Table 1

Project Emission Potential – Valley In-Fill Expansion Landfill
Seneca Meadows Landfill
Waterloo, NY

	Potential Emissions using LE Flares										
	Seneca Meadows Landfill										
	NMOC	**VOC**	**CO**	**NOx**	**SO_2**	**PM-10**	**HAP**	**HCl**	**CO_2 eq**	**CH_4**	**H_2S**
	tpy	*tpy*	*tpy*	*tpy*	*tpy*	*tpy*	*tpy*	*tpy*	*tpy*	*tpy*	*tpy*
2017 Actual Emissions	54.83	23.62	50.06	21.85	20.73	1.82	6.88	0.83	277,630.07	7,281.65	8.61
2018 Actual Emissions	51.49	23.88	79.55	33.70	32.95	2.81	7.00	1.32	300,001.81	6,695.52	8.09
Existing Landfill Fugitive Totals (2039)	17.89	6.98	-	-	-	-	1.98	-	80,657.25	2,844.88	4.00
Existing Landfill Flare Totals (2039)	2.89	3.18	36.28	15.12	60.88	3.75	2.11	1.81	146,291.74	4.27	0.65
Rock Crushing/Screening	-	-	2.79	3.43	0.92	0.78	-	-	515.20	-	-
Storage Tanks	-	1.19	-	-	-	-	-	-	-	-	-
Leachate Treatment (RO)	-	0.05	-	-	-	-	0.002	-	-	-	-
Leachate Treatment (Evaporator)	-	0.02	-	-	-	-	0.02	-	-	-	0.17
Leachate Storage Tanks		0.00					0.00				
Emergency Genset (Exempt)	-	0.01	0.04	0.99	0.35	0.03	-	-	198.09	-	-
Soil Pile Storage (Exempt)	-	1.68	-	-	-	-	-	-	-	-	-
Heating Equipment (Exempt)	-	0.02	0.15	0.32	1.41	0.03	-	-	393.51	0.004	-
Odor Neutralizers (Exempt)	-	4.98	-	-	-	-	-	-	-	-	-
Expansion Landfill Fugitive Totals (2039)	39.41	15.37	-	-	-	-	4.36	-	177,728.53	6,268.70	8.82
Expansion Landfill Flare Totals (2039)	6.38	7.02	97.40	40.00	134.14	8.26	4.66	3.99	322,354.36	9.40	1.43
Baseline Actual Emissions (last 24 months)	**53.16**	**23.75**	**64.81**	**27.78**	**26.84**	**2.31**	**6.94**	**1.08**	**288,815.94**	**6,988.58**	**8.35**
2039 Facility PTE (lb/yr)	**91,579**	**44,776**	**194,798**	**79,998**	**268,286**	**16,520**	**18,024**	**7,988**	**1,000,165,778**	**12,556,204**	**20,502**
2039 Expansion PTE (tons/yr)	**45.79**	**22.39**	**97.40**	**40.00**	**134.14**	**8.26**	**9.01**	**3.99**	**500,082.89**	**6,278.10**	**10.25**
Increase difference (TPY)	*-7.4*	*-1.4*	*32.6*	*12.2*	*107.3*	*5.9*	*2.1*	*2.9*	*211,266.9*	*-710.5*	*1.9*
Significant Project Threshold (tons/yr)	-	40	100	40	40	15	-	10	75,000	-	10

Table 2

Summary of Landfill Gas Fugitive Emissions
Seneca Meadows Landfill

Year	Total LFG Generated	Collection Efficiency	LFG to Collection System	Fugitive LFG	Fugitive LFG	Fugitive LFG	Fugitive CH_4 Emissions	Oxidized CO_2 Emissions	Fugitive Biogenic CO_2 Emissions	Total Fugitive GHG Emissions
2039	(cfm)	(%)	(cfm)	(cfm)	(ft^3/yr)	(m^3/yr)	(TPY)	(TPY)	(TPY)	(TPY)
Existing & SELF	1,212	89%	1,079	133	70,091,172	1,984,761	667.1	203.3	2,235.9	18,913
SBO & WEX & NEX	3,958	89%	3,522	435	228,819,276	6,479,440	2,177.8	663.6	7,299.3	61,744
Valley Infill	11,392	89%	10,139	1,253	658,650,209	18,650,897	6,268.7	1,910.1	21,010.9	177,729
	16,562		14,740							

	17.9	tpy NMOC as Hexane @ 535 ppm	35,773.43	lbs of NMOC
Existing	7.0	tpy VOC	13,951.64	lbs of VOC
	39.4	tpy NMOC as Hexane @ 535 ppm	78,826.87	lbs of NMOC
Valley Infill	15.4	tpy VOC	30,742.48	lbs of VOC

Notes:

Total landfill gas (LFG) Generated based on LFG collected from Existing Landfill, SELF and Western Expansion Landfill
Collection efficiency of 89% assumed for gas collection system
LFG to Collection System = (Total LFG Generated) * (Collection Efficiency (%))
Fugitive LFG = (Total LFG Generated) * (100% - Collection Efficiency (%))
Fugitive LFG (ft^3/yr) = (Fugitive LFG (cfm)) * (60 minutes per hour) * (8,760 hours per year)
Fugitive LFG (m^3/yr) = (Fugitive LFG (ft^3/yr)) / (35.3147 cubic feet per cubic meter)
Fugitive CH_4 emissions (TPY) = [Fugitive LFG (ft^3/yr)] * [50% CH_4] * [0.0423 lb CH4 / ft^3 CH_4] * [90% oxidation factor] / [2,000 lb/ton]
Oxidized CO_2 emissions (TPY) = [Fugitive LFG (ft^3/yr)] * [50% CH_4] * [0.116 lb CO_2 / ft^3 CH_4] * [10% oxidized] / [2,000 lb/ton]
Fugitive Biogenic emissions (TPY) = { [Fugitive LFG (ft^3/yr)] * [50% CO_2] * [0.116 lb CO_2 / ft^3 CO_2] / [2,000 lb/ton] } + Oxidized CO_2 Emissions
Total GHG Emissions (tons CO_2 equivalents / year) = {[Fugitive CH_4 Emissions (TPY)] * 25} + {[Fugitive Biogenic Emissions (TPY)] * 1}

Table 3

Fugitive HAP Emissions
Seneca Meadows Landfill

Compound	CAS Number	Conc. µg/m^3*	Conc. Mg/m^3	FT^3/YR	LB/YR	LB/Hr	HAPs	LB/yr HAPs
Freon 12	75-71-8	7,200	7.20	957,560,656	430.48	0.0491		
Freon 114	76-14-2	436	0.44	957,560,656	26.04	0.0030		
vinyl chloride	75-01-4	2,100	2.10	957,560,656	125.56	0.0143	x	125.56
Freon 11	75-69-4	2,547	2.55	957,560,656	152.27	0.0174		
methylene chloride (dichloromethane)	75-09-2	4,155	4.16	957,560,656	248.42	0.0284	x	248.42
1,1-dichloroethane (ethylene dichloride)	75-34-3	1,147	1.15	957,560,656	68.57	0.0078	x	68.57
cis-1,2-dichloroethene	540-59-0	2,441	2.44	957,560,656	145.94	0.0167		
trichloroethene	79-01-6	2,174	2.17	957,560,656	129.97	0.0148	x	129.97
tetrachloroethene	127-18-4	5,188	5.19	957,560,656	310.15	0.0354	x	310.15
chlorobenzene	108-90-7	351	0.35	957,560,656	20.96	0.0024	x	20.96
1,4-dichlorobenzene	106-46-7	2,036	2.04	957,560,656	121.71	0.0139	x	121.71
1,2-dichlorobenzene	95-50-1	318	0.32	957,560,656	18.98	0.0022		
chloroethane (ethyl chloride)	75-00-3	510	0.51	957,560,656	30.47	0.0035	x	30.47
1,1,1- trichloroethane (methyl chloroform)	71-55-6	406	0.41	957,560,656	24.29	0.0028	x	24.29
benzene	71-43-2	5,269	5.27	957,560,656	315.01	0.0360	x	315.01
toluene	108-88-3	87,250	87.25	957,560,656	5,216.57	0.5955	x	5216.57
ethyl benzene	100-41-4	19,425	19.43	957,560,656	1,161.40	0.1326	x	1161.40
m,p-xylene	1330-20-7	38,750	38.75	957,560,656	2,316.81	0.2645	x	2316.81
o-xylene (1,2-dimethylbenzene)	95-47-6	10,806	10.81	957,560,656	646.09	0.0738	x	646.09
styrene	100-42-5	2,335	2.34	957,560,656	139.63	0.0159	x	139.63
1,3,5-trimythylbenzene	108-67-8	2,069	2.07	957,560,656	123.70	0.0141		
1,2,4-trimethylbenzene	95-63-6	5,140	5.14	957,560,656	307.31	0.0351		
4 methyl-2-pentanone (methyl isobutyl ketone)	108-10-1	4,613	4.61	957,560,656	275.78	0.0315	x	275.78
4-ethyltoluene	622-96-8	3,395	3.40	957,560,656	202.98	0.0232		
heptane	142-82-5	8,370	8.37	957,560,656	500.43	0.0571		
chlorodifluoromethane	75-45-6	5,500	5.50	957,560,656	328.84	0.0375		
d-limonene	5989-27-5	26,960	26.96	957,560,656	1,611.90	0.1840		
alpha-pinene	80-56-8	30,740	30.74	957,560,656	1,837.91	0.2098		
cyclohexane	110-82-7	3,680	3.68	957,560,656	220.02	0.0251		
ethanol	64-17-5	103,936	103.94	957,560,656	6,214.22	0.7094		
tetrahydrofuran	109-99-9	8,560	8.56	957,560,656	511.79	0.0584		
hexane	110-54-3	5,770	5.77	957,560,656	344.98	0.0394	x	344.98
2-propanol	67-63-0	30,860	30.86	957,560,656	1,845.08	0.2106		
acetone	67-64-1	32,563	32.56	957,560,656	1,946.87	0.2222		
2-Butanone (methyl ethyl ketone)	78-93-3	60,000	60.00	957,560,656	3,587.32	0.4095		
Acrolein[1]	107-02-8	574	0.57	957,560,656	34.34	0.0039		
Acrylonitrile[1] (Propenenitrile)	107-13-1	370	0.37	957,560,656	22.12	0.0025	x	22.12
ethyl acetate	141-78-6	14,515	14.52	957,560,656	867.83	0.0991	x	867.83
ethyl butyrate		43,000	43.00	957,560,656	2,570.92	0.2935		
ethyl valerate	539-82-2	7,600	7.60	957,560,656	454.39	0.0519		
1,2-dichloroethane	107-06-2	883	0.88	957,560,656	52.82	0.0060		
1,1-dichloroethene	75-35-4	173	0.17	957,560,656	10.35	0.2070	x	10.35
1,2-dichloropropane	78-87-5	158	0.16	957,560,656	9.42	0.1883	x	9.42
trichlorotrifluoroethane	26523-64-8	194	0.19	957,560,656	11.62	0.0013	x	11.62
trans-1,2-dichloroethene	156-60-5	163	0.16	957,560,656	9.72	0.0011		
methyl tert-butyl ether		275	0.28	957,560,656	16.44	0.0019		
2-hexanone	591-78-6	341	0.34	957,560,656	20.37	0.0023	x	20.37
propylene	115-07-1	20,000	20.00	957,560,656	1,195.77	0.1365		
1,3-butadiene	106-99-0	156	0.16	957,560,656	9.30	0.0011		
dichlorodifluoromethane								
1,2-Dichloro-1,1,2,2-tetrafluoroethane								
Acetonitrile	75-05-8	357	0.36	957,560,656	21.35	0.0024		
n-butyl acetate	123-86-4	3,413	3.41	957,560,656	204.03	0.0233		
n-octane	111-65-9	4,825	4.83	957,560,656	288.48	0.0329		
n-nonane	111-84-2	10,325	10.33	957,560,656	617.32	0.0705		
cumene	98-82-8	1,118	1.12	957,560,656	66.81	0.0076		
n-propylbenzene	103-65-1	916	0.92	957,560,656	54.78	0.0063	x	54.78
naphthalene	91-20-3	313	0.31	957,560,656	18.73	0.0021		

Table 3

Fugitive HAP Emissions
Seneca Meadows Landfill

Compound	CAS Number	Conc. µg/m^3*	Conc. Mg/m^3	FT^3/YR	LB/YR	LB/Hr	HAPs	LB/yr HAPs
hydrogen sulfide*	7783-06-46	429,102	429.10	957,560,656	25,655.46	2.9287		
carbonyl sulfide	463-58-1	1,771	1.77	957,560,656	105.89	0.0121	x	105.89
methyl mercaptan	74-93-1	6,026	6.03	957,560,656	360.29	0.0411		
dimethyl sulfide	75-18-3	10,929	10.93	957,560,656	653.41	0.0746		
carbon disulfide	75-15-0	1,117	1.12	957,560,656	66.80	0.0076	x	66.80
ethyl mercaptan		660	0.66	957,560,656	39.43	0.0045		
isopropyl mercaptan	75-33-2	12,858	12.86	957,560,656	768.74	0.0878		
tert-butyl mercaptan	75-66-1	998	1.00	957,560,656	59.65	0.0068		
ethyl methyl sulfide		547	0.55	957,560,656	32.68	0.0037		
thiophene	110-02-1	11,334	11.33	957,560,656	677.63	0.0774		
isobutyl mercaptan	513-44-0	1,348	1.35	957,560,656	80.61	0.0092		
2,5-dimethylthiophene		808	0.81	957,560,656	48.29	0.0055		
n-propyl mercaptan	107-03-9	461	0.46	957,560,656	27.55	0.0031		
dimethyl disulfide	624-92-0	300	0.30	957,560,656	17.94	0.0020		
3-methylthiophene	616-44-4	556	0.56	957,560,656	33.23	0.0038		
butanoic acid, ethyl ester	105-54-4	9,799	9.80	957,560,656	585.88	0.0669		
butane	106-97-8	25,345	25.35	957,560,656	1,515.35	0.1730		
butane, 2-methyl	78-78-4	76,589	76.59	957,560,656	4,579.14	0.5227		
2-propanol	67-63-0	46,085	46.09	957,560,656	2,755.38	0.3145		
2-butanol, (R)-	14898-79-4	50,393	50.39	957,560,656	3,012.92	0.3439		
1-butanol	71-36-3	19,578	19.58	957,560,656	1,170.56	0.1336		
alpha-pinene	80-56-8	96,326	96.33	957,560,656	5,759.22	0.6574		
decane	124-18-5	18,232	18.23	957,560,656	1,090.08	0.1244		
n-undecane		10,000	10.00	957,560,656	597.89	0.0683		
butanoic acid, 1-methylpropyl ester	819-97-6	28,955	28.96	957,560,656	1,731.19	0.1976		
limonene	138-86-3	39,885	39.89	957,560,656	2,384.68	0.2722		
Isopropanol		30,000	30.00	957,560,656	1,793.66	0.2048		
1-propanol		14,217	14.22	957,560,656	850.00	0.0970		
octane	111-65-9	20,000	20.00	957,560,656	1,195.77	0.1365		
propyl butyrate		14,900	14.90	957,560,656	890.85	0.1017		
n-nonane	111-84-2	30,000	30.00	957,560,656	1,793.66	0.2048		
1,2,4-trimethylbenzene		10,000	10.00	957,560,656	597.89	0.0683		
Propane		15,733	15.73	957,560,656	940.68	0.1074		
Isobutane		43,021	43.02	957,560,656	2,572.17	0.2936		
ethanol	64-17-5	44,353	44.35	957,560,656	2,651.81	0.3027		
furan, 2-propyl-	4229-91-8	8,600	8.60	957,560,656	514.18	0.0587		
decane, 2,6,8-trimethyl-	62108-26-3	12,000	12.00	957,560,656	717.46	0.0819		
pentane	109-66-0	33,962	33.96	957,560,656	2,030.52	0.2318		
nonane, 2-methyl-	871-83-0	180,396	180.40	957,560,656	10,785.64	1.2312		
isobutene		9,750	9.75	957,560,656	582.94	0.0665		
isopentane		69,000	69.00	957,560,656	4,125.42	0.4709		
3-methylhexane		7,500	7.50	957,560,656	448.42	0.0512		
n-propyl acetate		8,200	8.20	957,560,656	490.27	0.0560		
ethyl buryrate		11,800	11.80	957,560,656	705.51	0.0805		
p-isopropyltoluene		8,725	8.73	957,560,656	521.66	0.0595		

Existing	Total HAPS	3,953.66	lbs/yr
	Total HAPS	1.98	tons/yr
	Total H2S	4.00	tons/yr
Expansion	Total HAPS	8,711.91	lbs/yr
	Total HAPS	4.36	tons/yr
	Total H2S	8.82	tons/yr
Site-Wide	Total HAPS	12,665.57	lbs/yr
	Total HAPS	6.33	tons/yr
	Total H2S	12.83	tons/yr

Note:

1. Even though the data was all ND for these samples, these compounds were included at half the detection limit because the AGC levels for these compounds are lowest.
* = Concentrations obtained from the average of 3/20/97, 10/21/00, 8/30/01, 8/26/03, 8/26/04, 7/26/05, 8/3/06, 8/28/07, 10/2/08, 9/3/09, 8/31/10, 9/13/11, 9/6/12, 9/19/13, 10/21/14 & 6/24/15 sampling data

* original concentration was 301155.899187148 micrograms/cubic meter when concentration was 228.205 ppm. New concentration is 429101.892411605 micrograms/cubic meter when concentration was 308 ppm. For new calculations Benson Chen assumed 1 atm of pressure, temperature of 298.15 K, MW of 34.086, and a R constant of 0.08206 L*atm/mol*K.

Table 4

PTE of LFG Flare Emissions
Seneca Meadows Landfill

	Year	Flare	Total LFG Flared (cfm)	Flare Capacity (cfm)	Measured LFG to Flares (MMscf/yr) [3]	Adjusted LFG to Flares (MMscf/yr) [4]	Flare Emissions					
							NMOC (TPY)	CO (TPY)	NO_x (TPY)	SO_2 (TPY)	HCL (TPY)	PM (TPY)
Existing Landfill	2039	LE	4,000	4,000	2,102.40	2,102.40	2.52	31.54	13.14	52.92	1.58	3.26
	2039	LE	601	601	316.06	316.06	0.38	4.74	1.98	7.96	0.24	0.49
	TOTAL:		4,601	4,601	2,418.46	2,418.46	2.89	36.28	15.12	60.88	1.81	3.75
Expansion Landfill Scenario 1	2039	Enclosed	4,000	4,000	2,102.40	2,102.40	2.52	94.56	38.83	52.92	1.58	3.26
	2039	Enclosed	120.3	120.3	63.23	63.23	0.08	2.84	1.17	1.59	0.05	0.10
	TOTAL:		4,120	4,120	2,165.63	2,165.63	2.59	97.40	40.00	54.51	1.62	3.36
Expansion Landfill Scenario 2	2039	LE	4,000	4,000	2,102.40	2,102.40	2.52	31.54	13.14	52.92	1.58	3.26
	2039	LE	4,000	4,000	2,102.40	2,102.40	2.52	31.54	13.14	52.92	1.58	3.26
	2039	LE	2,000	2,000	1,051.20	1,051.20	1.26	15.77	6.57	26.46	0.79	1.63
	2039	LE	139	139	73.08	73.08	0.09	1.10	0.46	1.84	0.05	0.11
	TOTAL:		10,139	10,139	5,329.08	5,329.08	6.38	79.94	33.31	134.14	3.99	8.26

	Flare Emissions					
	NMOC (TPY)	CO (TPY)	NO_x (TPY)	SO_2 (TPY)	HCL (TPY)	PM (TPY)
Existing Landfill (2039)	2.89	36.28	15.12	60.88	1.81	3.75
Expansion Landfill Scenario 1 (2039)	2.59	97.40	40.00	54.51	1.62	3.36
Expansion Landfill Scenario 2 (2039)	6.38	79.94	33.31	134.14	3.99	8.26
Expansion Landfill Scenario 3 (2039)	6.38	97.40	40.00	134.14	3.99	8.26

	Emission Factors					
	LB/MMSCF					
	NMOC [1]	CO	NO_x	SO_2 [7]	HCL [2]	PM [6]
Enclosed Flare	2.39	89.95	36.94	50.34	1.499	3.10
LE Flare	2.39	30.00	12.50	50.34	1.499	3.10

Notes:

1) NMOC emission factor extrapolated from site-specific concentration of 535 ppm as hexane with 98 percent DRE

2) Emission factor was calculated based on actual chlorinated components of LFG from site-specific sampling (4/97) at enclosed flare

3) Amount of LFG was obtained from SMI and is for LF-1, LF-2, LF-4, and LF-5

4) Total LFG not adjusted to 50.1 percent methane (average site-specific methane concentration in 2016)

5) Enclosed flare emission factors calculated based on manufactures' information. Assumes 72 ppm CO and 18 ppm NOx in exhaust

6) Emission factor referenced from December 2006 *Application for Title V Permit Modification - Landfill Expansion*

7) SO_2 emission factor based on site-specific H_2S average concentration of 308 ppm

Table 5A

Combustion HAP Emissions
Seneca Meadows Landfill

Compound	CAS Number	Conc. µg/m³*	Conc. Mg/m³	FT³/YR	LB/YR		LB/Hr	HAPs	lb/yr HAPs
					Total	x 98% DRE			
Freon 12	75-71-8	7,200	7.20	4,584,086,937	2,060.81	41.2162	0.00470505		
Freon 114	76-14-2	436	0.44	4,584,086,937	124.65	2.4930	0.00028459		
vinyl chloride	75-01-4	2,100	2.10	4,584,086,937	601.07	12.0214	0.00137231	x	12.0
Freon 11	75-69-4	2,547	2.55	4,584,086,937	728.98	14.5795	0.00166433		
methylene chloride (dichloromethane)	75-09-2	4,155	4.16	4,584,086,937	1,189.26	23.7852	0.00271521	x	23.8
1,1-dichloroethane (ethylene dichloride)	75-34-3	1,147	1.15	4,584,086,937	328.26	6.5653	0.00074946	x	6.6
cis-1,2-dichloroethene	540-59-0	2,441	2.44	4,584,086,937	698.65	13.9731	0.00159510		
trichloroethene	79-01-6	2,174	2.17	4,584,086,937	622.18	12.4436	0.00142050	x	12.4
tetrachloroethene	127-18-4	5,188	5.19	4,584,086,937	1,484.79	29.6957	0.00338992	x	29.7
chlorobenzene	108-90-7	351	0.35	4,584,086,937	100.36	2.0071	0.00022913	x	2.0
1,4-dichlorobenzene	106-46-7	2,036	2.04	4,584,086,937	582.64	11.6529	0.00133024	x	11.7
1,2-dichlorobenzene	95-50-1	318	0.32	4,584,086,937	90.88	1.8175	0.00020748		
chloroethane (ethyl chloride)	75-00-3	510	0.51	4,584,086,937	145.88	2.9177	0.00033307	x	2.9
1,1,1- trichloroethane (methyl chloroform)	71-55-6	406	0.41	4,584,086,937	116.28	2.3256	0.00026548	x	2.3
benzene	71-43-2	5,269	5.27	4,584,086,937	1,508.04	30.1608	0.00344302	x	30.2
toluene	108-88-3	87,250	87.25	4,584,086,937	24,973.04	499.4607	0.05701607	x	499
ethyl benzene	100-41-4	19,425	19.43	4,584,086,937	5,559.90	111.1980	0.01269383	x	111
m,p-xylene	1330-20-7	38,750	38.75	4,584,086,937	11,091.18	221.8235	0.02532232	x	222
o-xylene	95-47-6	10,806	10.81	4,584,086,937	3,093.01	61.8601	0.00706166	x	62
styrene	100-42-5	2,335	2.34	4,584,086,937	668.46	13.3693	0.00152617	x	13.4
1,3,5-trimythylbenzene	108-67-8	2,069	2.07	4,584,086,937	592.20	11.8439	0.00135205		
1,2,4-trimethylbenzene	95-63-6	5,140	5.14	4,584,086,937	1,471.19	29.4238	0.00335888		
4 methyl-2-pentanone (methyl isobutyl ketone)	108-10-1	4,613	4.61	4,584,086,937	1,320.21	26.4042	0.00301417	x	26.4
4-ethyltoluene	622-96-8	3,395	3.40	4,584,086,937	971.73	19.4346	0.00221856		
heptane	142-82-5	8,370	8.37	4,584,086,937	2,395.69	47.9139	0.00546962		
chlorodifluoromethane	75-45-6	5,500	5.50	4,584,086,937	1,574.23	31.4846	0.00359414		
d-limonene	5989-27-5	26,960	26.96	4,584,086,937	7,716.60	154.3319	0.01761780		
alpha-pinene	80-56-8	30,740	30.74	4,584,086,937	8,798.52	175.9705	0.02008795		
cyclohexane	110-82-7	3,680	3.68	4,584,086,937	1,053.30	21.0661	0.00240480		
ethanol	64-17-5	103,936	103.94	4,584,086,937	29,749.07	594.9815	0.06792026		
tetrahydrofuran	109-99-9	8,560	8.56	4,584,086,937	2,450.08	49.0015	0.00559378		
hexane	110-54-3	5,770	5.77	4,584,086,937	1,651.51	33.0302	0.00377058	x	33.0
2-propanol	67-63-0	30,860	30.86	4,584,086,937	8,832.87	176.6574	0.02016637		
acetone	67-64-1	32,563	32.56	4,584,086,937	9,320.17	186.4033	0.02127892		
2-Butanone (methyl ethyl ketone)	78-93-3	60,000	60.00	4,584,086,937	17,173.43	343.4687	0.03920876		
Acrolein[1]	107-02-8	574	0.57	4,584,086,937	164.37	3.2875	0.00037528	x	3.3
Acrylonitrile[1]	107-13-1	370	0.37	4,584,086,937	105.90	2.1181	0.00024179	x	2.1
ethyl acetate	141-78-6	14,515	14.52	4,584,086,937	4,154.54	83.0908	0.00948525		
ethyl butyrate		43,000	43.00	4,584,086,937	12,307.63	246.1526	0.02809961		
ethyl valerate	539-82-2	7,600	7.60	4,584,086,937	2,175.30	43.5060	0.00496644		
1,2-dichloroethane	107-06-2	883	0.88	4,584,086,937	252.86	5.0572	0.00057731	x	5.1
1,1-dichloroethene	75-35-4	173	0.17	4,584,086,937	49.55	0.9911	0.00011313	x	1.0
1,2-dichloropropane	78-87-5	158	0.16	4,584,086,937	45.08	0.9016	0.00010292	x	0.9
trichlorotrifluoroethane	26523-64-8	194	0.19	4,584,086,937	55.63	1.1127	0.00012702		
trans-1,2-dichloroethene	156-60-5	163	0.16	4,584,086,937	46.51	0.9302	0.00010619		
methyl tert-butyl ether	1634-04-4	275	0.28	4,584,086,937	78.71	1.5742	0.00017971	x	1.6
2-hexanone	591-78-6	341	0.34	4,584,086,937	97.52	1.9504	0.00022265		
propylene	115-07-1	20,000	20.00	4,584,086,937	5,724.48	114.4896	0.01306959		
1,3-butadiene	106-99-0	156	0.16	4,584,086,937	44.54	0.8909	0.00010170	x	0.9
dichlorodifluoromethane									
1,2-Dichloro-1,1,2,2-tetrafluoroethane									
Acetonitrile	75-05-8	357	0.36	4,584,086,937	102.22	2.0445	0.00023339		
n-butyl acetate	123-86-4	3,413	3.41	4,584,086,937	976.74	19.5348	0.00223000		
n-octane	111-65-9	4,825	4.83	4,584,086,937	1,381.03	27.6206	0.00315304		
n-nonane	111-84-2	10,325	10.33	4,584,086,937	2,955.26	59.1052	0.00674717		
cumene	98-82-8	1,118	1.12	4,584,086,937	319.86	6.3971	0.00073026	x	6.4
n-propylbenzene	103-65-1	916	0.92	4,584,086,937	262.25	5.2451	0.00059875		
naphthalene	91-20-3	313	0.31	4,584,086,937	89.68	1.7937	0.00020476		

Table 5A

Combustion HAP Emissions
Seneca Meadows Landfill

Compound	CAS Number	Conc. µg/m³*	Conc. Mg/m³	FT³/YR	LB/YR		LB/Hr	HAPs	lb/yr HAPs
					Total	x 98% DRE			
hydrogen sulfide*	7783-06-46	429,102	429.10	4,584,086,937	122,819.22	2,456.3845	0.28040919		
carbonyl sulfide	463-58-1	1,771	1.77	4,584,086,937	506.94	10.1389	0.00115740	x	10.14
methyl mercaptan	74-93-1	6,026	6.03	4,584,086,937	1,724.80	34.4960	0.00393790		
dimethyl sulfide	75-18-3	10,929	10.93	4,584,086,937	3,128.04	62.5609	0.00714165		
carbon disulfide	75-15-0	1,117	1.12	4,584,086,937	319.81	6.3962	0.00073016	x	6.40
ethyl mercaptan	75-08-1	660	0.66	4,584,086,937	188.78	3.7755	0.00043100		
isopropyl mercaptan	75-33-2	12,858	12.86	4,584,086,937	3,680.16	73.6033	0.00840220		
tert-butyl mercaptan	75-66-1	998	1.00	4,584,086,937	285.55	5.7110	0.00065194		
ethyl methyl sulfide	624-89-5	547	0.55	4,584,086,937	156.43	3.1285	0.00035714		
thiophene	110-02-1	11,334	11.33	4,584,086,937	3,243.99	64.8799	0.00740638		
isobutyl mercaptan	513-44-0	1,348	1.35	4,584,086,937	385.89	7.7178	0.00088102		
2,5-dimethylthiophene	638-02-8	808	0.81	4,584,086,937	231.17	4.6233	0.00052778		
n-propyl mercaptan	107-03-9	461	0.46	4,584,086,937	131.87	2.6373	0.00030107		
dimethyl disulfide	624-92-0	300	0.30	4,584,086,937	85.87	1.7173	0.00019604		
3-methylthiophene	616-44-4	556	0.56	4,584,086,937	159.06	3.1812	0.00036315		
butanoic acid, ethyl ester	105-54-4	9,799	9.80	4,584,086,937	2,804.76	56.0952	0.00640356		
butane	106-97-8	25,345	25.35	4,584,086,937	7,254.37	145.0874	0.01656249		
butane, 2-methyl	78-78-4	76,589	76.59	4,584,086,937	21,921.51	438.4302	0.05004911		
2-propanol	67-63-0	46,085	46.09	4,584,086,937	13,190.68	263.8137	0.03011571		
2-butanol, (R)-	14898-79-4	50,393	50.39	4,584,086,937	14,423.62	288.4724	0.03293064		
1-butanol	71-36-3	19,578	19.58	4,584,086,937	5,603.75	112.0750	0.01279395		
alpha-pinene	80-56-8	96,326	96.33	4,584,086,937	27,570.86	551.4172	0.06294717		
decane	124-18-5	18,232	18.23	4,584,086,937	5,218.49	104.3698	0.01191436		
n-undecane		10,000	10.00	4,584,086,937	2,862.24	57.2448	0.00653479		
butanoic acid, 1-methylpropyl ester	819-97-6	28,955	28.96	4,584,086,937	8,287.67	165.7534	0.01892162		
limonene	138-86-3	39,885	39.89	4,584,086,937	11,416.07	228.3215	0.02606410		
Isopropanol		30,000	30.00	4,584,086,937	8,586.72	171.7343	0.01960438		
1-propanol		14,217	14.22	4,584,086,937	4,069.15	81.3830	0.00929030		
octane	111-65-9	20,000	20.00	4,584,086,937	5,724.48	114.4896	0.01306959		
propyl butyrate		14,900	14.90	4,584,086,937	4,264.74	85.2947	0.00973684		
n-nonane	111-84-2	30,000	30.00	4,584,086,937	8,586.72	171.7343	0.01960438		
1,2,4-trimethylbenzene		10,000	10.00	4,584,086,937	2,862.24	57.2448	0.00653479		
Propane		15,733	15.73	4,584,086,937	4,503.26	90.0651	0.01028141		
Isobutane		43,021	43.02	4,584,086,937	12,313.63	246.2726	0.02811331		
ethanol	64-17-5	44,353	44.35	4,584,086,937	12,694.88	253.8976	0.02898374		
furan, 2-propyl-	4229-91-8	8,600	8.60	4,584,086,937	2,461.53	49.2305	0.00561992		
decane, 2,6,8-trimethyl-	62108-26-3	12,000	12.00	4,584,086,937	3,434.69	68.6937	0.00784175		
pentane	109-66-0	33,962	33.96	4,584,086,937	9,720.62	194.4124	0.02219319		
nonane, 2-methyl-	871-83-0	180,396	180.40	4,584,086,937	51,633.62	1,032.6725	0.11788499		
isobutene		9,750	9.75	4,584,086,937	2,790.68	55.8137	0.00637142		
isopentane		69,000	69.00	4,584,086,937	19,749.45	394.9890	0.04509007		
3-methylhexane		7,500	7.50	4,584,086,937	2,146.68	42.9336	0.00490109		
n-propyl acetate		8,200	8.20	4,584,086,937	2,347.04	46.9407	0.00535853		
ethyl buryrate		11,800	11.80	4,584,086,937	3,377.44	67.5488	0.00771106		
p-isopropyltoluene		8,725	8.73	4,584,086,937	2,497.30	49.9461	0.00570161		

	otal VOCs (lb/yr)	6,368.86	Total HCl	3,625.27 lb/yr
	l VOCs (Ton/yr)	3.18	Total HAPS	4,225.90 lb/yr
Existing	Total H2S (TPY)	0.65		2.11 tons/yr
	otal VOCs (lb/yr)	5,703.05	Total HCl	3,246.28 lb/yr
	l VOCs (Ton/yr)	2.85	Total HAPS	3,784.12 lb/yr
Expansion	Total H2S (TPY)	0.58		1.89 tons/yr
	otal VOCs (lb/yr)	12,071.91	Total HCl	6,871.55 lb/yr
	al VOCs (Ton/yr)	6.04	Total HAPS	8,010.02 lb/yr
Site-Wide	Total H2S (TPY)	1.23		4.01 tons/yr

Note:

1. Even though the data was all ND for these samples, these compounds were included at half the detection limit because the AGC levels for these compounds are lowest.
* = Concentrations obtained from the average of 3/20/97, 10/21/00, 8/30/01, 8/26/03, 8/26/04, 7/26/05, 8/3/06, 8/28/07, 10/2/08, 9/3/09, 8/31/10, 9/13/11, 9/6/12, 9/19/13, 10/21/14 & 6/24/15 sampling data

* original concentration was 301155.899187148 micrograms/cubic meter when concentration was 228.205 ppm. New concentration is 97523.1573662739 micrograms/cubic meter when concentration was 70 ppm. For new calculations Benson Chen assumed 1 atm of pressure, temperature of 298.15 K, MW of 34.086, and a R constant of 0.08206 L*atm/mol*K.

Table 5B

Combustion HAP Emissions
Seneca Meadows Landfill

Compound	CAS Number	Conc. µg/m³*	Conc. Mg/m³	FT³/YR	LB/YR		LB/Hr	HAPs	lb/yr HAPs
					Total	x 98% DRE			
Freon 12	75-71-8	7,200	7.20	7,747,536,217	3,482.97	69.6593	0.00795198		
Freon 114	76-14-2	436	0.44	7,747,536,217	210.67	4.2134	0.00048098		
vinyl chloride	75-01-4	2,100	2.10	7,747,536,217	1,015.86	20.3173	0.00231933	x	20.3
Freon 11	75-69-4	2,547	2.55	7,747,536,217	1,232.04	24.6408	0.00281287		
methylene chloride (dichloromethane)	75-09-2	4,155	4.16	7,747,536,217	2,009.96	40.1992	0.00458895	x	40.2
1,1-dichloroethane (ethylene dichloride)	75-34-3	1,147	1.15	7,747,536,217	554.80	11.0959	0.00126666	x	11.1
cis-1,2-dichloroethene	540-59-0	2,441	2.44	7,747,536,217	1,180.79	23.6158	0.00269587		
trichloroethene	79-01-6	2,174	2.17	7,747,536,217	1,051.54	21.0308	0.00240078	x	21.0
tetrachloroethene	127-18-4	5,188	5.19	7,747,536,217	2,509.43	50.1886	0.00572929	x	50.2
chlorobenzene	108-90-7	351	0.35	7,747,536,217	169.61	3.3923	0.00038724	x	3.4
1,4-dichlorobenzene	106-46-7	2,036	2.04	7,747,536,217	984.72	19.6945	0.00224823	x	19.7
1,2-dichlorobenzene	95-50-1	318	0.32	7,747,536,217	153.59	3.0718	0.00035066		
chloroethane (ethyl chloride)	75-00-3	510	0.51	7,747,536,217	246.56	4.9312	0.00056292	x	4.9
1,1,1- trichloroethane (methyl chloroform)	71-55-6	406	0.41	7,747,536,217	196.52	3.9304	0.00044868	x	3.9
benzene	71-43-2	5,269	5.27	7,747,536,217	2,548.73	50.9747	0.00581902	x	51.0
toluene	108-88-3	87,250	87.25	7,747,536,217	42,206.77	844.1354	0.09636249	x	844
ethyl benzene	100-41-4	19,425	19.43	7,747,536,217	9,396.75	187.9350	0.02145377	x	188
m,p-xylene	1330-20-7	38,750	38.75	7,747,536,217	18,745.13	374.9025	0.04279709	x	375
o-xylene	95-47-6	10,806	10.81	7,747,536,217	5,227.47	104.5494	0.01193487	x	105
styrene	100-42-5	2,335	2.34	7,747,536,217	1,129.76	22.5953	0.00257937	x	22.6
1,3,5-trimythylbenzene	108-67-8	2,069	2.07	7,747,536,217	1,000.87	20.0174	0.00228509		
1,2,4-trimethylbenzene	95-63-6	5,140	5.14	7,747,536,217	2,486.45	49.7290	0.00567683		
4 methyl-2-pentanone (methyl isobutyl ketone)	108-10-1	4,613	4.61	7,747,536,217	2,231.27	44.6255	0.00509423	x	44.6
4-ethyltoluene	622-96-8	3,395	3.40	7,747,536,217	1,642.32	32.8463	0.00374958		
heptane	142-82-5	8,370	8.37	7,747,536,217	4,048.95	80.9790	0.00924417		
chlorodifluoromethane	75-45-6	5,500	5.50	7,747,536,217	2,660.60	53.2120	0.00607443		
d-limonene	5989-27-5	26,960	26.96	7,747,536,217	13,041.77	260.8354	0.02977573		
alpha-pinene	80-56-8	30,740	30.74	7,747,536,217	14,870.33	297.4066	0.03395052		
cyclohexane	110-82-7	3,680	3.68	7,747,536,217	1,780.18	35.6036	0.00406434		
ethanol	64-17-5	103,936	103.94	7,747,536,217	50,278.72	1,005.5744	0.11479160		
tetrahydrofuran	109-99-9	8,560	8.56	7,747,536,217	4,140.86	82.8172	0.00945402		
hexane	110-54-3	5,770	5.77	7,747,536,217	2,791.21	55.8242	0.00637263	x	55.8
2-propanol	67-63-0	30,860	30.86	7,747,536,217	14,928.38	298.5676	0.03408305		
acetone	67-64-1	32,563	32.56	7,747,536,217	15,751.95	315.0391	0.03596336		
2-Butanone (methyl ethyl ketone)	78-93-3	60,000	60.00	7,747,536,217	29,024.71	580.4943	0.06626647		
Acrolein[1]	107-02-8	574	0.57	7,747,536,217	277.81	5.5562	0.00063426	x	5.6
Acrylonitrile[1]	107-13-1	370	0.37	7,747,536,217	178.99	3.5797	0.00040864	x	3.6
ethyl acetate	141-78-6	14,515	14.52	7,747,536,217	7,021.56	140.4312	0.01603096		
ethyl butyrate		43,000	43.00	7,747,536,217	20,801.04	416.0209	0.04749097		
ethyl valerate	539-82-2	7,600	7.60	7,747,536,217	3,676.46	73.5293	0.00839375		
1,2-dichloroethane	107-06-2	883	0.88	7,747,536,217	427.36	8.5472	0.00097570	x	8.5
1,1-dichloroethene	75-35-4	173	0.17	7,747,536,217	83.75	1.6750	0.00019121	x	1.7
1,2-dichloropropane	78-87-5	158	0.16	7,747,536,217	76.19	1.5238	0.00017395	x	1.5
trichlorotrifluoroethane	26523-64-8	194	0.19	7,747,536,217	94.03	1.8806	0.00021468		
trans-1,2-dichloroethene	156-60-5	163	0.16	7,747,536,217	78.61	1.5722	0.00017947		
methyl tert-butyl ether	1634-04-4	275	0.28	7,747,536,217	133.03	2.6606	0.00030372	x	2.7
2-hexanone	591-78-6	341	0.34	7,747,536,217	164.82	3.2964	0.00037630		
propylene	115-07-1	20,000	20.00	7,747,536,217	9,674.90	193.4981	0.02208882		
1,3-butadiene	106-99-0	156	0.16	7,747,536,217	75.28	1.5057	0.00017188	x	1.5
dichlorodifluoromethane									
1,2-Dichloro-1,1,2,2-tetrafluoroethane									
Acetonitrile	75-05-8	357	0.36	7,747,536,217	172.77	3.4553	0.00039444		
n-butyl acetate	123-86-4	3,413	3.41	7,747,536,217	1,650.78	33.0156	0.00376891		
n-octane	111-65-9	4,825	4.83	7,747,536,217	2,334.07	46.6814	0.00532893		
n-nonane	111-84-2	10,325	10.33	7,747,536,217	4,994.67	99.8934	0.01140335		
cumene	98-82-8	1,118	1.12	7,747,536,217	540.59	10.8117	0.00123421	x	10.8
n-propylbenzene	103-65-1	916	0.92	7,747,536,217	443.23	8.8646	0.00101194		
naphthalene	91-20-3	313	0.31	7,747,536,217	151.57	3.0315	0.00034606		

Table 5B

Combustion HAP Emissions
Seneca Meadows Landfill

Compound	CAS Number	Conc. µg/m³*	Conc. Mg/m³	FT³/YR	LB/YR		LB/Hr	HAPs	lb/yr HAPs
					Total	x 98% DRE			
hydrogen sulfide*	7783-06-46	429,102	429.10	7,747,536,217	207,575.99	4,151.5198	0.47391778		
carbonyl sulfide	463-58-1	1,771	1.77	7,747,536,217	856.78	17.1356	0.00195612	x	17.14
methyl mercaptan	74-93-1	6,026	6.03	7,747,536,217	2,915.07	58.3014	0.00665541		
dimethyl sulfide	75-18-3	10,929	10.93	7,747,536,217	5,286.69	105.7337	0.01207006		
carbon disulfide	75-15-0	1,117	1.12	7,747,536,217	540.51	10.8101	0.00123404	x	10.81
ethyl mercaptan	75-08-1	660	0.66	7,747,536,217	319.05	6.3810	0.00072842		
isopropyl mercaptan	75-33-2	12,858	12.86	7,747,536,217	6,219.82	124.3964	0.01420050		
tert-butyl mercaptan	75-66-1	998	1.00	7,747,536,217	482.61	9.6521	0.00110184		
ethyl methyl sulfide	624-89-5	547	0.55	7,747,536,217	264.38	5.2875	0.00060360		
thiophene	110-02-1	11,334	11.33	7,747,536,217	5,482.65	109.6530	0.01251747		
isobutyl mercaptan	513-44-0	1,348	1.35	7,747,536,217	652.19	13.0437	0.00148901		
2,5-dimethylthiophene	638-02-8	808	0.81	7,747,536,217	390.69	7.8139	0.00089200		
n-propyl mercaptan	107-03-9	461	0.46	7,747,536,217	222.87	4.4574	0.00050883		
dimethyl disulfide	624-92-0	300	0.30	7,747,536,217	145.12	2.9025	0.00033133		
3-methylthiophene	616-44-4	556	0.56	7,747,536,217	268.82	5.3765	0.00061375		
butanoic acid, ethyl ester	105-54-4	9,799	9.80	7,747,536,217	4,740.31	94.8062	0.01082262		
butane	106-97-8	25,345	25.35	7,747,536,217	12,260.57	245.2113	0.02799216		
butane, 2-methyl	78-78-4	76,589	76.59	7,747,536,217	37,049.40	740.9881	0.08458768		
2-propanol	67-63-0	46,085	46.09	7,747,536,217	22,293.49	445.8698	0.05089838		
2-butanol, (R)-	14898-79-4	50,393	50.39	7,747,536,217	24,377.27	487.5454	0.05565586		
1-butanol	71-36-3	19,578	19.58	7,747,536,217	9,470.87	189.4173	0.02162298		
alpha-pinene	80-56-8	96,326	96.33	7,747,536,217	46,597.34	931.9467	0.10638661		
decane	124-18-5	18,232	18.23	7,747,536,217	8,819.74	176.3948	0.02013639		
n-undecane		10,000	10.00	7,747,536,217	4,837.45	96.7490	0.01104441		
butanoic acid, 1-methylpropyl ester	819-97-6	28,955	28.96	7,747,536,217	14,006.94	280.1387	0.03197931		
limonene	138-86-3	39,885	39.89	7,747,536,217	19,294.24	385.8847	0.04405077		
Isopropanol		30,000	30.00	7,747,536,217	14,512.36	290.2471	0.03313323		
1-propanol		14,217	14.22	7,747,536,217	6,877.24	137.5449	0.01570147		
octane	111-65-9	20,000	20.00	7,747,536,217	9,674.90	193.4981	0.02208882		
propyl butyrate		14,900	14.90	7,747,536,217	7,207.80	144.1561	0.01645617		
n-nonane	111-84-2	30,000	30.00	7,747,536,217	14,512.36	290.2471	0.03313323		
1,2,4-trimethylbenzene		10,000	10.00	7,747,536,217	4,837.45	96.7490	0.01104441		
Propane		15,733	15.73	7,747,536,217	7,610.92	152.2185	0.01737654		
Isobutane		43,021	43.02	7,747,536,217	20,811.18	416.2237	0.04751412		
ethanol	64-17-5	44,353	44.35	7,747,536,217	21,455.53	429.1107	0.04898524		
furan, 2-propyl-	4229-91-8	8,600	8.60	7,747,536,217	4,160.21	83.2042	0.00949819		
decane, 2,6,8-trimethyl-	62108-26-3	12,000	12.00	7,747,536,217	5,804.94	116.0989	0.01325329		
pentane	109-66-0	33,962	33.96	7,747,536,217	16,428.76	328.5751	0.03750858		
nonane, 2-methyl-	871-83-0	180,396	180.40	7,747,536,217	87,265.66	1,745.3132	0.19923667		
isobutene		9,750	9.75	7,747,536,217	4,716.52	94.3303	0.01076830		
isopentane		69,000	69.00	7,747,536,217	33,378.42	667.5684	0.07620644		
3-methylhexane		7,500	7.50	7,747,536,217	3,628.09	72.5618	0.00828331		
n-propyl acetate		8,200	8.20	7,747,536,217	3,966.71	79.3342	0.00905642		
ethyl buryrate		11,800	11.80	7,747,536,217	5,708.19	114.1639	0.01303241		
p-isopropyltoluene		8,725	8.73	7,747,536,217	4,220.68	84.4135	0.00963625		

	otal VOCs (lb/yr)	6,368.86	Total HCl	3,625.27 lb/yr
	l VOCs (Ton/yr)	3.18	Total HAPS	4,225.90 lb/yr
Existing	Total H2S (TPY)	0.65		2.11 tons/yr
	otal VOCs (lb/yr)	14,033.80	Total HCl	7,988.29 lb/yr
	l VOCs (Ton/yr)	7.02	Total HAPS	9,311.78 lb/yr
Expansion	Total H2S (TPY)	1.43		4.66 tons/yr
	otal VOCs (lb/yr)	20,402.65	Total HCl	11,613.56 lb/yr
	al VOCs (Ton/yr)	10.20	Total HAPS	13,537.68 lb/yr
Site-Wide	Total H2S (TPY)	2.08		6.77 tons/yr

Note:

1. Even though the data was all ND for these samples, these compounds were included at half the detection limit because the AGC levels for these compounds are lowest.
* = Concentrations obtained from the average of 3/20/97, 10/21/00, 8/30/01, 8/26/03, 8/26/04, 7/26/05, 8/3/06, 8/28/07, 10/2/08, 9/3/09, 8/31/10, 9/13/11, 9/6/12, 9/19/13, 10/21/14 & 6/24/15 sampling data

* original concentration was 301155.899187148 micrograms/cubic meter when concentration was 228.205 ppm. New concentration is 97523.1573662739 micrograms/cubic meter when concentration was 70 ppm. For new calculations Benson Chen assumed 1 atm of pressure, temperature of 298.15 K, MW of 34.086, and a R constant of 0.08206 L*atm/mol*K.

Table 6A

Summary of Flare GHG Emissions
Seneca Meadows Landfill

2039
Site-wide LFG to Flares = 4,584 MMscf

		Estimated Emissions (TPY)							
	MMscf Combusted	**Oxidation CO_2**	**Oxidation CH_4**	**Oxidation N_2O**	**Escape CH_4**	**Collected CO_2**	**Biogenic CO_2**	**Anthropogenic GHG**	**Total GHG**
Enclosed Flares	4,584	131,555.9	8.1	1.6	484.8	132,938.5	264,494.4	12,795.6	277,290.0
Existing	Total Emissions (TPY)	69,405.8	4.3	0.8	255.8	70,135.3	139,541.1	6,750.7	146,291.7
Expansion	Total Emissions (TPY)	62,150.1	3.8	0.8	229.0	62,803.3	124,953.3	6,045.0	130,998.3
	Total Emissions (TPY)	131,555.9	8.1	1.6	484.8	132,938.5	264,494.4	12,795.6	277,290.0
Site-Wide	Total Emissions (lb/yr)	263,111,742	16,170	3,183	969,534	265,877,042	528,988,785	25,591,260	

Flare Combustion Factors

	Pounds per MMScf		
	CO_2	**CH_4**	**N_2O**
Enclosed Flare	57,396.8	3.5	0.69

Notes:

Oxidation CO_2	Combustion emission factor referenced from Table C-1 of 40 CFR Part 98, Subpart C
Oxidation CH_4	Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Oxidation N_2O	Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Escape CH_4	Methane that is not destructed within the flare (=1% of total for 99% DE)
Collected CO_2	Portion of collected LFG that already contains CO_2

Heating value	500	Btu/scf
LFG CH_4 Concentration	50	%
CH_4 Destruction Efficiency	99	% (default value from 40 CFR 98, Subpart HH)
CH_4 Density	0.0423	pounds per cubic foot (referenced from 40 CFR Part 98, Subpart HH)
CO_2 concentration	50	% (= 100% - CH_4%)
CO_2 density	0.116	pounds per cubic foot

Emission Factor Development

Enclosed Flares - CH_4 Oxidation Emission Factors

	EF (kg/MMBtu)	GWP (100 year)
CO_2	52.07	1
CH_4	3.20E-03	25
N_2O	6.30E-04	298

Table 6B

Summary of Flare GHG Emissions
Seneca Meadows Landfill

2039
Site-wide LFG to Flares = 7,748 MMscf

		Estimated Emissions (TPY)							
	MMscf Combusted	**Oxidation CO_2**	**Oxidation CH_4**	**Oxidation N_2O**	**Escape CH_4**	**Collected CO_2**	**Biogenic CO_2**	**Anthropogenic GHG**	**Total GHG**
LE Flares	7,748	222,341.7	13.7	2.7	819.3	224,678.6	447,020.3	21,625.8	468,646.1
Existing	Total Emissions (TPY)	69,405.8	4.3	0.8	255.8	70,135.3	139,541.1	6,750.7	146,291.7
Expansion	Total Emissions (TPY)	152,935.9	9.4	1.9	563.6	154,543.3	307,479.2	14,875.1	322,354.4
	Total Emissions (TPY)	222,341.7	13.7	2.7	819.3	224,678.6	447,020.3	21,625.8	468,646.1
Site-Wide	Total Emissions (lb/yr)	444,683,485	27,328	5,380	1,638,604	449,357,101	894,040,585	43,251,627	

Flare Combustion Factors

	Pounds per MMScf		
	CO_2	**CH_4**	**N_2O**
LE Flare	57,396.8	3.5	0.69

Notes:

Oxidation CO_2	Combustion emission factor referenced from Table C-1 of 40 CFR Part 98, Subpart C
Oxidation CH_4	Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Oxidation N_2O	Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Escape CH_4	Methane that is not destructed within the flare (=1% of total for 99% DE)
Collected CO_2	Portion of collected LFG that already contains CO_2

Heating value	500	Btu/scf
LFG CH_4 Concentration	50	%
CH_4 Destruction Efficiency	99	% (default value from 40 CFR 98, Subpart HH)
CH_4 Density	0.0423	pounds per cubic foot (referenced from 40 CFR Part 98, Subpart HH)
CO_2 concentration	50	% (= 100% - CH_4%)
CO_2 density	0.116	pounds per cubic foot

Emission Factor Development

Enclosed Flares - CH_4 Oxidation Emission Factors

	EF (kg/MMBtu)	GWP (100 year)
CO_2	52.07	1
CH_4	3.20E-03	25
N_2O	6.30E-04	298