

GAS ANALYSIS REPORT
 by ATLANTIC ANALYTICAL LABORATORY (AAL, Whitehouse, NJ)
 ACRION'S CO₂ WASH PROCESS DEMONSTRATION UNIT
 NJ ECOCOMPLEX / BURLINGTON COUNTY LANDFILL / September 2001

	Raw Landfill Gas AAL 6061-1		Methane Product AAL 6061-3	
<i>Non-Condensable Gases</i>	vol%	DL vol%	vol%	DL vol%
Nitrogen	6.7	0.01	9.6	0.01
Oxygen	--	0.10	--	0.10
Hydrogen	--	0.10	--	0.10
Carbon Dioxide	35.0	0.01	25.7	0.01
<i>Volatile Hydrocarbons</i>	ppm volume	DL ppm	ppm volume	DL ppm
Methane	(49.6%)	1	(62.6%)	1
Ethylene	3	1	3	1
Acetylene	nd	10	nd	10
Ethane	2	1	2	1
Propylene	nd	1	nd	1
Propane	41	1	14	1
Isobutane	13	1	nd	1
n-Butane	8	1	nd	1
Butenes	nd	1	nd	1
Isopentane	2	1	nd	1
n-Pentane	2	1	nd	1
Hexanes +	200	1	nd	1
<i>Volatile Sulfur Compounds</i>	ppm volume	DL ppm	ppm volume	DL ppm
Hydrogen Sulfide	nd		nd	0.05
Carbonyl Sulfide	1.10		0.1	0.05
Sulfur Dioxide	nd		nd	0.05
Methyl Mercaptan	nd		nd	0.05
Ethyl Mercaptan	nd		nd	0.05
Dimethyl Sulfide	4.00		nd	0.05
Carbon Disulfide	0.46		nd	0.05
Isopropyl Mercaptan	nd		nd	0.05
Methyl Ethyl Sulfide	0.06		nd	0.05
n-Propyl Mercaptan	nd		nd	0.05
t-Butyl Mercaptan	0.26		nd	0.05
Dimethyl Disulfide	1.00		nd	0.05
sec-Butyl Mercaptan	0.16		nd	0.05
Isobutyl Mercaptan	0.26		nd	0.05
Diethyl Sulfide	nd		nd	0.05
n-Butyl Mercaptan	0.12		nd	0.05

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<i>GC/MS Results</i> <i>TO-14 Target List</i>	Raw Landfill Gas AAL 6061-1		Methane Product AAL 6061-3	
	ppm volume	DL ppm	ppm volume	DL ppm
Freon-12	2.8		nd	0.5
Methyl Chloride	nd	0.5	nd	0.5
Freon-114	0.5		nd	0.5
Vinyl Chloride	0.5		nd	0.5
Methyl Bromide	nd	0.5	nd	0.5
Ethyl Chloride	nd	0.5	nd	0.5
Freon-11	nd	0.5	nd	0.5
Vinylidene Chloride	nd	0.5	nd	0.5
Freon-113	nd	0.5	nd	0.5
Dechloromethane	nd	0.5	nd	0.5
1,1-Dichlorethane	nd	0.5	nd	0.5
cis-1,2-Dichloroethylene	1.2		nd	0.5
Chloroform	nd	0.5	nd	0.5
1,1,1-Trichloroethane	nd	0.5	nd	0.5
1,2-Dichlorethane	nd	0.5	nd	0.5
Benzene	0.8		nd	0.2
Carbon Tetrachloride	nd	0.5	nd	0.5
1,2-Dichloropropane	5.1		nd	0.5
Trichloroethylene	0.7		nd	0.2
cis-1,3-Dichloropropylene	nd	0.5	nd	0.5
trans-1,3-Dichloropropylene	nd	0.5	nd	0.5
Toluene	38.0		nd	0.2
1,1,2-Trichloroethane	nd	0.2	nd	0.2
1,2-Dibromoethane	nd	0.5	nd	0.5
Tetrachloroethylene	1.5		nd	0.2
Chlorobenzene	nd	0.2	nd	0.2
Ethyl Benzene	14.0		nd	0.2
m+p-Xylenes	15.0		nd	0.2
Styrene	4.4		nd	0.2
o-Xylene	4.2		nd	0.2
1,1,2,2-Tetrachloroethane	nd	0.2	nd	0.2
4-Ethyltoluene	6.2		nd	0.2
1,3,5-Trimethylbenzene	1.2		nd	0.2
1,2,4-Trimethylbenzene	1.2		nd	0.2
1,3-Dichlorobenzene	nd	0.2	nd	0.2
1,4-Dichlorobenzene	nd	0.2	nd	0.2
Benzylchloride	nd	0.2	nd	0.2
1,2-Dichlorobenzene	nd	0.2	nd	0.2
1,2,4-Trichlorobenzene	nd	0.2	nd	0.2
Hexachlorobutadiene	nd	0.2	nd	0.2

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<i>GC/MS Results</i> <i>Non-TO-14 Target List</i>	Raw Landfill Gas AAL 6061-1		Methane Product AAL 6061-3	
	ppm volume	DL ppm	ppm volume	DL ppm
Propane	41		14	
Isobutane	13		nd	0.5
Acetone	21		nd	0.5
Methylethyl Ketone	40		nd	0.5
2-butanol	38		nd	0.5
C6H12O2	28		nd	0.5
C9 Aliphatic Hydrocarbon	32		nd	0.5
Alpha-Pinene	38		nd	0.5
C11 Aliphatic Hydrocarbon	16		nd	0.5
D-Limonene	15		nd	0.5
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<i>GC/MS Results</i> <i>Toxic Substances Sub-17</i>	ppb volume	DL ppb	ppb volume	DL ppb
Freon-12			nd	10
Vinyl Chloride		Compounds detected with other test methods Analysis at ppb level not performed.	nd	10
Chloroform			nd	10
1,2-Dichloroethane			nd	10
Benzene			nd	10
Carbon Tetrachloride			nd	10
Trichloroethylene			nd	10
1,4-Dioxane			nd	10
1,1,2-Trichloroethane			nd	10
1,2-Dibromoethane			nd	10
Tetrachloroethylene			nd	10
1,1,2,2 Tetrachloroethane			nd	10
Methylene Chloride			nd	10
1,1,1-Trichloroethane			nd	10

NOTES:

AAL 6061-1: raw landfill gas after compression to 400 psig and water knockout

AAL-6061-3: product gas from CO2 wash

DL = Detection Limit, if not shown, reported result is greater than DL

nd = concentration is less than stated DL

-- = test not performed

ppm = parts per million

ppb = parts per billion