Uncontrolled dryer VOM emissions based on May 2016 compliance testing.

**Table 2 - Estimated Uncontrolled Distillation Scrubber VOM/HAP Emissions
 Plant Power Outage on August 5, 2019 at 11:09 PM**

The distillation process emissions were ducted to the dryer RTO at the time of this event. When power to the dryer RTO was lost, power was also lost to the distillation process, resulting in a lack of airflow, so there were no uncontrolled process emissions during this event. The scrubber water flow was established prior to restarting distillation process operations.

Compound	Uncontrolled Distillation Scrubber VOM Emissions August 2003 Test (lb/hr)	Uncontrolled Distillation Scrubber VOM Emissions 0.00 Hrs	
		(lbs)	(tons)
Acetaldehyde (HAP)	4.62	0.00	0.0000
Formaldehyde (HAP)	0.00	0.00	0.0000
Acrolein (HAP)	0.00	0.00	0.0000
Methanol (HAP)	0.06	0.00	0.0000
Total HAPs	4.68	0.00	0.0000
Total VOM (MSF)	85.33	0.00	0.0000

**Table 3 - Estimated Uncontrolled Ring Dryer VOM/HAP Emissions
 Plant Power Outage on August 5, 2019 at 11:09 PM**

The ring dryer was operating at the time of this event, which caused EV-1836 (Dryer Exhaust to atmosphere Damper) to open immediately and vent to atmosphere. Since all power was lost, it took an extended time for the dryer to vent; however, the entire volume of air remaining in the dryer at the time of the outage is considered to be exhausted.

5-Aug-19 11:09 PM Parameter	Dryer By-Pass Uncontrolled Emissions	
	(lbs)	tons
PM/PM10	0.07	0.00004
CO	6.96	0.003
SO2	0.04	0.00002
VOM	14.74	0.007
Total HAPs	5.41	0.003
Acetaldehyde	4.095	0.002
Acrolein	1.310	0.001
Formaldehyde	3.276	0.002
Methanol	0.737	0.000

Uncontrolled ring dryer emissions are based on a calculation of the remaining volume of air in the dryer ductwork at the time the Dryer Exhaust opens to atmosphere.



**Table 4 - Estimated Uncontrolled Fermentation VOM/HAP Emissions
 Plant Power Outage on August 5, 2019 at 11:09 PM**

Water flow to the fermentation scrubber was lost at 11:09 PM. Water flow was re-established to the fermentation scrubber at 11:39 PM, resulting in a deviation time of 30 minutes. The estimate of uncontrolled emissions from this event is presented below.

Time 8/5/19 11:09 PM	Excess Emissions Duration (hrs)	Ferm. Tank #1		Ferm. Tank #2		Ferm Tank #3		Ferm Tank #4		Ferm Tank #5		Total VOM Uncontrolled (lbs)
		Tank Age (hrs)	VOM Uncontrolled (lbs)	Tank Age (hrs)	VOM Uncontrolled (lbs)	Tank Age (hrs)	VOM Uncontrolled (lbs)	Tank Age (hrs)	VOM Uncontrolled (lbs)	Tank Age (hrs)	VOM Uncontrolled (lbs)	
8/5/19 11 - 12 PM	0.50	39.00	56.95	24.00	129.70	9.00	93.39	69.00	2.83	54.00	14.44	297.3
Totals	0.50											297.30

Fermentation Process Emission Estimate

Compound	Uncontrolled VOM Emissions by FTIR		Estimated Uncontrolled Fermentation Emissions	
	Low Flow Uncontrolled VOM * (lb/hr)	Percent of Total VOM by FTIR (%)	Estimated Uncontrolled Fermentation Emissions	
			(lbs)	(tons)
Acetaldehyde	3.0000	0.8192%	2.4356	0.0012
Formaldehyde	0.3967	0.1083%	0.3220	0.0002
Acrolein	0.0000	0.0000%	0.0000	0.0000
Methanol	0.0200	0.0055%	0.0162	0.0000
Total HAPs			2.7739	0.0014
Total VOM (M25A)	366.20		297	0.15

a. Distribution of HAPs in VOM emissions based on uncontrolled emissions from August 2006 testing upstream of scrubber during low flow conditions.

**Table 5 - Estimated Total Uncontrolled VOM/HAP Emissions from Deviation Event
 Plant Power Outage on August 5, 2019 at 11:09 PM**

Compound	Estimated Uncontrolled VOM / HAP Emissions from Event	
	(lbs)	(tons)
Acetaldehyde (HAP)	7.68	0.0038
Formaldehyde (HAP)	5.44	0.0027
Acrolein (HAP)	2.23	0.0011
Methanol (HAP)	1.44	0.0007
Total HAPs	16.79	0.0084
Total VOM (MSF)	380	0.19