

## Stacks, Vents, and Fugitive Emission Sources at Gopher State Ethanol

### Process Stacks

Stack No.	Equipment	Description
1	boilers	emissions from fuel oil
2	beverage grain handling	not in use (brewery)
3	<b>DDGS dryer</b>	<b>tested several times</b>
4	DDGS loadout	truck loading dried DDGS
5	hammermill	dust from corn grinding
6	<b>distillation</b>	<b>tested</b>
7	beverage fermentation	not in use (brewery)
8	cooling exchanger	new vent through baghouse, stack 9
9	<b>DDGS storage</b>	<b>tested</b>
10	<b>ethanol fermentation</b>	<b>tested</b>
11	ethanol grain handling	dust emissions
12	reserved number	
13	reserved number	
14	reserved number	
15	yeast tank vent	
16	centrifuge vent	
17	cooker, brew kettle #1	not in use (brewery)
18	brew kettle #2	not in use (brewery)
19	swirl tank	not in use (brewery)
20	lauter tank	not in use (brewery)
21	lauter tun	not in use (brewery)
22	mash tun	not in use (brewery)

### Fugitive Emissions

Truck unloading, corn  
 Truck loading, DDGS, and ethanol  
 Leaking pipe fittings

## Chemicals identified through stack emission tests at Gopher State Ethanol

Acetaldehyde
Acetic acid
Acetone
Acrolein
Benzene
Carbonyl sulfide
Dimethyl sulfide
Ethanol
Ethylbenzene
Formaldehyde
Furfuraldehyde
Glycerol
Hydrogen sulfide
Lactic acid
MEK/butyrols
Methanol
Styrene
Tolualdehyde
Toluene

### Gopher State emission tests

October 12 and 13, 2000	dryer; VOC; opacity; before thermal oxidizer
November 7, 2000	distillation; VOC
November 7, 2000	fermentation; VOC
January 5, 2001	dryer; opacity; before thermal oxidizer
March 31, 2001	dryer; VOC; before thermal oxidizer
August 21, 2001	dryer; VOC; with thermal oxidizer
March 25, 2002	fermentation; VOC
March 25, 2002	distillation; VOC
July 9, 2003	fermentation; VOC
September 4, 2003	dryer; VOC; with thermal oxidizer