APPENDIX A

FIGURES

Figure 1. Holtsville Area Map

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SLK 9/24/04

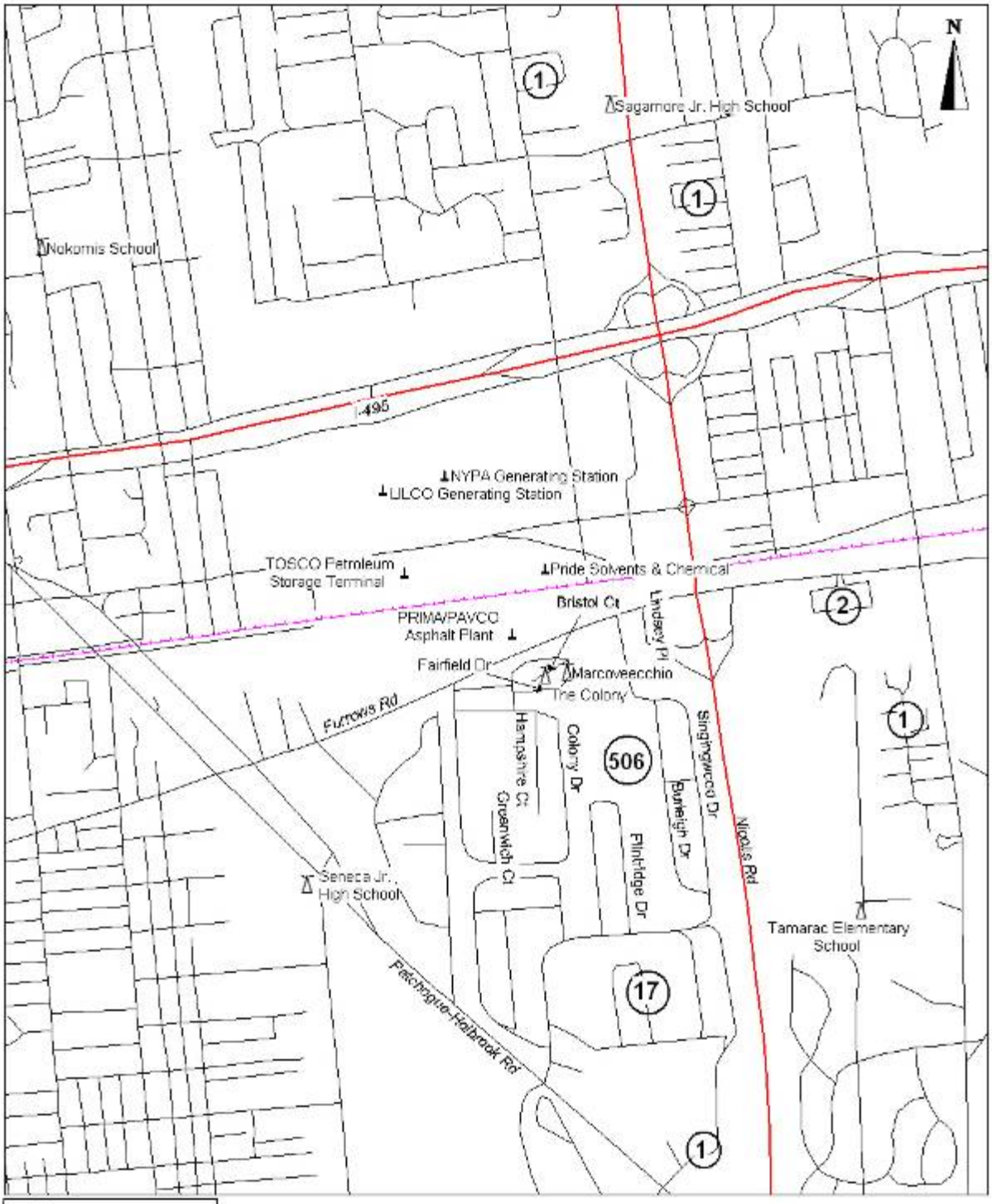

Figure 2. Number of Odor Complaints
Per Street or Neighborhood, 1997 - 2003

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APPENDIX B

TABLES

Table 1. Farmingville Air Monitoring Stations

Site No.	**Air Monitoring Station** ***(Dates Of Operation)***	**Distance From Center Of Study Area**	**Comments**
#2A	Tamarac Elementary School 50 Spence Avenue Holtsville, NY 11742 (12/96-present)	1.4 Miles, S.E.	Satellite Station VOCs
#3A	Seneca Jr. H.S. 850 Main Street Holbrook, NY 11741 (12/96-present)	1.1 Miles, S.W.	Satellite Station VOCs
#4A	Nokomis School 151 Holbrook Road Ronkonkoma, NY 11779 (12/96-4/00)	1.0 Miles, N.W.	Satellite Station VOCs
#5A	Sagamore Jr. H.S. 57 Division Street Holtsville, NY 11742 (12/96 – present)	1.0 Miles, N.E.	Main Station CAM, Meteorology & VOCs
#6A	Adjacent To: Marcovecchio Residence 201 Fairfield Dr. East Holbrook, NY 11742 (1/98-present)	0.7 Miles, S.	Local Pt. Source Station VOCs, Particulates
# 8A or #9A	The Colony Adjacent to: Dr. Marino 326 Bristol Court Holbrook NY 11741	0.8 mi S.	Local Point Source Station VOCs, aldehydes, silica, particulates, asbestos

Table 2. 2000 Demographics for the Holtsville, Farmingville, Holbrook, and Lake Ronkonkoma Area, Suffolk County, NY

2000 Census Demographics	New York State excluding NYC	Suffolk County	Communities of Holtsville, Farmingville, Holbrook, and Lake Ronkonkoma
Age Distribution[1]			
<6	8%	9%	9%
6-19	20%	20%	20%
20-64	58%	60%	63%
>64	14%	12%	8%
Race Distribution[1]			
White	85%	85%	94%
Black	8%	7%	1%
Native American	<1%	<1%	<1%
Asian	2%	2%	2%
Pacific Islander	<1%	0%	0%
Other	2%	4%	1%
Multi-Racial	2%	2%	1%
Percent Minority*	18%	21%	11%
Ethnicity Distribution[1]			
Percent Hispanic	6%	11%	7%
1999 Median Income[2]	$47,517	$65,288	$67,230
% Below Poverty Level[2]	10%	6%	4%

* Minority includes Hispanics, African-Americans, Asian-Americans, Pacific Islanders and Native Americans.

1. US Bureau of the Census. *2000 Census of population and housing summary file 1(SF1).* US Department of Commerce. 2001.

2. US Bureau of the Census. *2000 Census of population and housing summary file 3 (SF3).* US Department of Commerce. 2001.

Table 3. Summary of VOC air monitoring data – 24-hour, every sixth day samples detection frequency (%), and range of chemical concentrations, at or above detection limits in parts per billion volume (ppb(v)). Shaded rows indicate chemicals that were detected in 50% or more of samples in each of the seven years.

Chemical	1997 April-December		1998		1999		2000		2001		2002		2003 January-June	
	%	Range	%	Range	%	Range	%	Range	%	Range	%	Range	%	Range
1,1,1-Trichloroethane	**97**	(0.01-0.26)	**91**	(0.03-0.1)	**81**	(0.04-0.08)	**100**	(0.02-0.09)	**98**	(0.03-0.12)	**89**	(0.02-0.06)	**83**	(0.03-0.10)
1,1,2,2-Tetrachloroethane	**3**	0.22												
1,1-Dichloroethylene	**12**	(0.03-0.14)			**12**	0.03	**7**	0.02						
1,1-Dichloroethane	**3**	0.15												
1,2,3-Trichloropropane	**3**	0.21												
1,2,4-Trimethylbenzene	**94**	(0.03-0.32)	**87**	(0.003-0.3)	**94**	(0.04-0.23)	**70**	(0.03-0.24)	**98**	(0.03-0.26)	**91**	(0.02-0.36)	**73**	(0.02-0.18)
1,2-Dibromoethane	**3**	0.05												
1,2-Dichloroethane	**3**	0.08												
1,2-Dichloropropane	**3**	0.19												
1,2-Epoxybutane									**2**	0.19				
1,3,5-Trimethylbenzene	**66**	(0.03-0.11)	**61**	(0.02-0.09)	**19**	(0.03-0.06)	**50**	(0.02-0.04)	**46**	(0.02-0.19)	**38**	(0.02-0.11)	**27**	(0.02-0.06)
1,3-Butadiene	**6**	(0.15-0.17)	**9**	(1.82-2.02)			**13**	(0.09-0.15)	**15**	(0.09-0.34)	**13**	(0.10-0.19)		
2,2,4-Trimethylpentane	**88**	(0.03-0.88)	**74**	(0.03-0.3)	**88**	(0.03-0.48)	**93**	(0.03-0.27)	**89**	(0.02-0.30)	**79**	(0.02-0.37)	**77**	(0.02-0.13)
2-Butanone(MEK)	**59**	(0.03-1.1)	**90**	(0.03-0.23)	**88**	(0.06-0.34)	**77**	(0.02-0.35)	**91**	(0.02-0.26)	**89**	(0.02-0.50)	**97**	(0.04-0.54)
2-Propenal	**6**	(0.09-0.1)	**9**	(0.07-0.08)	**62**	(0.05-0.18)	**33**	(0.04-0.19)	**41**	(0.05-0.21)	**4**	(0.06-0.23)		
2-Propenenitrile	**9**	(0.04-0.06)												
3-Chloro-1-propene							**3**	0.16			**2**	0.02		
α-Chlorotoluene			**4**	0.05										
Acetonitrile	**9**	(0.07-0.16)	**35**	(0.03-0.1)	**19**	(0.04-0.06)	**10**	(0.06-0.26)			**2**	0.10		
Benzene	**100**	(0.05-0.79)	**100**	(0.09-0.93)	**100**	(0.03-0.63)	**100**	(0.06-0.54)	**100**	(0.08-0.77)	**96**	(0.06-0.82)	**97**	(0.05-0.39)
Bromomethane					**6**	0.11							**10**	(0.08-0.10)
Butanal	**6**	(0.04-0.47)	**35**	(0.02-0.06)	**62**	(0.02-0.6)	**53**	(0.02-0.17)	**37**	(0.02-0.13)	**70**	(0.02-0.19)	**63**	(0.02-0.06)
Butane											**82**	(0.08-11.80)	**87**	(0.58-11.00)
Carbon disulfide					**6**	0.03	**13**	(0.02-0.05)	**4**	(0.02-0.14)	**14**	(0.02-0.07)	**23**	(0.02-0.06)
Carbon tetrachloride	**88**	(0.02-0.25)	**87**	(0.03-0.12)	**94**	(0.06-0.15)	**97**	(0.02-0.17)	**100**	(0.04-0.15)	**91**	(0.04-0.20)	**87**	(0.02-0.19)
Chorobenzene	**6**	(0.08-0.19)												
Chloroethane									**2**	0.38				
Chloroform	**9**	(0.03-0.17)	**9**	(0.02-0.03)	**44**	(0.03-0.12)	**37**	(0.02-0.12)	**46**	(0.02-0.07)	**23**	(0.02-0.05)	**40**	(0.02-0.49)
Chloromethane					**12**	(0.14-0.23)	**3**	0.08	**4**	0.11				
cis-1,2-Dichloroethylene	**3**	0.03												
Cyclohexane													**37**	(0.03-0.08)
Decanal	**31**	(0.05-0.98)	**91**	(0.03-1.1)			**33**	(0.05-1.50)	**28**	(0.05-0.69)	**11**	(0.05-0.26)	**23**	(0.03 -0.13)
Epichlorohydrin													**7**	0.04

Table 3 (continued)

Chemical	1997 April-December		1998		1999		2000		2001		2002		2003 January-June	
	%	Range	%	Range	%	Range	%	Range	%	Range	%	Range	%	Range
Ethyl acrylate							3	0.05	2	0.03				
Ethylbenzene	72	(0.04-0.26)	91	(0.02-0.21)	94	(0.04-0.16)	87	(0.02-0.13)	96	(0.02-0.20)	95	(0.02-0.44)	93	(0.02-0.12)
Ethylene oxide							3	0.10			4	(0.05-0.09)		
Freon 11	94	(0.09-0.43)	100	(0.17-0.43)	62	(0.2-0.4)	97	(0.05-0.62)	96	(0.19-0.46)	89	(0.16-0.46)	93	(0.04-0.37)
Freon 113	96	(0.03-0.31)	96	(0.04-0.1)	100	(0.04-0.12)	100	(0.03-0.15)	96	(0.02-0.11)	89	(0.05-0.12)	90	(0.05-0.09)
Freon 114	53	(0.07-0.88)			75	(0.04-0.18)	23	(0.02-0.03)	13	(0.02-0.03)	5	(0.02-0.03)		
Freon 12	100	(0.16-0.92)	100	(0.03-0.52)	100	(0.08-0.48)	90	(0.02-0.65)	91	(0.07-0.43)	86	0.02-0.62)	93	(0.05-0.35)
Hexanal	38	(0.03-0.27)	26	(0.03-0.09)	38	(0.03-0.09)	17	(0.02-0.17)	15	(0.02-0.15)	4	(0.04-0.04)		
Hexane			74	(0.07-0.32)	38	(0.1-0.16)	63	(0.07-0.42)	83	(0.06-0.51)	71	0.05-0.47)	90	(0.07-0.76)
Iodomethane	6	0.03	9	(0.08-0.1)	6	0.06								
Isopropyl benzene									4	0.02	2	0.02		
Methanol			17	(0.39-3.63)	6	0.93	17	(0.13-0.52)	30	(0.08-0.67)	2	0.21		
Methyl methacrylate	6	(0.09-0.19)												
Methyl isobutyl ketone	3	0.06	4	0.08			3	0.05	9	(0.04-0.08)	4	(0.04-0.05)		
Methylene chloride	72	(0.03-0.14)	74	(0.03-0.14)	56	(0.03-0.12)	70	(0.02-0.17)	78	(0.03-0.20)	88	(0.02-0.27)	70	(0.02-0.12)
MTBE	94	(0.08-2.4)	96	(0.1-1.47)	100	(0.03-0.83)	100	(0.03-0.97)	100	(0.07-0.10)	89	(0.05-1.74)	93	(0.02-0.59)
m-Xylene	96	(0.04-0.74)	100	(0.03-0.51)	100	(0.04-0.42)	97	(0.04-0.44)	100	(0.04-0.68)	98	(0.03-0.85)	97	(0.05-0.41)
Naphthalene	84	(0.03-0.31)	78	(0.02-0.27)	88	(0.03-0.13)	67	(0.02-0.08)	70	(0.02-0.09)	63	(0.02-0.17)	43	(0.02-0.05)
Nitrobenzene	3	0.14												
Nonanal	53	(0.03-2.5)	90	(0.02-0.79)	25	(0.03-0.05)	27	(0.03-0.79)	30	(0.03-0.46)	4	(0.05-0.06)	7	0.03
Octanal	12	(0.05-0.28)	35	(0.03-0.14)	44	(0.03-0.11)	20	(0.02-0.32)	24	(0.03-0.13)	18	(0.02-0.09)		
o-Xylene	91	(0.02-0.33)	96	(0.03-0.25)	75	(0.03-0.2)	93	(0.03-0.19)	98	(0.01-0.27)	96	(0.02-0.36)	93	(0.02-0.16)
p-Dichlorobenzene	9	(0.03-0.05)	9	(0.03-0.04)	19	(0.02-0.06)	37	(0.02-0 .06)	20	(0.02-0.05)	23	(0.02-0.06)	17	(0.02-0.03)
p-Diethylbenzene	59	(0.02-0.12)	43	(0.02-0.08)	19	(0.03-0.04)	33	(0.01-0.03)	28	(0.02-0.05)	23	(0.02-0.08)	17	0.02
Pentanal	19	(0.03-0.3)	65	(0.02-0.24)	38	(0.02-0.12)	33	(0.02-0.18)	17	(0.02-0.11)	21	(0.02-0.07)	27	(0.02-0.03)
Phenol									35	(0.05-0.26)	66	0.02-0.20)	73	(0.02-0.10)
Propane											71	(0.04-2.58)	93	(0.10-2.75)
Propionitrile													33	(0.39-2.68)
Styrene	22	(0.03-0.07)	22	(0.02-0.05)	44	(0.03-0.05)	37	(0.02-0.04)	39	(0.02-0.07)	25	(0.02-0.07)	20	(0.02-0.04)
Tetrachloroethylene	72	(0.03-0.2)	83	(0.02-0.09)	81	(0.03-0.1)	73	(0.02-0.14)	67	(0.02-0.16)	64	(0.02-0.13)	53	(0.02-0.06)
Toluene	100	(0.07-1.6)	100	(0.08-0.23)	100	(0.07-0.76)	97	(0.010-1.10)	100	(0.09-1.50)	98	(0.07-1.44)	100	(0.03-0.74)
Trichloroethene	12	(0.02-0.16)	4	0.03	25	(0.03-0.08)	13	(0.02-0.06)	13	(0.02-0.05)	11	(0.02-0.04)		
annual sampling events	32		23		16		30		46		56		30	

Table 4. Summary of 24-hour, every sixth day VOC air monitoring data – multi-year average1 of annual 24-hour detected concentrations for 1997-2003 with standard deviation (SD) and NYS DEC average background concentrations. All concentrations are in parts per billion (ppb).

	1997-2003 Annual Average (SD)	NYS DEC Background[2] Average
1,1,1-Trichloroethane	0.057 (0.019)	0.136
1,2-Dichloroethane	0.08	0.019
Benzene	0.30(0.040)	0.447
Carbon Tetrachloride	0.094 (0.01)	0.103
Chlorobenzene	0.135	0.024
Chloroform	0.042 (0.02)	0.104
Ethyl Benzene	0.083 (0.02)	0.191
Methylene Chloride	0.072 (0.01)	0.580
m-Xylene	0.224 (0.04)	0.042
o-Xylene	0.101 (0.02)	0.222
p-Dichlorobenzene	0.034 (0.01)	0.079
Tetrachloroethene	0.054 (0.014)	0.298
Toluene	0.464 (0.095)	0.966
Trichloroethene	0.036 (0.01)	0.066

1 Two chemicals, 1,2-Dichloroethane and Chlorobenzene, were detected in only a single monitoring year. Although DEC multi-year background averages are available for these chemicals, the presence of detectable concentrations of these chemicals in only one year of the study indicates single year average would not represent likely exposure over several years.

2 DEC background concentration samples collected 1999- 2000 (averages for benzene and tetrachloroethene include sample results through 9/2002) NYS DOH obtained data for 18 air toxics from NYSDEC in 2003. Results reported as "non-detect" were changed to ½ the detection limit. Any monitor associated with a specific site or industrial source was omitted from the analysis.

Table 5. Summary of one-hour, complaint triggered sampling results. Number of dates on which the chemical was detected and range for detected concentrations, by calendar year. Shaded rows indicate compounds that were found in 25% or more of samples across all sampling events from 1997- 2003 (141 total sampling events). All values in parts per billion (ppb).

	1997		1998		1999		2000	
	Detects	Range	Detects	Range	Detects	Range	Detects	Range
	18 Samples		16 Samples		31 Samples		32 Samples	
1,1,1-Trichloroethane			2	0.1 - 0.9	1	0.4	2	0.2
1,1-Dichloroethylene			1	0.2			4	0.2 - 0.4
1,2,4-Trimethylbenzene	3	0.3 - 1.1	8	0.1 - 2.8	25	0.2 - 1.3	12	0.3 - 0.5
1,3,5-Trimethylbenzene	3	0.3 - 0.5	4	0.03 - 0.7	4	0.1 - 0.4		
1,3-Butadiene			1	2.6			1	0.2
1,4-Dioxane							1	2.6
2,2,4-Trimethylpentane	4	0.2 - 0.7	5	0.06 - 1.8			6	0.16 - 0.3
2-Butanone (MEK)	2	0.2 - 1.3	15	0.2 - 11.2	20	0.2 - 12.1	20	0.2 - 7.4
2-Nitropropane			1	1.1				
2-Propenal (acrolein)			8	0.5 - 2.1	7	0.3 - 2	4	0.7 – 9
2-Propenenitrile (acrylonitrile)			1	0.9	1	0.2		
3-Chloro-1-Propene (allylchloride)			1	0.04				
Acetaldehyde					7	1.1 - 7.6	4	1 – 3
Acetonitrile			10	0.2 - 2	1	1	1	0.3
a-Chlorotoluene (benzyl chloride)			1	0.5				
Benzaldehyde					8	0.8 - 12.5	1	1.1
Benzene	15	0.2 - 2.5	16	0.3 - 5	29	0.2 - 4.4	23	0.3 - 3.9
Bromomethane (methyl bromide)			4	1.1 - 16.6			1	3
Butanal (butyraldehyde)			6	0.3 - 4.1	5	0.2 - 0.4	10	0.04 - 4.3
Butane								
Carbon Disulfide			1	>107	6	0.3 - 1.1	8	0.3 - 3.1
Carbon Tetrachloride			1	0.1	3	0.1 - 0.3	1	0.1
Chlorobenzene	2	0.4 - 0.6					1	0.4
Chloroethane							1	1.3
Chloroform			5	0.02 - 0.9	4	0.2 - 2.1	6	0.3 - 4.2
Chloromethane			1	3.9	2	0.46 - 1	1	1
cis-1,2-Dichloroethylene					1	0.7		
Cyclohexane								
Decanal	6	0.4 - 2.9	14	0.4 - >36.5	13	0.3 - 4.7	24	0.6 - >25
Dichloroethylether	1	5.7						
Epichlorohydrin								
Ethyl Acrylate					1	0.3		
Ethyl Benzene	2	0.3 - 0.7	8	0.06 - 1.9	16	0.2 - 1	12	0.2 - 0.7

Table 5 (continued) all values in ppb.

	1997		1998		1999		2000	
	Detects	Range	Detects	Range	Detects	Range	Detects	Range
	18 Samples		16 Samples		31 Samples		32 Samples	
Ethylene Oxide								
Formaldehyde					19	3.0 - 18.2	30	1 – 26
FREON 11	3	0.7 - 3.3	5	0.3 - 0.6	15	0.3 - 6.4	14	0.2 – 2
FREON 113	8	0.3 - 3.2	11	0.1 - 1.7	9	0.1 - 0.3	6	0.1 - 0.4
FREON 12	18	0.3 - 1.9	14	0.4 - 3.3	31	0.2 - 2.2	28	0.1 - 1.8
Hexanal	2	0.6 - 1.7	10	0.4 - 6.8	12	0.3 - 0.9	12	0.2 - 1.3
Hexane	4	0.7 - 1.3	3	0.1 - 2.6	15	0.3 - 7.1	17	0.4 - 8.6
Iodomethane			4	0.2 - 6.8				
Isopropyl Benzene			1	0.2				
Methanol			9	0.5 - >1291	16	0.6 - >96	10	0.24 - >138
Methyl Isobutyl Ketone (MIBK)							1	0.05
Methyl Methacrylate			2	0.6 - >133	2	0.6 - >21	4	0.6 - >130
Methyl tert Butyl Ether (MTBE)	14	0.3 - 4.9	15	0.4 - 11.6	24	0.2 - 1.9	20	0.4 - 1.6
Methylene Chloride			10	0.1 - 1.5	19	0.2 - 5.7	12	0.15 - 4.3
m-Xylene	9	0.6 - 2.5	14	0.2 - 4.2	29	0.2 - 1.5	25	0.4 - 1.5
Naphthalene	1	0.3	5	0.1 - 0.7	13	0.2 - 0.5	2	0.05 - 0.1
Nonanal	7	0.3 - 8.4	15	0.3 - >19	18	0.1 - 20.3	20	0.4 - 6.8
Octanal	5	0.4 - 2.9	4	0.4 - 4.6	13	0.3 - 2.7	13	0.6 - 2.2
o-Xylene	4	0.2 - 1.1	11	0.1 - 2.6	21	0.2 - 1.1	16	0.2 - 0.7
p-Dichlorobenzene			2	0.3 - 0.4			1	0.01
p-Diethylbenzene	2	0.3	2	0.03 - 0.7	1	0.2	1	0.03
Pentanal	1	1	10	0.3 - 3.3	4	0.3 - 0.7	13	0.2 - 1.5
Phenol								
Propanal							3	2.0 - 2.8
Propane								
Propionitrile								
Styrene	1	0.3	7	0.02 - 0.6	4	0.2 - 0.7	3	0.05 - 0.2
Tetrachloroethene	2	0.3 - 1.9	3	0.1 - 1.7	5	0.4 - 1	9	0.1 - 1.1
Toluene	10	0.2 - 5.6	16	0.3 - 9.2	30	0.3 - 1.8	25	0.3 - 3.2
Trichloroethene			2	0.04 - 0.2	3	0.6	1	0.03

Table 5 (continued)

	2001		2002		2003		Background
	Detects	Range	Detects	Range	Detects	Range	
	27 Samples		16 Samples		5 Samples		DOH 1996, 2003
1,1,1-Trichloroethane	1	0.3			1	0.4	<0.05 - 0.07
1,1-Dichloroethylene	1	0.2					<0.06
1,2,4-Trimethylbenzene	8	0.1 - 0.7	4	0.6 - 1.1	1	2.7	<0.05 - 0.2
1,3,5-Trimethylbenzene	1	0.2	1	0.2	1	0.7	<0.05 - 0.09
1,3-Butadiene	1	2.4					NA
1,4-Dioxane							NA
2,2,4-Trimethylpentane	1	0.2					NA
2-Butanone (MEK)	13	0.6 - 3.7	11	0.6 - 2.6	3	0.3 - 2.1	0.1 - 0.8
2-Nitropropane							NA
2-Propenal (acrolein)	12	0.5 - 2	1	0.5			NA
2-Propenenitrile (acrylonitrile)							NA
3-Chloro-1-Propene (allylchloride)							NA
Acetaldehyde	9	8 - 26	2	1.1 - 6			NA
Acetonitrile							<0.06 - 0.16
a-Chlorotoluene (benzyl chloride)							NA
Benzaldehyde	2	1 - 2					NA
Benzene	24	0.3 - 7.9	14	0.3 - 1.9	2	0.3 - 0.5	0.08 - 0.8
Bromomethane (methyl bromide)							<0.06
Butanal (butyraldehyde)	1	0.3	3	0.2 - 0.3			NA
Butane	1	4.3	9	0.7 - 8.9	5	0.8 - 46	NA
Carbon Disulfide	9	0.3 - 11			1	0.4	NA
Carbon Tetrachloride	1	0.1	2	0.3 - 0.5			<0.04 - 0.11
Chlorobenzene							<0.05
Chloroethane			3	0.3 - 2.6			<0.09
Chloroform	4	0.3 - 1.3	1	0.8	1	0.5	<0.05 - 0.05
Chloromethane	2	1.3 - 25					<0.1 - 1
cis-1,2-Dichloroethylene							<0.06
Cyclohexane					5	0.9 - 9.3	<0.07 - 0.2
Decanal	20	0.5 - 12.3	11	0.9 - 10.8	2	0.7 - 1.3	NA
Dichloroethylether							NA
Epichlorohydrin	1	0.3					NA
Ethyl Acrylate							NA
Ethyl Benzene	7	0.2 - 0.4	3	0.2 - 0.9			<0.06 - 0.14
Ethylene Oxide			1	0.5			NA
Formaldehyde	27	1 - 73	16	2 - 57	4	1.0 - 16	NA
FREON 11	13	0.3 - 0.9	3	0.2 - 0.7	2	0.6	<0.04 - 0.5

Table 5 (continued)

	2001		2002		2003		Background
	Detects	Range	Detects	Range		Range	
	27 Samples		16 Samples		5 Samples		DOH 1996, 2003
FREON 113	5	0.3 - 3.2					<0.03 - 0.1
FREON 12	25	0.4 - 0.8	11	0.2 - 0.6	3	0.3 - 0.8	<0.05 - 1.0
Hexanal	5	0.6 - 1.6	3	0.1 - 0.3			NA
Hexane	23	0.4 - 19	11	0.9 – 7.8	3	2.3 - 53	<0.07 - 0.31
Iodomethane	2	2.2					NA
Isopropyl Benzene							<0.05
Methanol	13	0.8 - 12					NA
Methyl Isobutyl Ketone (MIBK)	9	0.3 - 5.7	2	0.5 - 1.5			<0.06 - 0.08
Methyl Methacrylate	1	1.2					<0.06
Methyl tert Butyl Ether (MTBE)	20	0.2 - 4.12	10	0.3 - 2.4	4	0.4 - 1.9	<0.07 - 0.33
Methylene Chloride	16	0.3 - 28.6	8	0.3 - 0.6	2	0.3 - 0.4	<0.07
m-Xylene	19	0.2 - 1	12	0.2 - 3.3	4	0.3 - 0.6	<0.06 - 0.16
Naphthalene			3	0.3			<0.5
Nonanal	13	0.4 - 4.4	9	0.4 - 1.3	1	0.4	NA
Octanal	11	0.3 - 1.3	9	0.3 - 1			NA
o-Xylene	9	0.2 - 0.4	4	0.3 - 2.4	1	0.3	<0.06 - 0.17
p-Dichlorobenzene							<0.3
p-Diethylbenzene			1	0.3			NA
Pentanal	4	0.4 - 1.1	5	0.2 - 0.4	1	0.4	NA
Phenol	6	0.3 - 13	6	0.3 - 2.1	1	0.7	NA
Propanal	2	3					NA
Propane	1	1.7	12	0.7 - 9.8	5	0.8 - 3.1	NA
Propionitrile					5	6.0 - 25.3	NA
Styrene							<0.06
Tetrachloroethene	4	0.5	2	0.1			<0.04 - 0.05
Toluene	23	0.3 - 2.1	13	0.4 - 7.4	4	1	0.2 - 0.9
Trichloroethene	1	0.2					<0.05

Table 6. One-hour sampling results for VOCs. Frequency with which a chemical was detected in each year of sampling (1997-2003), the highest air concentration measured in any year and odor threshold and odor characteristic, if available for the compounds detected. Shaded rows indicate compounds that were found in 25% or more of samples across all sampling events from 1997- 2003 (141 total sampling events).

Chemical	Detection Frequency (% of samples) by year							Max Value (ppb)	Odor Threshold (ppb)	Source	Odor description
	1997	1998	1999	2000	2001	2002	2003				
1,1,1-Trichloroethane		13	3	6	4			0.9	>120000	EPA[1]	sweet, like chloroform
1,1-Dichloroethylene				13	4			0.4	120000	EPA	ether-like
1,2,4-Trimethylbenzene	17	50	81	38	30	25	20	2.8	2400	AIHA [2]	Aromatic
1,3,5-Trimethylbenzene	17	25	13		4	6 20	20	0.7	2200	AIHA	
1,3-Butadiene	6			3	4			2.6	1600	EPA	Gasoline
1,4-Dioxane				3				2.6	24000	EPA	faint, pleasant
2,2,4-Trimethylpentane	22	31		19	4			1.8	16000	AIHA	gasoline-like
2-Butanone (MEK)	16 6	94	65	63	48	69	60	12	5400	EPA	acetone-like
2-Nitropropane								1.1	70	EPA	mild
2-Propenal (acrolein)		50	23	13	44	6		9	200	EPA	disagreeable
2-Propenenitrile (acrylonitrile)		6	3					0.9	1600	AIHA	
3-Chloro-1-Propene (allylchloride)	6							0.04	1200	EPA	pungent, onion, garlic
Acetaldehyde				13	33	13		26	50	EPA	fruity, pleasant
Acetonitrile	6	63	3	3				2	170000	EPA	sweet, ether-like
a-Chlorotoluene (benzyl chloride)		23						0.5	44	EPA	pungent
Benzaldehyde				3	7			12.5			
Benzene	83	100	94	72	89	88	40	7.9	1500	EPA	sweet
Bromomethane (methyl bromide)	6	26		3				16.6	20500	EPA	practically odorless
Butanal (butyraldehyde)		38	16	31	4	19		4.3			
Butane	25				4	56	100	46	none	AIHA	
Carbon Disulfide			23	25	33		20	**>107**	50	EPA	chloroform-like to rotten eggs
Carbon Tetrachloride		6	10	3	4	13		0.5	252000	AIHA	sweet, like chloroform
Chlorobenzene	11			3				0.6	220 -1700	EPA	aromatic, almond-like
Chloroethane	6			3		19		2.6	4200	EPA	ether-like
Chloroform		31	13	19	15	6	20	4.2	85000	EPA	pleasant, non-irritating
Chloromethane		6	6	3	7			25	10000	EPA	faint, sweet
cis-1,2-Dichloroethylene			3					0.7			
Cyclohexane							100	9.3	780000	AIHA	sweet, chloroform or benzene-like
Decanal	33	88	42	75	74	69	40	>36.5			orange, rose citrus odor
Dichloroethylether	6							5.7			
Epichlorohydrin					4			0.3	930	EPA	pungent, garlicky, sweet

Table 6 (continued)

Chemical	Detection Frequency (% of samples) by year							Max Value (ppb)	Odor Threshold (ppb)	Source	Odor description
	1997	1998	1999	2000	2001	2002	2003				
Ethyl Acrylate			3					**0.3**	0.24	AIHA	Sharp acrid
Ethyl Benzene	11	50	52	38	26	19		1.9	none	AIHA	pungent, sweet, gasoline-like
Ethylene Oxide						6		0.5	257000	AIHA	
Formaldehyde			61	94	100	100	80	73	830	EPA	pungent, suffocating
FREON 11	17	31	48	44	48	19	40	6.4	50-500	CAOEHHA [3]	faint ether-like
FREON 113	44	69	29	19	19			3.2	45000	CAOEHHA	
FREON 12	100	88	100	88	93	69	60	3.3	odorless		
Hexanal	11	63	39	38	19	19		6.8		HSDB [4]	fruity, green grass
Hexane	22	19	48	53	85	69	60	53	13000	EPA	faint, peculiar
Iodomethane		25			7			6.8	none	EPA	pungent
Isopropyl Benzene								0.2	32	AIHA	
Methanol		56	52	31	48			>1291	4200	AIHA	pungent alcoholic
Methyl Isobutyl Ketone (MIBK)				3	33	13		5.7	100	AIHA	camphor
Methyl Methacrylate	6	13	6	13	4			**>133**	49	AIHA	
Methyl tert Butyl Ether (MTBE)	78	94	77	63	74	63	80	11.6		HSDB	terpene-like
Methylene Chloride		63	61	38	59	50	40	28.6	144000	EPA2 [5]	sweet, chloroform-like
m-Xylene	50	88	94	78	70	75	80	4.2	730	EPA2	sweet, benzene-like
Naphthalene	6	31	42	6		19		0.7	38	AIHA	tar, creosote, moth balls
Nonanal	39	94	58	63	48	56	20	>19			
Octanal	28	38	42	41	41	56		4.6		HSDB	fruity
o-Xylene	22	69	68	50	33	25	20	2.6	5400	AIHA	sweet, aromatic
p-Dichlorobenzene		13		3				0.4	120	AIHA	mothballs
p-Diethylbenzene	11	13	3	3		6		0.7			
Pentanal	6	63	13	41	15	31	20	3.3	none	AIHA	acrid pungent
Phenol					22	38	20	13	40	EPA	very sweet
Propanal				9	7			3	1000	EPA	suffocating, fruity
Propane					4	75	100	9.8	none	AIHA	odorless
Propionitrile							100	25.3			
Styrene	6	44	13	9				0.7	140	AIHA	
Tetrachloroethene	11	25	16	28	19	13		1.9	1000	EPA	sharp, sweet
Toluene	56	100	97	78	85	81	80	9.2	2800	EPA2	sour, burnt, benzene-like
Trichloroethene		13	10	3	4			0.6	28000	EPA	sweet, ether or chloroform-like

[1] EPA Air Toxics Website http://www.epa.gov/ttn/atw/hlthef.

[2] AIHA, Odor Thresholds for Chemicals with Established Occupational Health Standards.1989. American Industrial Hygiene Association.

[3] CAOEHHA, Office of Environmental Health Hazard Assessment, (2003) Technical Support Document: Toxicology Clandestine Drug Labs/ Methamphetamine. Volume 1, Number 1. California Environmental Protection Agency; Sacramento,CA. Retrieved via www.oehha.ca.gov.

[4] HSDB, Hazardous Substance Data Bank accessed via internet at http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB.

[5] EPA2, Reference Guide to Odor Thresholds for Hazardous Air Pollutants Listed in the Clean Air Act Amendments of 1990. March 1992. USEPA/ORD/EPA/600/R-92/047.

Table 7. Wind Direction (direction wind comes from)

	NE	SE	SW	NW	Variable	No data
General						
Regional 1997-2002	20%	12%	30%	30%	8%	0%
24 hour VOC sampling 1997-2003	6%	14%	14%	25%	40%	1%
Complaint related						
At time of complaint 1997-2003	30%	1%	4%	45%	15%	5%
Complaint sampling 1997-2003	32%	2%	3%	49%	9%	5%
1997-2000	36%	1%	4%	37%	16%	7%
2001-2003	28%	4%	1%	64%	0%	2%

Table 8. Summary of information from odor complaint logs

Year	Number of complaints logged	Number of residences from which complaints were received	Number of odor complaint days	Number of sampling events	Number of Health Complaints	Type of odors reported
1997 (9 months)	20	8	17	18	4	Asphalt, petroleum, tar
1998	20	11	16	16	1	Asphalt, burning (tar, rubber)
1999	43	9	31	31	6	Asphalt, fuels, burning, chemical
2000	89	29	30	32	4	Asphalt, tar, fuels, burning, chemicals, sulfur, garbage
2001	216	29	112	27	6	Asphalt, tar, burning, fuel, sewage, moldy
2002	141	19	85	16	13	Asphalt, chemicals, burning, fuels
2003 (6 months)	12	6	12	3	1	Asphalt, tar, oil, chemicals

Table 9. Public Health Assessment Comparison Values for Ambient Air Contaminants Holtsville, Farmingville, Holbrook, and Lake Ronkonkoma Communities (all concentrations in parts per billion)

Contaminant	Frequency of Detection 1-Hour Samples	Range During 1- Hour Samples	Comparison Value Short-term Exposure
			Non-Cancer[1]
2-Propenal	22 %	n.d[3]. - 9	0.05
Formaldehyde	68 %	n.d. - 73	40
Benzene	87 %	n.d. - 7.9	50

Contaminant	Frequency of Detection in 24-Hour Samples	Annual Average of 24-Hour Samples[2]	Comparison Values Long-term Exposure	
			Non-Cancer	Cancer
2-Propenal	22 %	0.05	0.009[4]	
Formaldehyde	-	Not available	24.4[5]	0.05[5]
Benzene	100 %	0.30	9.4[4]	0.04 – 0.14[6]

1 Agency for Toxic Substance and Disease Registry Acute Minimal Risk Level accessed via http://www.atsdr.cdc.gov/mrls.html
2 Average across all 24-hour sampling events, results of non-detectable assigned a value of one half the detection limit to calculate the annual average
3 n.d. = chemical was not detected
4 U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS) reference concentration accessed via http://www.epa.gov/iriswebp/iris/index.html
5 NYS Department of Health 1990. Ambient Air Criteria Document: Formaldehyde
6 Calculated using EPA IRIS cancer potency factor range for benzene

APPENDIX C

NYS DOH PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS FOR CONTAMINANTS OF CONCERN

NYS DOH PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS FOR CONTAMINANTS OF CONCERN

To evaluate the potential health risks from contaminants of concern associated with the Holtsville Air Monitoring site, the NYS DOH assessed the risks for cancer and noncancer health effects.

Increased cancer risks were estimated by using site-specific information on exposure levels for the contaminant of concern and interpreting them using cancer potency estimates derived for that contaminant by the US EPA or, in some cases, by the NYS DOH. The following qualitative ranking of cancer risk estimates, developed by the NYS DOH, was then used to rank the risk from very low to very high. For example, if the qualitative descriptor was "low," then the excess lifetime cancer risk from that exposure is in the range of greater than one per million to less than one per ten thousand. Other qualitative descriptors are listed below:

Excess Lifetime Cancer Risk

Risk Ratio	Qualitative Descriptor
equal to or less than one per million	very low
greater than one per million to less than one per ten thousand	low
one per ten thousand to less than one per thousand	moderate
one per thousand to less than one per ten	high
equal to or greater than one per ten	very high

An estimated increased excess lifetime cancer risk is not a specific estimate of expected cancers. Rather, it is a plausible upper bound estimate of the probability that a person may develop cancer sometime in his or her lifetime following exposure to that contaminant.

There is insufficient knowledge of cancer mechanisms to decide if there exists a level of exposure to a cancer-causing agent below which there is no risk of getting cancer, namely, a threshold level. Therefore, every exposure, no matter how low, to a cancer-causing compound is assumed to be associated with some increased risk. As the dose of a carcinogen decreases, the chance of developing cancer decreases, but each exposure is accompanied by some increased risk.

There is general consensus among the scientific and regulatory communities on what level of estimated excess cancer risk is acceptable. An increased lifetime cancer risk of one in one million or less is generally not considered a significant public health concern.

For noncarcinogenic health risks, the contaminant intake was estimated using exposure assumptions for the site conditions. This dose was then compared to a risk reference dose (estimated daily intake of a chemical that is likely to be without an appreciable risk of health effects) developed by the US EPA, ATSDR and/or NYS DOH. The resulting ratio was then compared to the following qualitative scale of health risk:

Qualitative Descriptions for
Noncarcinogenic Health Risks

Ratio of Estimated Contaminant Intake to Risk Reference Dose	Qualitative Descriptor
equal to or less than the risk reference dose	minimal
greater than one to five times the risk reference dose	low
greater than five to ten times the risk reference dose	moderate
greater than ten times the risk reference dose	high

Noncarcinogenic effects unlike carcinogenic effects are believed to have a threshold, that is, a dose below which adverse effects will not occur. As a result, the current practice is to identify, usually from animal toxicology experiments, a no-observed-effect-level (NOEL). This is the experimental exposure level in animals at which no adverse toxic effect is observed. The NOEL is then divided by an uncertainty factor to yield the risk reference dose. The uncertainty factor is a number which reflects the degree of uncertainty that exists when experimental animal data are extrapolated to the general human population. The magnitude of the uncertainty factor takes into consideration various factors such as sensitive subpopulations (for example, children or the elderly), extrapolation from animals to humans, and the incompleteness of available data. Thus, the risk reference dose is not expected to cause health effects because it is selected to be much lower than dosages that do not cause adverse health effects in laboratory animals.

The measure used to describe the potential for noncancer health effects to occur in an individual is expressed as a ratio of estimated contaminant intake to the risk reference dose. A ratio equal to or less than one is generally not considered a significant public health concern. If exposure to the contaminant exceeds the risk reference dose, there may be concern for potential noncancer health effects because the margin of protection is less than that afforded by the reference dose. As a rule, the greater the ratio of the estimated contaminant intake to the risk reference dose, the greater the level of concern. This level of concern depends upon an evaluation of a number of factors such as the actual potential for exposure, background exposure, and the strength of the toxicologic data.

APPENDIX D

PUBLIC HEALTH HAZARD CATEGORIES

INTERIM PUBLIC HEALTH HAZARD CATEGORIES

Category / Definition	Data Sufficiency	Criteria
A. Urgent Public Health Hazard This category is used for sites where short-term exposures (< 1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.	This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that site-specific conditions or likely exposures have had, are having, or are likely to have in the future, an adverse impact on human health that requires immediate action or intervention. Such site-specific conditions or exposures may include the presence of serious physical or safety hazards.
B. Public Health Hazard This category is used for sites that pose a public health hazard due to the existence of long-term exposures (> 1 yr) to hazardous substance or conditions that could result in adverse health effects.	This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants (including radionuclides) have had, are having, or are likely to have in the future, an adverse impact on human health that requires one or more public health interventions. Such site-specific exposures may include the presence of serious physical or safety hazards.
C. Indeterminate Public Health Hazard This category is used for sites in which "*critical*" data are *insufficient* with regard to extent of exposure and/or toxicologic properties at estimated exposure levels.	This determination represents a professional judgement that critical data are missing and ATSDR has judged the data are insufficient to support a decision. This does not necessarily imply all data are incomplete; but that some additional data are required to support a decision.	The health assessor must determine, using professional judgement, the "criticality" of such data and the likelihood that the data can be obtained and will be obtained in a timely manner. Where some data are available, even limited data, the health assessor is encouraged to the extent possible to select other hazard categories and to support their decision with clear narrative that explains the limits of the data and the rationale for the decision.
D. No Apparent Public Health Hazard This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.	This determination represents a professional judgement based on critical data which ATSDR considers sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that, under site-specific conditions of exposure, exposures to site-specific contaminants in the past, present, or future are not likely to result in any adverse impact on human health.
E: No Public Health Hazard This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.	Sufficient evidence indicates that no human exposures to contaminated media have occurred, none are now occurring, and none are likely to occur in the future.	

∗ *Such as environmental and demographic data; health outcome data; exposure data; community health concerns information; toxicologic, medical, and epidemiologic data; monitoring and management plans.*

APPENDIX E

RESPONSE TO PUBLIC COMMENTS

RESPONSE TO PUBLIC COMMENTS

This response to public comments was prepared to answer area residents' questions on the draft Holtsville, Farmingville, Holbrrok and Lake Ronkonkoma Communities Health Consultation. The public was invited to comment during the public comment period which ran from August 8th, 2005 September 5th, 2005. If you have any questions, please contact the New York State Department of Health (NYS DOH) at the toll-free number 1-800-458-1158 extension 27850.

Comment #1: Citizen states that odors are limited to summer months when prevailing winds are from the south west, and that there are three types of odors that occur at different times of day. Citizen states that the report implies that local communities experience exposures to chemical contaminants but no action against a source is taken.

Response #1: The authors and investigators of the report attempt to characterize the nature and extent of measured chemical concentrations and continuous air monitoring data in relation to the frequency and location of odor complaints and meteorological data. Unfortunately, relating the data to a specific source or even a source location is difficult. For example, one-half mile northeast of the large industrial area, there are a number of both large and small industries that can intermittently affect local air quality and identifying a specific source is difficult. While the levels of several compounds were above the long-term health comparison value, they are similar to levels found in other parts of New York and are consistent with levels seen in urban areas generally.

Comment #2: The commenter suggests that other environmental impacts are occurring beyond the scope of this study, for example, visible dust clouds. In addition the commenter believes that since the majority of citizen odor and/or particulate complaints are directly related to the Prima Asphalt Plant, a separate statement (and/or report) concerning the Prima Asphalt Corporation is justified. The statement (and/or report) should include a literature search which identifies Asphalt Plant emissions and provide recommendations for the placement of pollution controls, if warranted. Such a report and/or statement would require interagency cooperation.

Response #2: Since 1997, data collected in response to odor complaints as well as those collected to characterize the ambient air are substantial. However, as indicated in the health consultation, the data have limitations that make it difficult to determine an impact from a specific source, such as Prima Asphalt. Determining the source of odors can be especially difficult because we often do not know which chemical(s) is causing the odors and contaminants are quickly diluted as they disperse from the source and additional data will probably not remove the limitations. If SCDHS or NYS DEC chooses to conduct additional targeted air monitoring to characterize air emissions related to Prima Asphalt or other local source, NYS DOH is willing to assist in planning and data interpretation if requested.