

GRI-GLYCalc VERSION 4.0 - EMISSIONS SUMMARY

Case Name: Springhill - 25 MMscfd Dehy 01 - 04/11/15
File Name: C:\Users\Clyde 08.19.14\Documents\000 - EcoLogic LLC - 08.18.14\02 - LMM -
Springhill CS\Springhill CS - GP5 - 08.08.15\00 - Att-Cb - Springhill CS - GP5 - 25
Dehy-01 GLYCALCalc - 04.11.15.ddf
Date: April 11, 2015

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	59.1509	1419.621	259.0808
Ethane	2.8164	67.595	12.3360
Propane	0.1809	4.342	0.7924
n-Hexane	0.0011	0.027	0.0048
2,2,4-Trimethylpentane	0.0012	0.028	0.0051
Benzene	0.0335	0.805	0.1468
Toluene	0.0583	1.400	0.2555
Ethylbenzene	0.0818	1.963	0.3583
Xylenes	0.1080	2.592	0.4729
Total Emissions	62.4321	1498.371	273.4528
Total Hydrocarbon Emissions	62.4321	1498.371	273.4528
Total VOC Emissions	0.4648	11.156	2.0359
Total HAP Emissions	0.2839	6.814	1.2435
Total BTEX Emissions	0.2816	6.759	1.2335

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Springhill - 25 MMscfd Dehy 01 - 04/11/15
File Name: C:\Users\Clyde 08.19.14\Documents\000 - EcoLogic LLC - 08.18.14\02 - LMM -
Springhill CS\Springhill CS - GP5 - 08.08.15\00 - Att-Cb - Springhill CS - GP5 - 25
Dehy-01 GLYCALCalc - 04.11.15.ddf
Date: April 11, 2015

DESCRIPTION:

Description: Wet Gas: 70 oF, 1000 psig
Pump: Kimray 21020 PV; 3.5 gpm

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 70.00 deg. F
Pressure: 1000.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.3320
Nitrogen	0.2620
Methane	97.3540
Ethane	1.9750
Propane	0.0770
n-Hexane	0.0001
2,2,4-Trimethylpentane	0.0001
Benzene	0.0001
Toluene	0.0001
Ethylbenzene	0.0001
Xylenes	0.0001

DRY GAS:

Flow Rate: 25.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 3.5 gpm

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Springhill - 25 MMscfd Dehy 01 - 04/11/15
File Name: C:\Users\Clyde 08.19.14\Documents\000 - EcoLogic LLC - 08.18.14\02 - LMM -
Springhill CS\Springhill CS - GP5 - 08.08.15\00 - Att-Cb - Springhill CS - GP5 - 25
Dehy-01 GLYCALCalc - 04.11.15.ddf
Date: April 11, 2015

DESCRIPTION:

Description: Wet Gas: 70 oF, 1000 psig
Pump: Kimray 21020 PV; 3.5 gpm

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	59.1509	1419.621	259.0808
Ethane	2.8164	67.595	12.3360
Propane	0.1809	4.342	0.7924
n-Hexane	0.0011	0.027	0.0048
2,2,4-Trimethylpentane	0.0012	0.028	0.0051
Benzene	0.0335	0.805	0.1468
Toluene	0.0583	1.400	0.2555
Ethylbenzene	0.0818	1.963	0.3583
Xylenes	0.1080	2.592	0.4729
Total Emissions	62.4321	1498.371	273.4528
Total Hydrocarbon Emissions	62.4321	1498.371	273.4528
Total VOC Emissions	0.4648	11.156	2.0359
Total HAP Emissions	0.2839	6.814	1.2435
Total BTEX Emissions	0.2816	6.759	1.2335

EQUIPMENT REPORTS:

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages: 1.25
Calculated Dry Gas Dew Point: 0.93 lbs. H2O/MMSCF
Temperature: 70.0 deg. F
Pressure: 1000.0 psig
Dry Gas Flow Rate: 25.0000 MMSCF/day
Glycol Losses with Dry Gas: 0.0904 lb/hr
Wet Gas Water Content: Saturated
Calculated Wet Gas Water Content: 23.23 lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio: 9.04 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.99%	96.01%
Carbon Dioxide	99.75%	0.25%
Nitrogen	99.98%	0.02%
Methane	99.99%	0.01%
Ethane	99.95%	0.05%
Propane	99.92%	0.08%
n-Hexane	99.66%	0.34%
2,2,4-Trimethylpentane	99.75%	0.25%
Benzene	84.49%	15.51%
Toluene	77.07%	22.93%
Ethylbenzene	72.06%	27.94%
Xylenes	63.08%	36.92%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	55.95%	44.05%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
n-Hexane	0.37%	99.63%
2,2,4-Trimethylpentane	1.01%	98.99%
Benzene	4.96%	95.04%
Toluene	7.86%	92.14%
Ethylbenzene	10.37%	89.63%
Xylenes	12.88%	87.12%

STREAM REPORTS:

WET GAS STREAM

Temperature: 70.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 1.04e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	4.89e-002	2.42e+001
Carbon Dioxide	3.32e-001	4.01e+002
Nitrogen	2.62e-001	2.02e+002
Methane	9.73e+001	4.29e+004
Ethane	1.97e+000	1.63e+003
Propane	7.40e-002	8.96e+001
n-Hexane	1.00e-004	2.37e-001
2,2,4-Trimethylpentane	1.00e-004	3.14e-001

Benzene	1.00e-004	2.14e-001
Toluene	1.00e-004	2.53e-001
Ethylbenzene	1.00e-004	2.92e-001
Xylenes	1.00e-004	2.92e-001

Total Components	100.00	4.52e+004

DRY GAS STREAM

Temperature: 70.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 1.04e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)

Water	1.95e-003	9.66e-001
Carbon Dioxide	3.31e-001	4.00e+002
Nitrogen	2.62e-001	2.01e+002
Methane	9.74e+001	4.29e+004
Ethane	1.97e+000	1.63e+003
Propane	7.40e-002	8.95e+001
n-Hexane	9.97e-005	2.36e-001
2,2,4-Trimethylpentane	9.98e-005	3.13e-001
Benzene	8.45e-005	1.81e-001
Toluene	7.71e-005	1.95e-001
Ethylbenzene	7.21e-005	2.10e-001
Xylenes	6.31e-005	1.84e-001

Total Components	100.00	4.52e+004

LEAN GLYCOL STREAM

Temperature: 70.00 deg. F
Flow Rate: 3.50e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)

TEG	9.85e+001	1.94e+003
Water	1.50e+000	2.96e+001
Carbon Dioxide	5.00e-012	9.85e-011
Nitrogen	1.74e-013	3.43e-012
Methane	1.08e-017	2.12e-016
Ethane	1.93e-008	3.81e-007
Propane	1.46e-010	2.87e-009
n-Hexane	2.08e-007	4.09e-006
2,2,4-Trimethylpentane	6.09e-007	1.20e-005
Benzene	8.88e-005	1.75e-003
Toluene	2.53e-004	4.98e-003
Ethylbenzene	4.80e-004	9.46e-003
Xylenes	8.10e-004	1.60e-002

Total Components	100.00	1.97e+003

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 70.00 deg. F
Pressure: 1014.70 psia

Flow Rate: 3.69e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.43e+001	1.94e+003
Water	2.57e+000	5.28e+001
Carbon Dioxide	7.19e-002	1.48e+000
Nitrogen	1.37e-002	2.83e-001
Methane	2.87e+000	5.92e+001
Ethane	1.37e-001	2.82e+000
Propane	8.79e-003	1.81e-001
n-Hexane	5.39e-005	1.11e-003
2,2,4-Trimethylpentane	5.76e-005	1.19e-003
Benzene	1.71e-003	3.53e-002
Toluene	3.08e-003	6.33e-002
Ethylbenzene	4.43e-003	9.13e-002
Xylenes	6.02e-003	1.24e-001
Total Components	100.00	2.06e+003

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.94e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.52e+001	2.33e+001
Carbon Dioxide	6.56e-001	1.48e+000
Nitrogen	1.97e-001	2.83e-001
Methane	7.20e+001	5.92e+001
Ethane	1.83e+000	2.82e+000
Propane	8.01e-002	1.81e-001
n-Hexane	2.50e-004	1.11e-003
2,2,4-Trimethylpentane	2.01e-004	1.17e-003
Benzene	8.38e-003	3.35e-002
Toluene	1.24e-002	5.83e-002
Ethylbenzene	1.50e-002	8.18e-002
Xylenes	1.98e-002	1.08e-001
Total Components	100.00	8.75e+001