164688

MACTEC

SEPTEMBER 2002
GROUND-WATER MONITORING REPORT

SWOPE OIL SUPERFUND SITE
PENNSAUKEN, NEW JERSEY

Prepared for:

Swope Oil Superfund Site Consent Decree Signatories

Pennsauken, New Jersey

January 29, 2003

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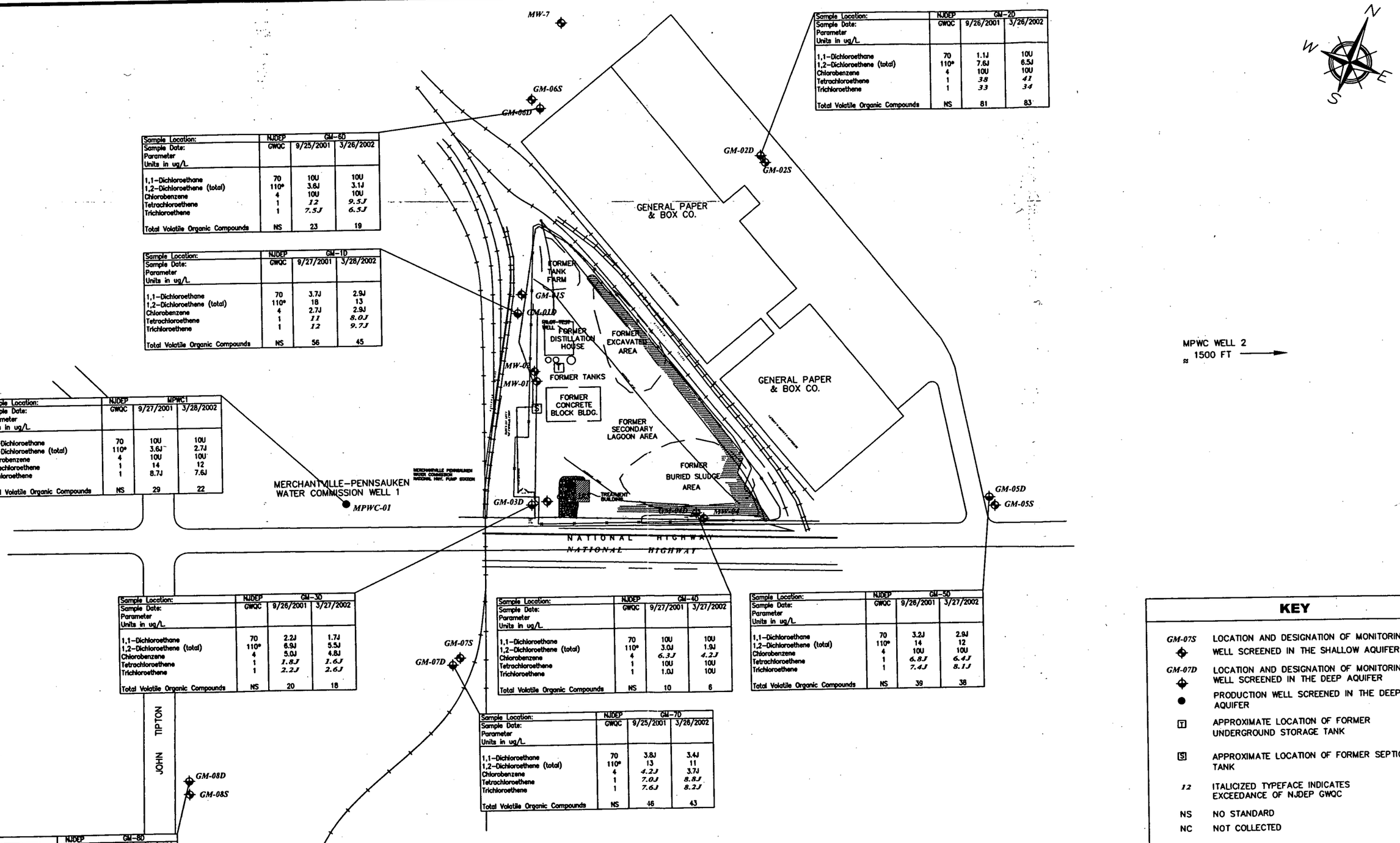
LAW Engineering and Environmental Services, P.C.
A MACTEC Company

Princeton Junction, New Jersey

January 29, 2003

MACTEC E&C Project 22000-0-0028



Sample Location:	NJDEP	GM-6D	
Sample Date:	GWQC	9/25/2001	3/26/2002
Parameter			
Units in ug/L			
1,1-Dichloroethane	70	10U	10U
1,2-Dichloroethene (total)	110*	3.6J	3.1J
Chlorobenzene	4	10U	10U
Tetrachloroethene	1	*12*	*9.5J*
Trichloroethene	1	*7.5J*	*6.5J*
Total Volatile Organic Compounds	NS	23	19

Sample Location:	NJDEP	GM-1D	
Sample Date:	GWQC	9/27/2001	3/28/2002
Parameter			
Units in ug/L			
1,1-Dichloroethane	70	3.7J	2.9J
1,2-Dichloroethene (total)	110*	18	13
Chlorobenzene	4	2.7J	2.9J
Tetrachloroethene	1	*11*	*8.0J*
Trichloroethene	1	*12*	*9.7J*
Total Volatile Organic Compounds	NS	56	45

Sample Location:	NJDEP	MPWC1	
Sample Date:	GWQC	9/27/2001	3/28/2002
Parameter			
Units in ug/L			
1,1-Dichloroethane	70	10U	10U
1,2-Dichloroethene (total)	110*	3.6J	2.7J
Chlorobenzene	4	10U	10U
Tetrachloroethene	1	14	12
Trichloroethene	1	8.7J	7.6J
Total Volatile Organic Compounds	NS	29	22

Sample Location:	NJDEP	GM-2D	
Sample Date:	GWQC	9/26/2001	3/26/2002
Parameter			
Units in ug/L			
1,1-Dichloroethane	70	1.1J	10U
1,2-Dichloroethene (total)	110*	7.6J	6.5J
Chlorobenzene	4	10U	10U
Tetrachloroethene	1	*38*	*41*
Trichloroethene	1	*33*	*34*
Total Volatile Organic Compounds	NS	81	83

Sample Location:	NJDEP	GM-3D	
Sample Date:	GWQC	9/26/2001	3/27/2002
Parameter			
Units in ug/L			
1,1-Dichloroethane	70	2.2J	1.7J
1,2-Dichloroethene (total)	110*	6.9J	5.5J
Chlorobenzene	4	5.0J	4.8J
Tetrachloroethene	1	*1.8J*	*1.6J*
Trichloroethene	1	*2.2J*	*2.6J*
Total Volatile Organic Compounds	NS	20	18

Sample Location:	NJDEP	GM-4D	
Sample Date:	GWQC	9/27/2001	3/27/2002
Parameter			
Units in ug/L			
1,1-Dichloroethane	70	10U	10U
1,2-Dichloroethene (total)	110*	3.0J	1.9J
Chlorobenzene	4	*6.3J*	*4.2J*
Tetrachloroethene	1	10U	10U
Trichloroethene	1	1.0J	10U
Total Volatile Organic Compounds	NS	10	6

Sample Location:	NJDEP	GM-5D	
Sample Date:	GWQC	9/26/2001	3/27/2002
Parameter			
Units in ug/L			
1,1-Dichloroethane	70	3.2J	2.9J
1,2-Dichloroethene (total)	110*	14	12
Chlorobenzene	4	10U	10U
Tetrachloroethene	1	*6.8J*	*6.4J*
Trichloroethene	1	*7.4J*	*8.1J*
Total Volatile Organic Compounds	NS	39	38

Sample Location:	NJDEP	GM-7D	
Sample Date:	GWQC	9/25/2001	3/26/2002
Parameter			
Units in ug/L			
1,1-Dichloroethane	70	3.8J	3.4J
1,2-Dichloroethene (total)	110*	13	11
Chlorobenzene	4	*4.2J*	3.7J
Tetrachloroethene	1	*7.0J*	*8.8J*
Trichloroethene	1	*7.6J*	*8.2J*
Total Volatile Organic Compounds	NS	46	43

Sample Location:	NJDEP	GM-8D	
Sample Date:	GWQC	9/25/2001	3/25/2002
Parameter			
Units in ug/L			
1,1-Dichloroethane	70	4.5J	4.5J
1,2-Dichloroethene (total)	110*	12	18
Chlorobenzene	4	3.8J	*4.8J*
Tetrachloroethene	1	*4.6J*	*4.1J*
Trichloroethene	1	*6.1J*	*6.3J*
Total Volatile Organic Compounds	NS	38	41

KEY

GM-07S	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE SHALLOW AQUIFER
GM-07D	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE DEEP AQUIFER
●	PRODUCTION WELL SCREENED IN THE DEEP AQUIFER
T	APPROXIMATE LOCATION OF FORMER UNDERGROUND STORAGE TANK
S	APPROXIMATE LOCATION OF FORMER SEPTIC TANK
12	ITALICIZED TYPEFACE INDICATES EXCEEDANCE OF NJDEP GWQC
NS	NO STANDARD
NC	NOT COLLECTED

SWOPE OIL AND CHEMICAL COMPANY

PENNSAUKEN, NEW JERSEY

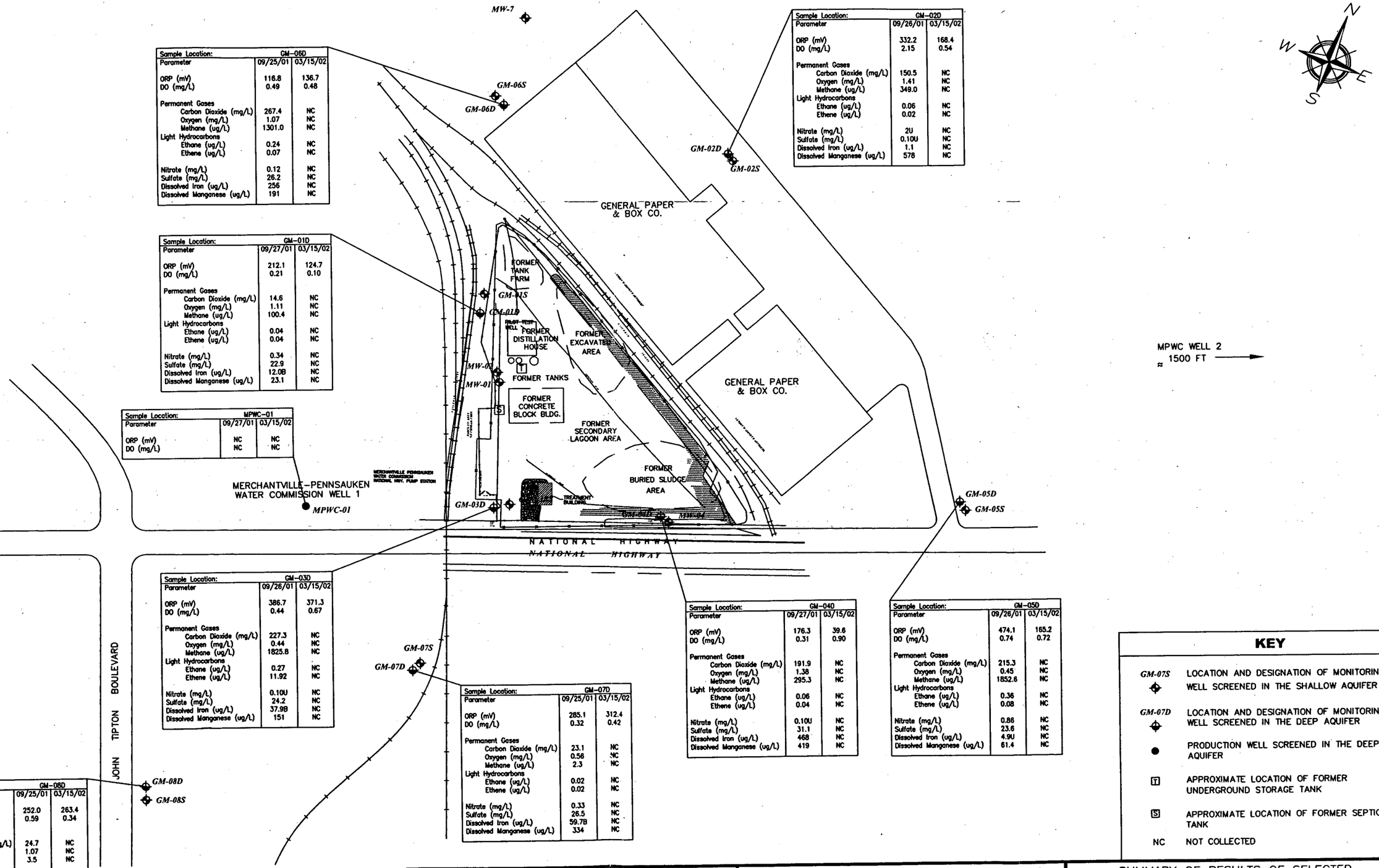
MACTEC

MACTEC Engineering and Consulting, Inc. of Georgia
14 Washington Road, Building 1
Princeton Junction, NJ

SUMMARY OF SELECTED VOLATILE ORGANIC COMPOUNDS REPORTED IN THE DEEP AQUIFER

PROJECT NO. 22000-0-0028 DATE: 11/25/02
PREPARED: EK
CHECKED: DJN
FIGURE 3

FILE: P:\FROM LAW\PROJECT\SWOPE\CADD\GIS-ANALYTICAL\ANALYTICAL DATA.DWG, DATE: 12/04/2002 11:01:29AM Layout: DEEP VOC



Sample Location:	GM-06D	
Parameter	09/25/01	03/15/02
ORP (mV)	116.8	136.7
DO (mg/L)	0.49	0.48
Permanent Gases		
Carbon Dioxide (mg/L)	267.4	NC
Oxygen (mg/L)	1.07	NC
Methane (ug/L)	1301.0	NC
Light Hydrocarbons		
Ethane (ug/L)	0.24	NC
Ethene (ug/L)	0.07	NC
Nitrate (mg/L)	0.12	NC
Sulfate (mg/L)	26.2	NC
Dissolved Iron (ug/L)	256	NC
Dissolved Manganese (ug/L)	191	NC

Sample Location:	GM-02D	
Parameter	09/26/01	03/15/02
ORP (mV)	332.2	168.4
DO (mg/L)	2.15	0.54
Permanent Gases		
Carbon Dioxide (mg/L)	150.5	NC
Oxygen (mg/L)	1.41	NC
Methane (ug/L)	349.0	NC
Light Hydrocarbons		
Ethane (ug/L)	0.06	NC
Ethene (ug/L)	0.02	NC
Nitrate (mg/L)	2U	NC
Sulfate (mg/L)	0.10U	NC
Dissolved Iron (ug/L)	1.1	NC
Dissolved Manganese (ug/L)	578	NC

Sample Location:	GM-01D	
Parameter	09/27/01	03/15/02
ORP (mV)	212.1	124.7
DO (mg/L)	0.21	0.10
Permanent Gases		
Carbon Dioxide (mg/L)	14.6	NC
Oxygen (mg/L)	1.11	NC
Methane (ug/L)	100.4	NC
Light Hydrocarbons		
Ethane (ug/L)	0.04	NC
Ethene (ug/L)	0.04	NC
Nitrate (mg/L)	0.34	NC
Sulfate (mg/L)	22.9	NC
Dissolved Iron (ug/L)	12.0B	NC
Dissolved Manganese (ug/L)	23.1	NC

Sample Location:	MPWC-01	
Parameter	09/27/01	03/15/02
ORP (mV)	NC	NC
DO (mg/L)	NC	NC

Sample Location:	GM-03D	
Parameter	09/26/01	03/15/02
ORP (mV)	386.7	371.3
DO (mg/L)	0.44	0.67
Permanent Gases		
Carbon Dioxide (mg/L)	227.3	NC
Oxygen (mg/L)	0.44	NC
Methane (ug/L)	1825.8	NC
Light Hydrocarbons		
Ethane (ug/L)	0.27	NC
Ethene (ug/L)	11.92	NC
Nitrate (mg/L)	0.10U	NC
Sulfate (mg/L)	24.2	NC
Dissolved Iron (ug/L)	37.9B	NC
Dissolved Manganese (ug/L)	151	NC

Sample Location:	GM-04D	
Parameter	09/27/01	03/15/02
ORP (mV)	176.3	39.6
DO (mg/L)	0.31	0.90
Permanent Gases		
Carbon Dioxide (mg/L)	191.9	NC
Oxygen (mg/L)	1.38	NC
Methane (ug/L)	295.3	NC
Light Hydrocarbons		
Ethane (ug/L)	0.06	NC
Ethene (ug/L)	0.04	NC
Nitrate (mg/L)	0.10U	NC
Sulfate (mg/L)	31.1	NC
Dissolved Iron (ug/L)	468	NC
Dissolved Manganese (ug/L)	419	NC

Sample Location:	GM-05D	
Parameter	09/26/01	03/15/02
ORP (mV)	474.1	165.2
DO (mg/L)	0.74	0.72
Permanent Gases		
Carbon Dioxide (mg/L)	215.3	NC
Oxygen (mg/L)	0.45	NC
Methane (ug/L)	1852.6	NC
Light Hydrocarbons		
Ethane (ug/L)	0.36	NC
Ethene (ug/L)	0.08	NC
Nitrate (mg/L)	0.86	NC
Sulfate (mg/L)	23.6	NC
Dissolved Iron (ug/L)	4.9U	NC
Dissolved Manganese (ug/L)	61.4	NC

Sample Location:	GM-07D	
Parameter	09/25/01	03/15/02
ORP (mV)	285.1	312.4
DO (mg/L)	0.32	0.42
Permanent Gases		
Carbon Dioxide (mg/L)	23.1	NC
Oxygen (mg/L)	0.56	NC
Methane (ug/L)	2.3	NC
Light Hydrocarbons		
Ethane (ug/L)	0.02	NC
Ethene (ug/L)	0.02	NC
Nitrate (mg/L)	0.33	NC
Sulfate (mg/L)	26.5	NC
Dissolved Iron (ug/L)	59.7B	NC
Dissolved Manganese (ug/L)	334	NC

Sample Location:	GM-08D	
Parameter	09/25/01	03/15/02
ORP (mV)	252.0	263.4
DO (mg/L)	0.59	0.34
Permanent Gases		
Carbon Dioxide (mg/L)	24.7	NC
Oxygen (mg/L)	1.07	NC
Methane (ug/L)	3.5	NC
Light Hydrocarbons		
Ethane (ug/L)	0.01	NC
Ethene (ug/L)	<0.01	NC
Nitrate (mg/L)	0.10U	NC
Sulfate (mg/L)	18.7	NC
Dissolved Iron (ug/L)	340	NC
Dissolved Manganese (ug/L)	283	NC

KEY

GM-07S	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE SHALLOW AQUIFER
GM-07D	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE DEEP AQUIFER
●	PRODUCTION WELL SCREENED IN THE DEEP AQUIFER
T	APPROXIMATE LOCATION OF FORMER UNDERGROUND STORAGE TANK
S	APPROXIMATE LOCATION OF FORMER SEPTIC TANK
NC	NOT COLLECTED

SWOPE OIL AND CHEMICAL COMPANY

PENNSAUKEN, NEW JERSEY

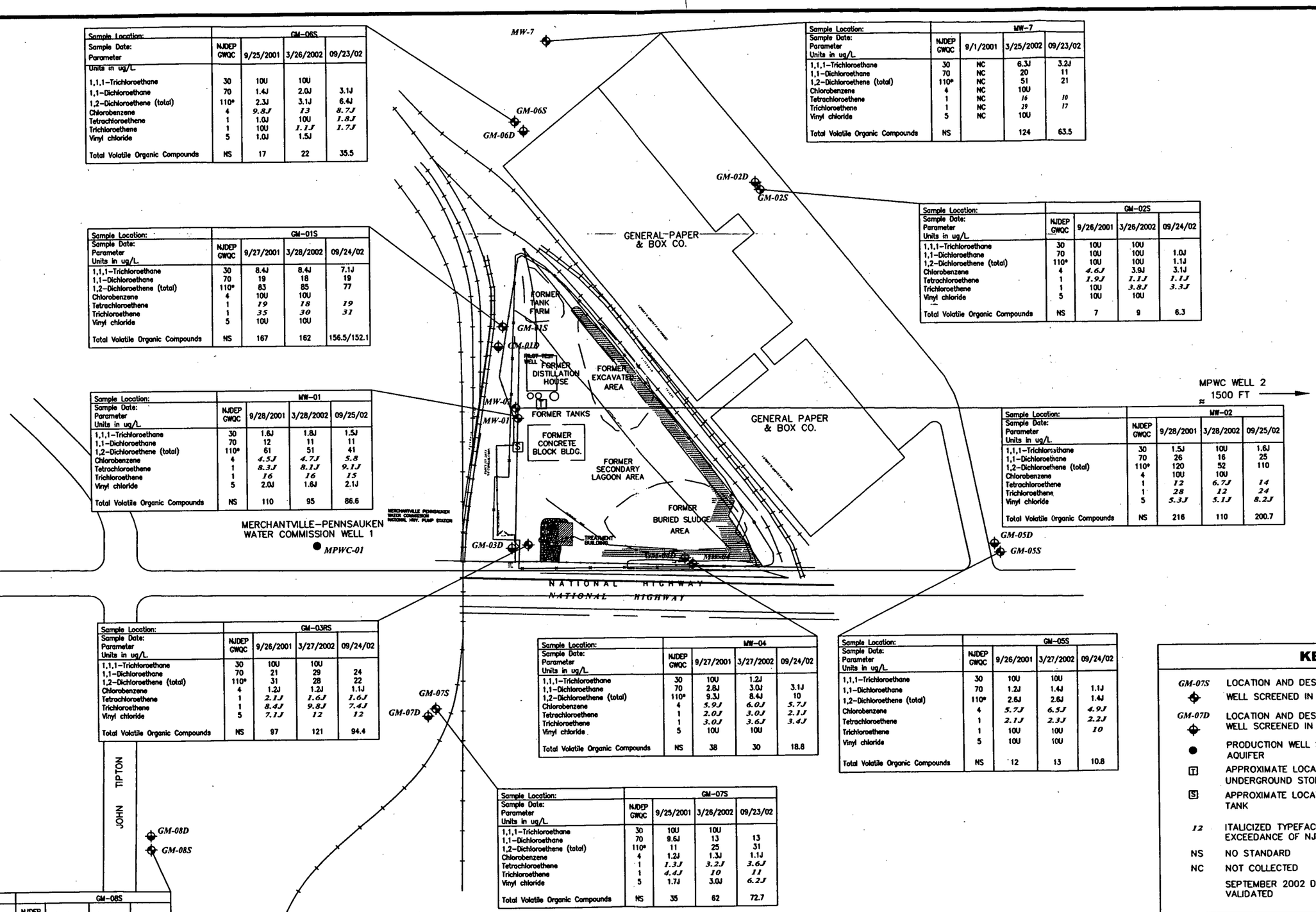
MACTEC

MACTEC Engineering and Consulting, Inc. of Georgia
14 Washington Road, Building 1
Princeton Junction, NJ

SUMMARY OF RESULTS OF SELECTED BIOGEOCHEMICAL PARAMETERS IN THE DEEP AQUIFER

PROJECT NO. 22000-0-0028 DATE: 11/25/02
PREPARED: EK
CHECKED: DJN
FIGURE 4

FILE: P:\FROM LAW\PROJECT\SWOPE\CADD\GIS-ANALYTICAL\ANALYTICAL DATA.DWG, DATE: 12/04/2002 11:02:02AM Layout: DEEP BIOGEOCHEM



Sample Location:	GM-06S			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/25/2001	3/26/2002	09/23/02
1,1,1-Trichloroethane	30	10U	10U	
1,1-Dichloroethane	70	1.4J	2.0J	3.1J
1,2-Dichloroethene (total)	110*	2.3J	3.1J	6.4J
Chlorobenzene	4	*9.8J*	*13*	*8.7J*
Tetrachloroethene	1	1.0J	10U	*1.8J*
Trichloroethene	1	10U	*1.1J*	*1.7J*
Vinyl chloride	5	1.0J	1.5J	
Total Volatile Organic Compounds	NS	17	22	35.5

Sample Location:	MW-7			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/1/2001	3/25/2002	09/23/02
1,1,1-Trichloroethane	30	NC	6.3J	3.2J
1,1-Dichloroethane	70	NC	20	11
1,2-Dichloroethene (total)	110*	NC	51	21
Chlorobenzene	4	NC	10U	
Tetrachloroethene	1	NC	*16*	*10*
Trichloroethene	1	NC	*29*	*17*
Vinyl chloride	5	NC	10U	
Total Volatile Organic Compounds	NS		124	63.5

Sample Location:	GM-02S			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/26/2001	3/26/2002	09/24/02
1,1,1-Trichloroethane	30	10U	10U	
1,1-Dichloroethane	70	10U	10U	1.0J
1,2-Dichloroethene (total)	110*	10U	10U	1.1J
Chlorobenzene	4	*4.6J*	3.9J	3.1J
Tetrachloroethene	1	*1.9J*	*1.1J*	*1.1J*
Trichloroethene	1	10U	*3.8J*	*3.3J*
Vinyl chloride	5	10U	10U	
Total Volatile Organic Compounds	NS	7	9	6.3

Sample Location:	GM-01S			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/27/2001	3/28/2002	09/24/02
1,1,1-Trichloroethane	30	8.4J	8.4J	7.1J
1,1-Dichloroethane	70	19	18	19
1,2-Dichloroethene (total)	110*	83	85	77
Chlorobenzene	4	10U	10U	
Tetrachloroethene	1	*19*	*18*	*19*
Trichloroethene	1	*35*	*30*	*31*
Vinyl chloride	5	10U	10U	
Total Volatile Organic Compounds	NS	167	162	156.5/152.1

Sample Location:	MW-01			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/28/2001	3/28/2002	09/25/02
1,1,1-Trichloroethane	30	1.6J	1.8J	1.5J
1,1-Dichloroethane	70	12	11	11
1,2-Dichloroethene (total)	110*	61	51	41
Chlorobenzene	4	*4.5J*	*4.7J*	*5.8*
Tetrachloroethene	1	*8.3J*	*8.1J*	*9.1J*
Trichloroethene	1	*16*	*16*	*15*
Vinyl chloride	5	2.0J	1.6J	2.1J
Total Volatile Organic Compounds	NS	110	95	86.6

Sample Location:	MW-02			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/28/2001	3/28/2002	09/25/02
1,1,1-Trichloroethane	30	1.5J	10U	1.6J
1,1-Dichloroethane	70	26	16	25
1,2-Dichloroethene (total)	110*	120	52	110
Chlorobenzene	4	10U	10U	
Tetrachloroethene	1	*12*	*6.7J*	*14*
Trichloroethene	1	*28*	*12*	*24*
Vinyl chloride	5	*5.3J*	*5.1J*	*8.2J*
Total Volatile Organic Compounds	NS	216	110	200.7

Sample Location:	GM-03RS			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/26/2001	3/27/2002	09/24/02
1,1,1-Trichloroethane	30	10U	10U	
1,1-Dichloroethane	70	21	29	24
1,2-Dichloroethene (total)	110*	31	28	22
Chlorobenzene	4	1.2J	1.2J	1.1J
Tetrachloroethene	1	*2.1J*	*1.6J*	*1.6J*
Trichloroethene	1	*8.4J*	*9.8J*	*7.4J*
Vinyl chloride	5	*7.1J*	*12*	*12*
Total Volatile Organic Compounds	NS	97	121	94.4

Sample Location:	MW-04			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/27/2001	3/27/2002	09/24/02
1,1,1-Trichloroethane	30	10U	1.2J	
1,1-Dichloroethane	70	2.8J	3.0J	3.1J
1,2-Dichloroethene (total)	110*	9.3J	8.4J	10
Chlorobenzene	4	*5.9J*	*6.0J*	*5.7J*
Tetrachloroethene	1	*2.0J*	*3.0J*	*2.1J*
Trichloroethene	1	*3.0J*	*3.6J*	*3.4J*
Vinyl chloride	5	10U	10U	
Total Volatile Organic Compounds	NS	38	30	18.8

Sample Location:	GM-05S			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/26/2001	3/27/2002	09/24/02
1,1,1-Trichloroethane	30	10U	10U	
1,1-Dichloroethane	70	1.2J	1.4J	1.1J
1,2-Dichloroethene (total)	110*	2.6J	2.6J	1.4J
Chlorobenzene	4	*5.7J*	*6.5J*	*4.9J*
Tetrachloroethene	1	*2.1J*	*2.3J*	*2.2J*
Trichloroethene	1	10U	10U	*10*
Vinyl chloride	5	10U	10U	
Total Volatile Organic Compounds	NS	12	13	10.8

Sample Location:	GM-07S			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/25/2001	3/26/2002	09/23/02
1,1,1-Trichloroethane	30	10U	10U	
1,1-Dichloroethane	70	9.6J	13	13
1,2-Dichloroethene (total)	110*	11	25	31
Chlorobenzene	4	1.2J	1.3J	1.1J
Tetrachloroethene	1	*1.3J*	*3.2J*	*3.6J*
Trichloroethene	1	*4.4J*	*10*	*11*
Vinyl chloride	5	1.7J	3.0J	*6.2J*
Total Volatile Organic Compounds	NS	35	62	72.7

Sample Location:	GM-08S			
Sample Date: Parameter Units in ug/L	NJDEP GWQC	9/25/2001	3/25/2002	09/23/02
1,1,1-Trichloroethane	30	10U	10U	
1,1-Dichloroethane	70	11	17	15
1,2-Dichloroethene (total)	110*	12	64	33
Chlorobenzene	4	10U	10U	
Tetrachloroethene	1	10U	10U	10
Trichloroethene	1	*2.9J*	*16*	*8.4*
Vinyl chloride	5	*5.0J*	*19*	*1*
Total Volatile Organic Compounds	NS	40	122	69.8

KEY

GM-07S	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE SHALLOW AQUIFER
GM-07D	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE DEEP AQUIFER
●	PRODUCTION WELL SCREENED IN THE DEEP AQUIFER
T	APPROXIMATE LOCATION OF FORMER UNDERGROUND STORAGE TANK
S	APPROXIMATE LOCATION OF FORMER SEPTIC TANK
12	ITALICIZED TYPEFACE INDICATES EXCEEDANCE OF NJDEP GWQC
NS	NO STANDARD
NC	NOT COLLECTED
	SEPTEMBER 2002 DATA HAS NOT BEEN VALIDATED

0 150 FT
SCALE 1" = 150'

SWOPE OIL AND CHEMICAL COMPANY

PENNSAUKEN, NEW JERSEY

MACTEC

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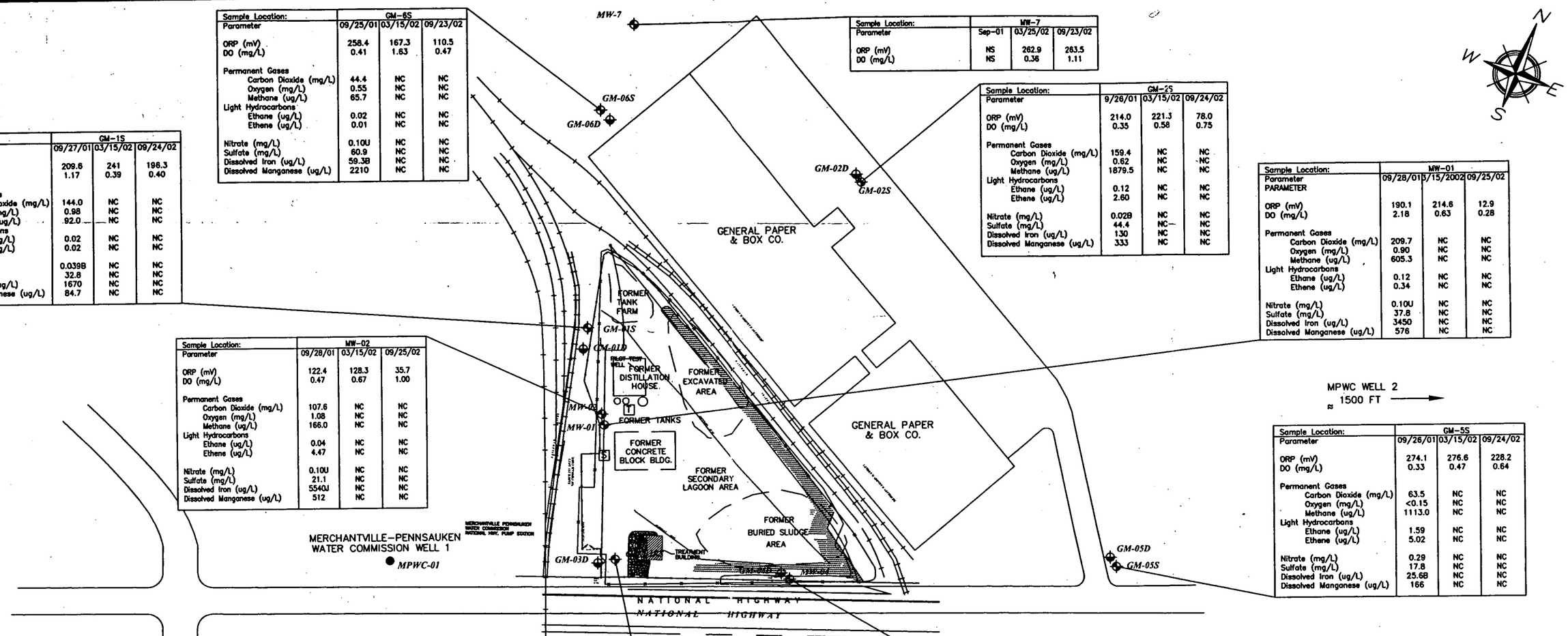
SUMMARY OF SELECTED VOLATILE ORGANIC COMPOUNDS REPORTED IN THE SHALLOW AQUIFER

PROJECT NO. 22000-0-0028 DATE: 11/25/02
PREPARED: EK
CHECKED: DJN
FIGURE 1

FILE: P:\FROM LAW\PROJECT\SWOPE\CADD\GIS-ANALYTICAL\ANALYTICAL DATA.DWG, DATE: 12/04/2002 10:29:10AM Layout: SHALLOW VOC



Sample Location:	GM-1S		
Parameter	09/27/01	03/15/02	09/24/02
ORP (mV)	209.6	241	196.3
DO (mg/L)	1.17	0.39	0.40
Permanent Gases			
Carbon Dioxide (mg/L)	144.0	NC	NC
Oxygen (mg/L)	0.98	NC	NC
Methane (ug/L)	92.0	NC	NC
Light Hydrocarbons			
Ethane (ug/L)	0.02	NC	NC
Ethene (ug/L)	0.02	NC	NC
Nitrate (mg/L)	0.039B	NC	NC
Sulfate (mg/L)	32.8	NC	NC
Dissolved Iron (ug/L)	1670	NC	NC
Dissolved Manganese (ug/L)	84.7	NC	NC

Sample Location:	GM-6S		
Parameter	09/25/01	03/15/02	09/23/02
ORP (mV)	258.4	167.3	110.5
DO (mg/L)	0.41	1.63	0.47
Permanent Gases			
Carbon Dioxide (mg/L)	44.4	NC	NC
Oxygen (mg/L)	0.55	NC	NC
Methane (ug/L)	65.7	NC	NC
Light Hydrocarbons			
Ethane (ug/L)	0.02	NC	NC
Ethene (ug/L)	0.01	NC	NC
Nitrate (mg/L)	0.10U	NC	NC
Sulfate (mg/L)	60.9	NC	NC
Dissolved Iron (ug/L)	59.3B	NC	NC
Dissolved Manganese (ug/L)	2210	NC	NC

Sample Location:	MW-7		
Parameter	Sep-01	03/25/02	09/23/02
ORP (mV)	NS	262.9	263.5
DO (mg/L)	NS	0.36	1.11

Sample Location:	GM-2S		
Parameter	9/26/01	03/15/02	09/24/02
ORP (mV)	214.0	221.3	78.0
DO (mg/L)	0.35	0.58	0.75
Permanent Gases			
Carbon Dioxide (mg/L)	159.4	NC	NC
Oxygen (mg/L)	0.62	NC	NC
Methane (ug/L)	1879.5	NC	NC
Light Hydrocarbons			
Ethane (ug/L)	0.12	NC	NC
Ethene (ug/L)	2.60	NC	NC
Nitrate (mg/L)	0.02B	NC	NC
Sulfate (mg/L)	44.4	NC	NC
Dissolved Iron (ug/L)	130	NC	NC
Dissolved Manganese (ug/L)	333	NC	NC

Sample Location:	MW-01		
Parameter PARAMETER	09/28/01	3/15/2002	09/25/02
ORP (mV)	190.1	214.6	12.9
DO (mg/L)	2.18	0.63	0.28
Permanent Gases			
Carbon Dioxide (mg/L)	209.7	NC	NC
Oxygen (mg/L)	0.90	NC	NC
Methane (ug/L)	605.3	NC	NC
Light Hydrocarbons			
Ethane (ug/L)	0.12	NC	NC
Ethene (ug/L)	0.34	NC	NC
Nitrate (mg/L)	0.10U	NC	NC
Sulfate (mg/L)	37.8	NC	NC
Dissolved Iron (ug/L)	3450	NC	NC
Dissolved Manganese (ug/L)	576	NC	NC

Sample Location:	MW-02		
Parameter	09/28/01	03/15/02	09/25/02
ORP (mV)	122.4	128.3	35.7
DO (mg/L)	0.47	0.67	1.00
Permanent Gases			
Carbon Dioxide (mg/L)	107.6	NC	NC
Oxygen (mg/L)	1.08	NC	NC
Methane (ug/L)	166.0	NC	NC
Light Hydrocarbons			
Ethane (ug/L)	0.04	NC	NC
Ethene (ug/L)	4.47	NC	NC
Nitrate (mg/L)	0.10U	NC	NC
Sulfate (mg/L)	21.1	NC	NC
Dissolved Iron (ug/L)	5540J	NC	NC
Dissolved Manganese (ug/L)	512	NC	NC

Sample Location:	GM-5S		
Parameter	09/26/01	03/15/02	09/24/02
ORP (mV)	274.1	276.6	228.2
DO (mg/L)	0.33	0.47	0.64
Permanent Gases			
Carbon Dioxide (mg/L)	63.5	NC	NC
Oxygen (mg/L)	<0.15	NC	NC
Methane (ug/L)	1113.0	NC	NC
Light Hydrocarbons			
Ethane (ug/L)	1.59	NC	NC
Ethene (ug/L)	5.02	NC	NC
Nitrate (mg/L)	0.29	NC	NC
Sulfate (mg/L)	17.8	NC	NC
Dissolved Iron (ug/L)	25.68	NC	NC
Dissolved Manganese (ug/L)	166	NC	NC

Sample Location:	GM-07S		
Parameter	09/25/01	03/15/02	09/23/02
ORP (mV)	193.0	116.8	84.9
DO (mg/L)	0.58	0.45	0.65
Permanent Gases			
Carbon Dioxide (mg/L)	147.2	NC	NC
Oxygen (mg/L)	0.41	NC	NC
Methane (ug/L)	424.7	NC	NC
Light Hydrocarbons			
Ethane (ug/L)	0.06	NC	NC
Ethene (ug/L)	0.03	NC	NC
Nitrate (mg/L)	0.10U	NC	NC
Sulfate (mg/L)	16.5	NC	NC
Dissolved Iron (ug/L)	2120	NC	NC
Dissolved Manganese (ug/L)	2180	NC	NC

Sample Location:	GM-03RS		
Parameter	09/26/01	03/15/02	09/24/02
ORP (mV)	216.0	127.2	157.0
DO (mg/L)	0.60	0.46	0.70
Permanent Gases			
Carbon Dioxide (mg/L)	180.4	NC	NC
Oxygen (mg/L)	0.53	NC	NC
Methane (ug/L)	417.4	NC	NC
Light Hydrocarbons			
Ethane (ug/L)	0.10	NC	NC
Ethene (ug/L)	0.02	NC	NC
Nitrate (mg/L)	0.10U	NC	NC
Sulfate (mg/L)	16.6	NC	NC
Dissolved Iron (ug/L)	833	NC	NC
Dissolved Manganese (ug/L)	553	NC	NC

Sample Location:	MW-04		
Parameter	09/27/01	03/15/02	09/24/02
ORP (mV)	228.0	336.0	233.0
DO (mg/L)	0.60	0.49	0.67
Permanent Gases			
Carbon Dioxide (mg/L)	139.2	NC	NC
Oxygen (mg/L)	0.79	NC	NC
Methane (ug/L)	121.7	NC	NC
Light Hydrocarbons			
Ethane (ug/L)	0.02	NC	NC
Ethene (ug/L)	0.01	NC	NC
Nitrate (mg/L)	0.10U	NC	NC
Sulfate (mg/L)	30.1	NC	NC
Dissolved Iron (ug/L)	571	NC	NC
Dissolved Manganese (ug/L)	381	NC	NC

Sample Location:	GM-08S		
Parameter	09/25/01	03/15/02	09/23/02
ORP (mV)	-85.1	-57.2	-85.2
DO (mg/L)	0.38	0.39	0.42
Permanent Gases			
Carbon Dioxide (mg/L)	159.2	NC	NC
Oxygen (mg/L)	0.66	NC	NC
Methane (ug/L)	135.4	NC	NC
Light Hydrocarbons			
Ethane (ug/L)	0.08	NC	NC
Ethene (ug/L)	0.01	NC	NC
Nitrate (mg/L)	0.10U	NC	NC
Sulfate (mg/L)	3.9	NC	NC
Dissolved Iron (ug/L)	51300	NC	NC
Dissolved Manganese (ug/L)	1310	NC	NC

KEY

GM-07S	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE SHALLOW AQUIFER
GM-07D	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE DEEP AQUIFER
●	PRODUCTION WELL SCREENED IN THE DEEP AQUIFER
T	APPROXIMATE LOCATION OF FORMER UNDERGROUND STORAGE TANK
S	APPROXIMATE LOCATION OF FORMER SEPTIC TANK
NC	NOT COLLECTED
NS	NOT SAMPLED

0 150 FT
SCALE 1" = 150'

SWOPE OIL AND CHEMICAL COMPANY

PENNSAUKEN, NEW JERSEY

MACTEC
MACTEC Engineering and Consulting, Inc. of Georgia
14 Washington Road, Building 1
Princeton Junction, NJ

SUMMARY OF RESULTS OF SELECTED BIOGEOCHEMICAL PARAMETERS IN THE SHALLOW AQUIFER

PROJECT NO. 22000-0-0028 DATE: 11/25/02
PREPARED: EK
CHECKED: DJN
FIGURE 2

FILE: P:\FROM LAW\PROJECT\SWOPE\CADD\GIS-ANALYTICAL\ANALYTICAL DATA.DWG; DATE: 12/04/2002 11:00:42AM Layout: SHALLOW BIOGEOCHEM

September 2002
Semi-Annual Ground-Water Monitoring Report
Swope Oil Superfund Site
Pennsauken, New Jersey

Scott Horsnall
Project Geologist

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EXECUTIVE SUMMARY

LAW Engineering and Environmental Services, P.C., a MACTEC Company, (MACTEC) has completed the September 2002 ground-water sampling event at the Swope Oil and Chemical Company Site (Swope) in Pennsauken, New Jersey. MACTEC completed the five-year ground-water monitoring program in March 2002, in accordance with the requirements of the Consent Decree that was lodged with the Court on May 19, 1993. However, the Swope Site Cleanup Committee (Committee) elected to perform an additional ground-water sampling round to monitor ground-water conditions during the continued operation of the soil vapor extraction system (SVE) system. The SVE system has been operating since September 1997 and has removed an estimated 20,300 pounds of volatile organic compounds (VOCs) from the vadose zone (LAW, 2002)

Review of ground-water data indicates horizontal and vertical ground-water flow directions consistent with the March 2002 sampling event. The horizontal component of ground-water flow is in a southeasterly to southerly direction (with a slight southwest component in the deep aquifer downgradient) in both the shallow and deep aquifers at the Swope site, which is consistent with the flow direction observed since June 1998. However, ground-water levels in the shallow aquifer were 0.14 to 0.39 feet lower than the water levels measured during March 2002. Water levels in the deep aquifer were 0.11 to 0.36 feet lower than those reported for March 2002, with the exception of GM-5D (0.20 feet higher).

Review of the ground-water quality data indicates that the concentrations of volatile organic compounds (VOCs) are generally consistent with those observed during the previous sampling event. However, slight decreases of VOC concentrations in many of the shallow downgradient wells were observed during the September sampling event as compared to the March 2002 event. The VOCs 1,2-dichloroethene, tetrachloroethene, trichloroethene and chlorobenzene are the predominant compounds detected in ground water in the shallow aquifer at the Swope site.

The overall improvement in ground-water quality since December 1996 is attributable to on-going natural attenuation processes and, in part, to the surficial site cleanup activities performed by the Swope Potentially Responsible Parties (PRPs) in the late 1980s. In addition, the on-going operation of the SVE system at the Swope site has removed more than 20,000 pounds of total VOCs from the unsaturated zone, which has contributed to the improvement in ground-water quality.

1.0 INTRODUCTION

This report discusses the results of the September 2002 ground-water quality sampling event completed at the Swope site. During September 2002, groundwater samples were collected from the shallow aquifer for VOC analysis only. Although not required as part of the May 19, 1993 Consent Decree, MACTEC personnel on behalf of the Committee, elected to collect ground-water samples from the shallow aquifer monitoring wells only for VOCs analysis to further the evaluation of ground-water conditions at the Swope site.

Fifteen water-level measurement and ground-water sampling events have been completed at the Swope site. The first two sampling events (December 1996 and February 1997) represent pre-SVE remediation (background) conditions. The SVE remediation system was initially started in February 1997, ran briefly and then was shut down before being restarted in September 1997. The subsequent sampling events constitute 13 events (December 1997; March, June, September, and December 1998; March and September 1999; March and October 2000; March and September 2001; and March and September 2002) of monitoring during operation of the SVE system.

This report contains background information regarding site location, site history, previous investigations, and site monitoring network. In addition, the methods of field data collection and a discussion of the water-level data and ground-water quality results are presented, followed by conclusions.

2.0 BACKGROUND

2.1 SITE LOCATION

The Swope site is located in an industrial area of Pennsauken Township in Camden County, New Jersey (Figure 1). As shown on Figure 2, the Swope site is roughly triangular in shape, encompasses about 1.9 acres, and is bounded to the north-northeast and southwest by railroad tracks and warehouses, and to the southeast by National Highway.

2.2 SITE HISTORY

Between 1965 and 1979, Swope allegedly operated a chemical reclamation facility at the site, which included buying, selling, and processing various materials. In December 1979, the company ceased site operations.

2.3 PREVIOUS INVESTIGATIONS

A Remedial Investigation/Feasibility Study (RI/FS) was conducted by NUS Corporation (NUS) for the USEPA. The RI/FS report was submitted by NUS to the USEPA in June 1985. The USEPA Administrative Order on Consent (ACO) Index II Comprehensive Environmental Response Compensation Liability Act (CERCLA)-60113 stated that in addition to several surface cleanup remedial actions that must be performed at the Swope site, "...a supplemental RI/FS should be undertaken to evaluate the extent of ground-water contamination attributable to the facility and to develop and evaluate appropriate remedial alternatives." All work performed during the supplemental RI/FS was conducted by Geraghty & Miller, Inc. (now ARCADIS G&M) for the Swope PRPs in accordance with the ACO CERCLA-60113. Pursuant to a Consent Decree lodged and entered in 1993, an SVE system was installed during 1996 and 1997 to remediate soils in the vadose (unsaturated) zone beneath the Swope site. The SVE system began full-time operation in September 1997. At the end of September 2002, the system has been operating for 5 years and has removed approximately 20,300 pounds of VOCs from the vadose zone beneath the site (LAW, 2002). MACTEC completed the five-year ground-water monitoring program in March 2002 in accordance with the May 19, 1993 Consent Decree that was lodged with the Court.

2.4 SITE MONITORING NETWORK

The shallow aquifer and deep aquifer monitoring well network is comprised of 19 ground-water wells located on and adjacent to the Swope site, including the Merchantville-Pennsauken Water Company (MPWC) Well 1 located along National Highway, and well MW-7, which is located at the adjacent Pennsauken Landfill site. The locations of these wells are shown on Figures 2 and 3, and the wells are listed by aquifer as shown below.

Shallow - upgradient	Shallow - downgradient
GM-2S	GM-1S
GM-6S	GM-3RS
MW-7 (Pennsauken Landfill)	MW-1
	MW-2
	MW-4
	GM-5S* (side gradient)
	GM-7S
	GM-8S
Deep - upgradient	**Deep - downgradient**
GM-2D	GM-1D
GM-6D	GM-3D
	GM-4D
	GM-5D* (side gradient)
	GM-7D
	GM-8D
	MPWC-1

*Formerly upgradient, currently side gradient.

3.0 METHODOLOGY

Ground-water samples were collected by MACTEC personnel using low-flow sampling procedures in accordance with the USEPA Region II Final Ground-Water Sampling Standard Operating Procedures (SOP) (EPA 1998a). A brief description of the sampling procedures is provided below.

3.1 WATER LEVEL MEASUREMENTS

Water levels were measured in all the wells except for the municipal pumping well (MPWC-1) prior to the ground-water sampling event. Upon removing the plug from the water-level port at each well, a photoionization detector (PID) was used to monitor the breathing zone for VOCs. Water-level measurements were made to the nearest 0.01 foot using an electronic water-level measuring device (M-scope). To reduce the potential for cross contamination, the M-scope was cleaned with Micro solution and rinsed with distilled water prior to being lowered into each well. The depth-to-water was measured from a designated measuring point at the top of the well seal and recorded on a form. The depth-to-water value was then subtracted from the appropriate measuring point elevation to calculate the water-level elevation relative to mean sea level. Water-level measurements are provided in Table 1.

3.2 WELL EVACUATION

The USEPA approved the use of the low-flow ground-water sampling technique for the Swope site in February 1999 (USEPA, 1999). This technique was implemented by first selecting the "midpoint of the most permeable zone in the screened interval" as required by the USEPA (USEPA 1998a). To collect the data needed to select the most permeable zones, down-hole logging of pH, temperature, specific conductivity, oxidation-reduction potential (ORP), and dissolved oxygen was conducted at two-foot intervals within the screen zone of each monitoring well (except MPWC-1) between March 2 and March 8, 1999. The physiochemical data and natural gamma logs for each well, (which were obtained during the RI and supplemental RI) were reviewed to select the most permeable zone/optimal pump-intake depths. Where review of the data did not conclusively indicate where to set the pump-intake, the mid-point of the screen section was selected. Upon receiving USEPA approval of pump intake and mid-point depths (USEPA 1999), dedicated pump assemblies were then installed in each monitoring well.

The dedicated pump assemblies consist of a submersible stainless steel Grundfos Redi-Flo II pump, Teflon-lined polyethylene tubing, and Teflon-coated stainless steel pump-hanging cable. Low-flow purging of each well was conducted as described below. The depth to water was measured during purging using an M-scope. Water was pumped from the well at a flow rate of about 200 milliliters per minute (ml/min) to 500 ml/min; the flow rate was monitored using a graduated beaker and watch. The pump tubing was connected at the surface to an inline flow-through cell for measuring the following field parameters: pH, temperature, specific conductance, ORP potential, dissolved oxygen, and turbidity. The field parameters were measured with a calibrated YSI 600 XL meter and a LaMotte Turbidimeter 2020. During purging, the depth to water and field parameters were measured at five-minute intervals and recorded on ground-water sampling logs, which are provided in Appendix A. Each well was considered stabilized and ready to sample when field parameter values recorded over three consecutive readings were within the following ranges: pH (+/-0.1), specific conductance (+/-3%), ORP potential (+/-10 mV), dissolved oxygen (10%), and turbidity (10%).

Water purged from the wells was passed through a carbon filter and stored on-site in a polyethylene tank pending USEPA approval to pass the water through a green sand filter and then discharge it to the ground surface on-site.

3.3 SAMPLE COLLECTION

Ground-water samples were collected by disconnecting the pump tubing from the flow through cell, lowering the pumping rate to a rate of about 100 to 250 ml/min, and directing water from the pump tubing directly into pre-labeled bottles prepared by the laboratory. Field parameters are summarized in Table 2. The field parameter values were recorded on ground-water sampling logs provided in Appendix A.

Sample bottles were packed on ice in a cooler with a chain-of-custody form and shipped via courier to Severn Trent Laboratories (STL) of Pittsburgh, Pennsylvania for analysis.

Ground-water and quality assurance/quality control (QA/QC) samples were analyzed for VOCs by USEPA Method CLP OLM03.2. One replicate sample and one matrix spike/matrix spike duplicate

(MS/MSD) sample were collected and submitted to the laboratory for analysis. A trip blank was submitted to the laboratory. Copies of the laboratory reports are provided in Appendix B.

3.4 DATA ANALYSIS

The depth to ground-water measurement was subtracted from the respective surveyed measuring point elevation to calculate the static ground-water elevation in each well. The water-level elevation data for September 2002 is presented in Table 1. Water-level data collected during September 2002 for the shallow aquifer and deep aquifer were contoured and are shown on Figures 2 and 3, respectively. Discussion of ground-water level data is presented in the Ground-Water Movement section of this report.

Ground-water field parameters measured at the time of sample collection during the September 2002 monitoring event are provided in Table 2. Ground-water quality data received from STL were validated by MACTEC, and data qualifiers were assigned to the data where necessary. The validated data were imported into the database; the VOC results for the September 2002 sampling event are presented in Table 3. A discussion of the ground-water quality data is presented in the Ground-Water Quality section of this report.

4.0 GROUND-WATER MOVEMENT

The ground-water levels in the shallow aquifer were 0.14 to 0.39 feet lower during September 2002 than the water levels measured during March 2002. Ground-water levels in the deep aquifer were 0.11 to 0.36 feet lower during September 2002 as compared to March 2002, except GM-5D, which was 0.20 feet higher as compared to March 2002.

As shown on Figure 2, the configuration of the water table measured on September 23, 2002 shows that the horizontal component of ground-water flow in the shallow aquifer at and near the Swope site is predominately in a southeasterly direction, which is consistent with the flow direction observed since June 1998. Prior to June 1998 ground-water flow was more southerly than currently observed.

The configuration of the potentiometric surface in the deep aquifer on September 23, 2002 (Figure 3) shows that the horizontal component of flow in this aquifer at and near the Swope site is in a southeasterly to southerly direction (with a slight southwest component in the downgradient). Similar to the shallow aquifer, the ground-water flow direction in the deep aquifer has shifted from predominately a southerly direction to a southeasterly direction. The likely reason for the shift in flow direction in both the shallow and deep aquifers may be related to changes in ground-water pumpage in the area, including the shutdown of the nearby MPWC National Highway Well No.1.

Comparison of ground-water levels at each cluster indicates that there is a downward ground-water flow component from the shallow aquifer to the deep aquifer at the following well clusters: GM-1, GM-2, GM-3, GM-4, GM-7, GM-6, and GM-8. This downward vertical flow direction is consistent with the vertical flow direction observed during the previous sampling event. An upward vertical flow direction was observed in well cluster GM-5.

5.0 GROUND-WATER QUALITY

Review of the analytical results of the September 2002 ground-water sampling event indicates that VOCs are present in the shallow upgradient/side-gradient wells and downgradient wells of the Swope site. Concentrations of individual VOCs detected in the shallow aquifer ranged from estimated concentrations below the detection limit to 110 micrograms per liter (µg/L).

A total of 14 VOCs were detected in the shallow upgradient wells, including MW-7, and in the downgradient wells (see Table 3). Five VOCs (1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,2-dichloroethane, chloroethane, and vinyl chloride) were detected in the shallow downgradient wells but, were not detected in the upgradient wells. The VOC typically reported at the highest concentration in the shallow aquifer monitoring wells was 1,2-dichloroethene (total), which is consistent with previous sampling events.

Five VOCs (1,2-dichloroethene (total), tetrachloroethene, trichloroethene, benzene, and chlorobenzene) were detected in the shallow upgradient wells at concentrations above the New Jersey Department of Environmental Protection (NJDEP) Class IIA ground-water quality criteria (GWQC) for their respective compounds. 1,2-dichloroethene (total) was detected in shallow upgradient well MW-7 at a concentration of (21 µg/L), which is above the GWQC. Well MW-7 exhibited the highest concentrations of tetrachloroethene (10 µg/L) and trichloroethene (17 µg/L) of the shallow upgradient wells (MW-7, GM-2S, GM-5S, and GM-6S). Tetrachloroethene, trichloroethene, benzene, and chlorobenzene were detected in shallow upgradient wells GM-2S, GM-5S, and GM-6S, but at estimated concentrations slightly above the GWQC for the compounds.

Seven VOCs (1,1-dichloroethene, 1,2-dichloroethane, 1,2-dichloroethene (total), tetrachloroethene, trichloroethene, chlorobenzene, and vinyl chloride) were detected in the shallow downgradient wells (MW-1, MW-2, GM-1S, GM-3RS, MW-4, GM-7S, GM-8S) at concentrations above the GWQC. The highest concentrations of 1,2-dichloroethene, tetrachloroethene, and trichloroethene were reported in wells GM-1S and MW-2. As shown on Figure 2, wells GM-1S and MW-2 are generally downgradient to side-gradient of well MW-7. During the September 2002 sampling event, 1,2-dichloroethene (total) was detected in the shallow downgradient wells at concentrations ranging from 10 to 110 µg/L, which is above the GWQC (10 µg/L). Tetrachloroethene concentrations in well GM-1S and MW-2 were reported at 19 µg/L and 14 µg/L, respectively, which are above the NJDEP GWQC (1 µg/L). Trichloroethene

concentrations reported in wells GM-1S and MW-2 were 31 µg/L and 24 µg/L respectively, which are also above the NJDEP GWQC (1 µg/L). In general, with the exception of well GM-1S, concentrations of tetrachloroethene and trichloroethene reported in shallow downgradient wells were lower than concentrations reported in the shallow offsite upgradient well MW-7. During the September 2002 sampling event, the concentrations of tetrachloroethene and trichloroethene in well GM-1S (19 and 31 µg/L, respectively) were slightly above the concentrations reported in well MW-7 (10 and 17 µg/L, respectively). However, as indicated above, well MW-7 has been sampled twice during the Swope monitoring program; concentrations trends cannot confidently be determined at this time.

Chlorobenzene was detected in downgradient wells MW-1 and MW-4 at concentrations slightly above the GWQC (4 µg/L). 1,1-dichloroethene was reported in well GM-1S at an estimated concentration (2.8J µg/L) slightly above the GWQC (2 µg/L). 1,2-dichloroethane was detected in shallow downgradient wells MW-2 and GM-3RS at concentrations of 16 µg/L and 23 µg/L, respectively, which are above the GWQC (2 µg/L). The concentrations of 1,2-dichloroethane in wells MW-4, GM-7S, and GM-8S were slightly above the GWQC. Vinyl chloride was detected in shallow downgradient wells MW-2, GM-3RS, GM-7S and GM-8S at concentrations ranging from 6.2 µg/L to 12 µg/L, which are above the GWQC (5 µg/L).

The apparent trend of the types and concentrations of compounds observed in the shallow upgradient and shallow downgradient wells suggest that degradation of tetrachloroethene and trichloroethene is occurring. Specifically, this observation is supported by the presence of 1,2-dichloroethene (total) and vinyl chloride in the shallow downgradient wells at higher concentrations than the shallow upgradient wells. Vinyl chloride and 1,2-dichloroethene are common degradation products of tetrachloroethene and trichloroethene. In addition, the relatively higher concentrations of total VOCs in offsite upgradient well MW-7 in comparison to on-site shallow wells that are located downgradient of well MW-7 suggest the presence of an offsite source, upgradient of the Swope site. The increasing trend of total VOCs in several offsite, downgradient shallow wells (wells GM-3RS, GM-7S, and GM-8S) may be related to the suspected offsite source and the shift in the direction of the horizontal component of ground-water flow observed over the last several sampling rounds.

6.0 CONCLUSIONS

The water-level maps (September 23, 2002) indicate that the horizontal component of ground-water flow is in a southeasterly to southerly direction (with a slight southwest component in the deep aquifer downgradient) in both the shallow and deep aquifers at the Swope site, which is consistent with the flow direction observed since June 1998. The vertical component of ground-water flow is generally downward from the shallow aquifer to the deep aquifer, which is also consistent with the previous monitoring events. Ground-water levels in the shallow aquifer were 0.14 to 0.39 feet lower than water levels observed during the March 2002 round. Similarly ground-water levels in the deep aquifer were 0.11 to 0.36 feet lower (except GM-5D 0.20 feet higher) during the September 2002 sampling round as compared to those reported for March 2002.

Review of the ground-water quality data indicates that the types and concentrations of detected VOCs are generally consistent with the concentrations reported during the previous sampling events. However, slight decreases of VOC concentrations in shallow downgradient wells were observed during the September sampling event as compared to the March 2002 event. The VOCs 1,2-dichloroethene, tetrachloroethene, trichloroethene and chlorobenzene are the predominant compounds detected in ground water at the Swope site.

The overall improvement in ground-water quality is attributable to the on-going natural attenuation processes and in part, the surficial site cleanup activities performed by the Swope PRPs in the late 1980s. In addition, the on-going operation of the SVE system at the Swope site has removed approximately 20,300 pounds of total VOCs from the unsaturated zone, which has contributed to the overall improvement in ground-water quality.

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USEPA, 1999. Letter from Mr. Joseph Gowers, EPA, to Mr. Douglas J. Newton, Bell Environmental, dated March 1, 1999.

TABLES

Table 1
Summary of Ground-Water Elevations at the Swope Oil and Chemical Company Site
Pennsauken, New Jersey.
MACTEC Project Number 22000-0-0028

Well ID	Current Reference Point Elevation (ft msl)	September 23, 2002 Measured Depth to Water (ft)	Ground-Water Elevation (ft msl)
Shallow Aquifer			
MW-1	65.08	79.39	-14.31
MW-2	65.56	79.73	-14.17
GM-1S	68.03	82.21	-14.18
GM-2S	60.69*	74.82	-14.13
GM-3RS	66.35	80.73	-14.38
MW-4	61.74	76.18	-14.44
GM-5S	52.97	67.38	-14.41
GM-6S	61.66	75.75	-14.09
GM-7S	66.84	81.24	-14.40
GM-8S	71.11	85.62	-14.51
MW-7 (PSL)	71.11	85.33	-14.22
Deep Aquifer			
GM-1D	67.99	82.27	-14.28
GM-2D	60.86	75.22	-14.36
GM-3D	66.71	81.32	-14.61
GM-4D	62.53	77.02	-14.49
GM-5D	53.75	67.90	-14.15
GM-6D	61.31	75.61	-14.30
GM-7D	66.42	81.24	-14.82
GM-8D	70.12	85.08	-14.96

Notes:
ft feet
msl mean sea level
* GM-2S new elevation of +0.12 feet; wellhead modification 5/1/02
PSL Pennsauken Landfill

Prepared/Date: SH 11/27/02 SH
Checked/Date: EK 11/28/02 EK

Table 2
Results of Final Field Parameter Measurements of Ground-Water Samples Collected September 2002 at the Swope Oil and Chemical Company Site, Pennsauken, New Jersey.
MACTEC Project Number 22000-0-0028

Well ID	Temperature (°C)	pH	Specific Conductance (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)
Shallow Aquifer						
MW-1	16.12	5.63	301	12.9	0.28	0.60
MW-2	17.39	5.89	152	35.7	1.00	1.6
GM-1S	16.40	5.13	68	196.3	0.40	1.6
GM-2S	18.15	5.90	305	78.0	0.75	3.2
GM-3RS	15.21	5.06	142	157.0	0.70	2.04
MW-4	14.99	4.95	201	233.0	0.67	1.7
GM-5S	17.19	5.54	245	228.2	0.64	0.0
GM-6S	16.51	5.68	478	110.5	0.47	2.6
GM-7S	16.70	5.46	162	84.9	0.65	2.6
GM-8S	18.20	6.31	315	-85.2	0.42	55.0
MW-7 (PSL)	18.90	4.94	37	263.5	1.11	3.7
Deep Aquifer						
GM-1D	NC	NC	NC	NC	NC	NC
GM-2D	NC	NC	NC	NC	NC	NC
GM-3D	NC	NC	NC	NC	NC	NC
GM-4D	NC	NC	NC	NC	NC	NC
GM-5D	NC	NC	NC	NC	NC	NC
GM-6D	NC	NC	NC	NC	NC	NC
GM-7D	NC	NC	NC	NC	NC	NC
GM-8D	NC	NC	NC	NC	NC	NC
MPWC-1	NC	NC	NC	NC	NC	NC

Field parameter readings measured at time of sample collection

°C Degrees centigrade.
uS/cm Microsiemens per centimeter.
ORP Oxidation-reduction potential.
mV Millivolts.
DO Dissolved Oxygen.
mg/L Milligrams per liter.
NTU Nephelometric turbidity units.
NC Not collected.
PSL Pennsauken Landfill

Swope\gw\data\FieldparaSept2002.xls

Prepared/Date: EK 10/30/02
Checked/Date: SH 10/30/02

Swope Oil and Chemical Company
MACTEC 22000-0-0028

Table 3. Results of Volatile Organic Analyses of Groundwater Samples Collected During September 2002 at the Swope Oil and Chemical Company Site, Pennsauken, New Jersey

	Shallow Aquifer				Shallow Aquifer			
	Upgradient Wells				Downgradient Wells			
Sample Location:	GM-2S	GM-5S	GM-6S	MW-7	GM-1S	GM-1S Rep	GM-3RS	NJDEP
Sample Date:	9/24/2002	9/24/2002	9/23/2002	9/23/2002	9/24/2002	9/24/2002	9/24/2002	GWQC
Parameter Units in ug/L.								
1,1,1-Trichloroethane	10U	10U	10U	3.2J	7.1J	7.1J	10U	30
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	2
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	1.0J	3
1,1-Dichloroethane	1.0J	1.1J	3.1J	11	19	18	24	70
1,1-Dichloroethene	10U	10U	10U	1.3J	2.8J	3.0J	10U	2
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	23	2
1,2-Dichloroethene (total)	1.1J	1.4J	6.4J	21	77	75	22	10*
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U	1
2-Butanone	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	300
2-Hexanone	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	100
4-Methyl-2-pentanone	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	400
Acetone	10U	1.2J	10U	10U	10U	10U	10U	700
Benzene	10U	10U	1.0J	10U	10U	10U	10U	1
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U	1
Bromoform	10U	10U	10U	10U	10U	10U	10U	4
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10
Carbon disulfide	10U	10U	10U	10U	10U	10U	10U	800
Carbon tetrachloride	10U	10U	10U	10U	10U	10U	10U	2
Chlorobenzene	3.1J	4.9J	8.7J	10U	10U	10U	1.1J	4
Chloroethane	10U	10U	10U	10U	10U	10U	2.3J	100
Chloroform	10U	10U	10U	10U	10U	10U	10U	6
Chloromethane	10U	10U	10U	10U	10U	10U	10U	30
cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U	5
Dibromochloromethane	10U	10U	10U	10U	10U	10U	10U	10
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U	700
Methylene chloride	10U	10U	10U	10U	10U	10U	10U	2
Styrene	10U	10U	10U	10U	10U	10U	10U	100
Tetrachloroethene	1.1J	2.2J	1.8J	10	19	19	1.6J	1
Toluene	10U	10U	10U	10U	10U	10U	10U	1000
trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U	7
Trichloroethene	3.3J	10U	1.7J	17	31	30	7.4J	1
Vinyl chloride	10U	10U	10U	10U	10U	10U	12	5
Xylenes (total)	10U	10U	10U	10U	10U	10U	10U	30
Total Volatile Organic Compounds	10	11	23	64	156	153	95	

ug/L Micrograms per liter.
CRQL Contract Required Quantitation Limit.
MDL Method Detection Limit.
REP Replicate.
J Estimated value and/or concentration less than the CRQL, but greater than the MDL.
U Not detected.
* Criteria based on cis-1,2-dichloroethene (10 ug/L)

Swope Oil and Chemical Company
MACTEC 22000-0-0028

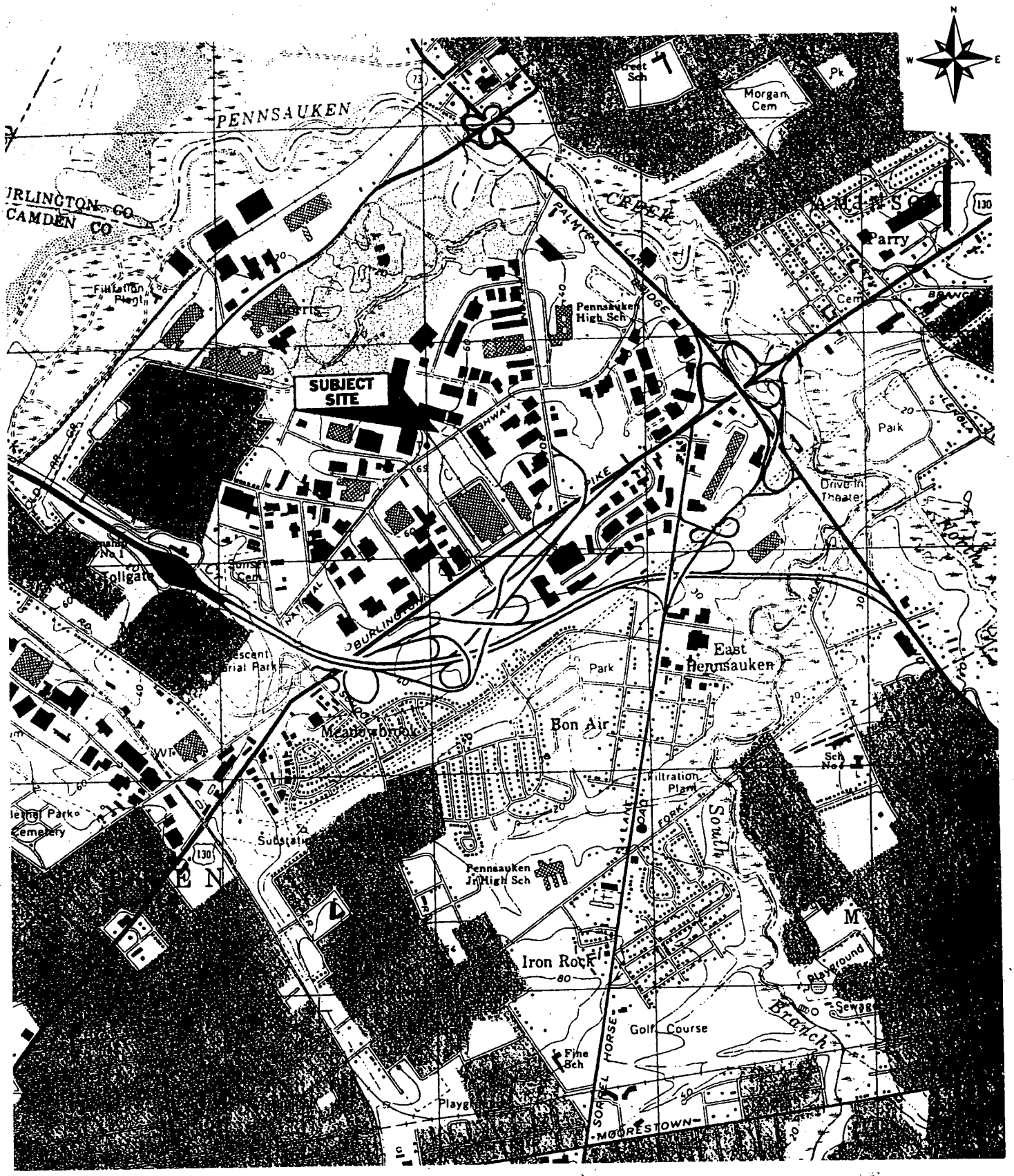
Table 3. Results of Volatile Organic Analyses of Groundwater Samples Collected During September 2002 at the Swope Oil and Chemical Company Site, Pennsauken, New Jersey

	Shallow Aquifer						
	Downgradient Wells					Trip Blank	
Sample Location:	MW-1	MW-2	MW-4	GM-7S	GM-8S	TB-092502	NJDEP
Sample Date:	9/24/2002	9/24/2002	9/24/2002	9/23/2002	9/23/2002	9/25/2002	GWQC
Parameter Units in ug/L.							
1,1,1-Trichloroethane	1.4J	1.6J	10U	10U	10U	10U	30
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	2
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	3
1,1-Dichloroethane	11	25	3.1J	13	15	10U	70
1,1-Dichloroethene	1.4J	1.9J	1.1J	10U	10U	10U	2
1,2-Dichloroethane	10U	16	2.2J	5.6J	3.4J	10U	2
1,2-Dichloroethene (total)	41	110	10	31	33	10U	10*
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	1
2-Butanone	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	300
2-Hexanone	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	100
4-Methyl-2-pentanone	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	400
Acetone	10U	10U	10U	1.2J	10U	10U	700
Benzene	10U	10U	10U	10U	10U	10U	1
Bromodichloromethane	10U	10U	10U	10U	10U	10U	1
Bromoform	10U	10U	10U	10U	10U	10U	4
Bromomethane	10U	10U	10U	10U	10U	10U	10
Carbon disulfide	10U	10U	10U	10U	10U	10U	800
Carbon tetrachloride	10U	10U	10U	10U	10U	10U	2
Chlorobenzene	5.8J	10U	5.7J	1.1J	10U	10U	4
Chloroethane	10U	10U	10U	10U	10U	10U	100
Chloroform	10U	10U	1.2J	10U	10U	10U	6
Chloromethane	10U	10U	10U	10U	10U	10U	30
cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	5
Dibromochloromethane	10U	10U	10U	10U	10U	10U	10
Ethylbenzene	10U	10U	10U	10U	10U	10U	700
Methylene chloride	10U	10U	10U	10U	10U	10U	2
Styrene	10U	10U	10U	10U	10U	10U	100
Tetrachloroethene	9.1J	14	2.1J	3.6J	10U	10U	1
Toluene	10U	10U	10U	10U	10U	10U	1000
trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	7
Trichloroethene	15	24	3.4J	11	8.4J	10U	1
Vinyl chloride	2.1J	8.2J	10U	6.2J	10	10U	5
Xylenes (total)	10U	10U	10U	10U	10U	10U	30
Total Volatile Organic Compounds	87	201	29	73	70	0	

ug/L Micrograms per liter.
CRQL Contract Required Quantitation Limit.
MDL Method Detection Limit.
REP Replicate.
J Estimated value and/or concentration less than the CRQL, but greater than the MDL.
U Not detected.
* Criteria based on cis-1,2-dichloroethene (10 ug/L)

Prepared by/Date: MPL 11/6/02 MPL
Checked by/Date: SH 12/6/02 SH

FIGURES



SOURCE: USGS 7.5-MIN SERIES (TOPOGRAPHIC) QUADRANGLE, CAMDEN, NEW JERSEY

0 2000 4000
SCALE 1"=2000'

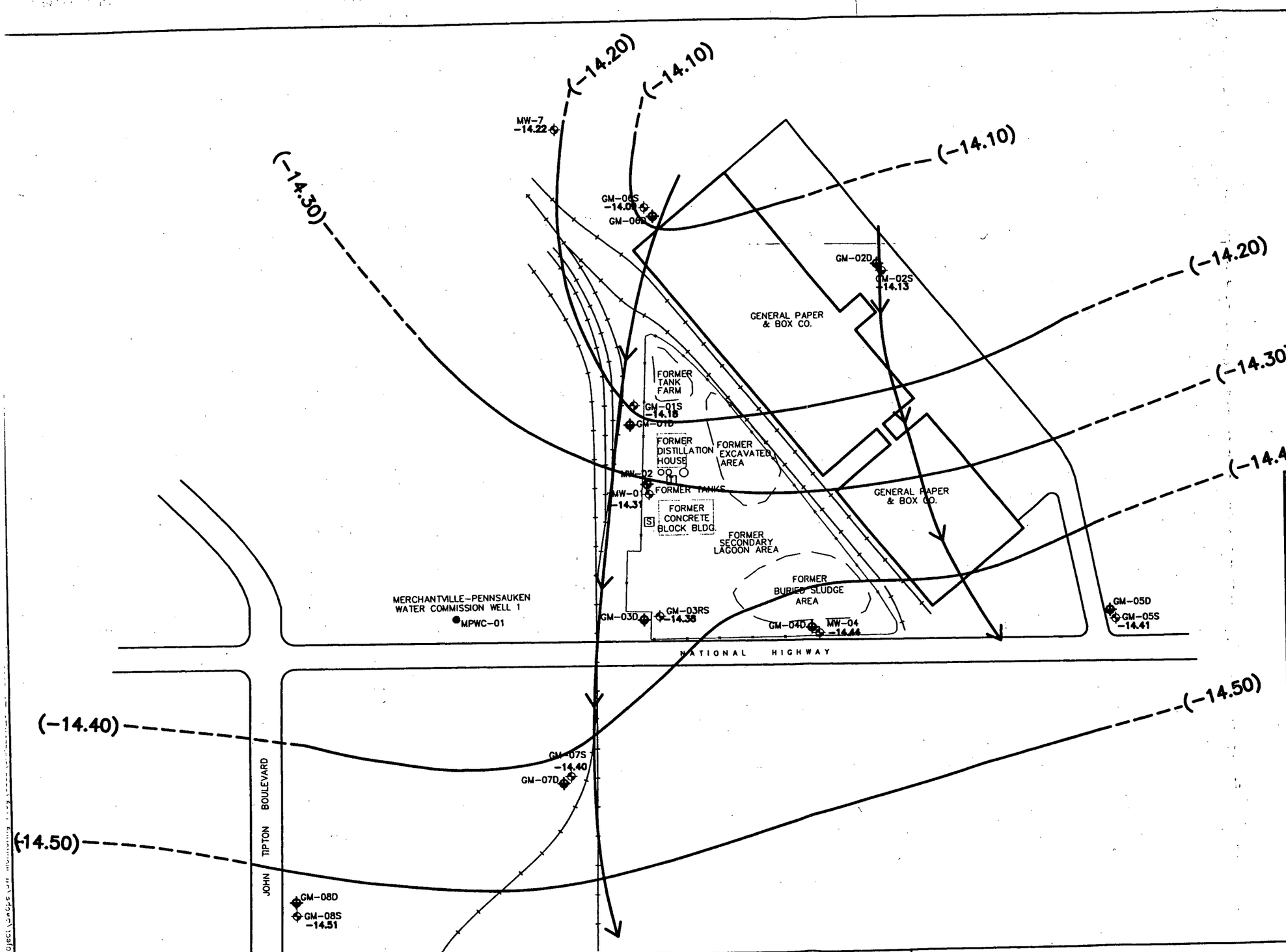
SWOPE OIL & CHEMICAL COMPANY
PENNSAUKEN, NEW JERSEY

MACTEC

MACTEC Engineering and Consulting
14 Washington RD, Building 1, 1st Floor
Princeton Junction, NJ 08550

SITE LOCATION AND TOPOGRAPHIC MAP

PROJECT: 22000-0-0028
PREPARED: SH
CHECKED: DJN
FIGURE 1
DATE: 1/29/03



KEY

GM-07S	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE SHALLOW AQUIFER
GM-07D	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE DEEP AQUIFER
●	PRODUCTION WELL SCREENED IN THE DEEP AQUIFER
T	APPROXIMATE LOCATION OF FORMER UNDERGROUND STORAGE TANK
S	APPROXIMATE LOCATION OF FORMER SEPTIC TANK
(-14.10)	LINE OF EQUAL WATER-TABLE ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL (DASHED WHERE INFERRED)
→	DIRECTION OF HORIZONTAL COMPONENT OF GROUND-WATER FLOW

CONTOUR INTERVAL SHOWN

0 150 300 FT
SCALE:

SWOPE OIL & CHEMICAL COMPANY
PENNSAUKEN, NEW JERSEY

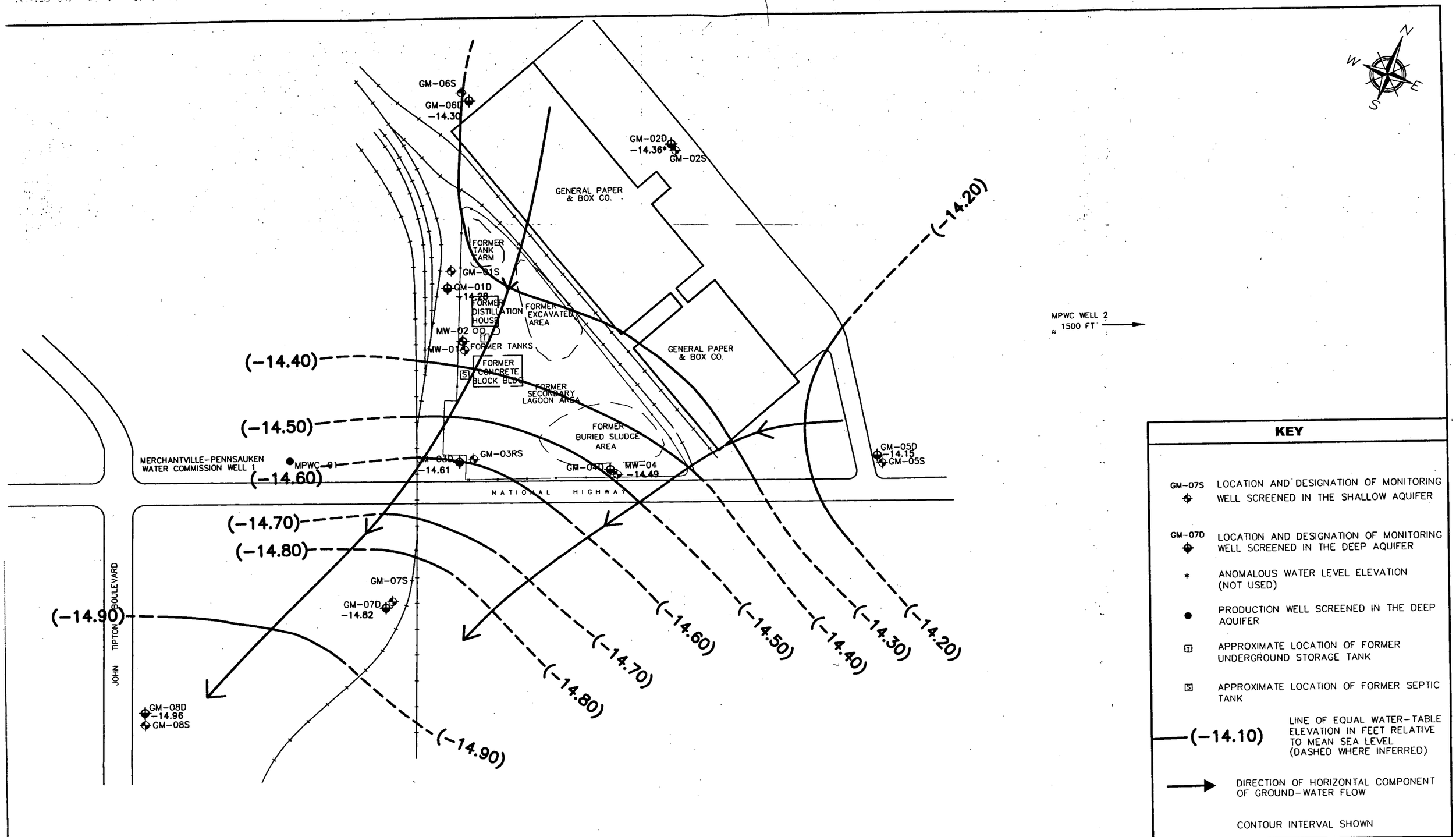
PREPARED BY: SH
DRAWN BY: MW
CHECKED BY: DJH
DATE: 6/15/01

MACTEC
MACTEC Engineering and Consulting, Inc.
14 Washington Road, Building 1
Princeton Junction, NJ

CONFIGURATION OF THE WATER TABLE IN THE SHALLOW AQUIFER MEASURED ON SEPTEMBER 23, 2002

PROJECT NO. 22000-0-0028

FIGURE 2



KEY

GM-07S	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE SHALLOW AQUIFER
GM-07D	LOCATION AND DESIGNATION OF MONITORING WELL SCREENED IN THE DEEP AQUIFER
*	ANOMALOUS WATER LEVEL ELEVATION (NOT USED)
●	PRODUCTION WELL SCREENED IN THE DEEP AQUIFER
T	APPROXIMATE LOCATION OF FORMER UNDERGROUND STORAGE TANK
S	APPROXIMATE LOCATION OF FORMER SEPTIC TANK
(-14.10)	LINE OF EQUAL WATER-TABLE ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL (DASHED WHERE INFERRED)
→	DIRECTION OF HORIZONTAL COMPONENT OF GROUND-WATER FLOW

CONTOUR INTERVAL SHOWN

0 150 300 FT
SCALE:

SWOPE OIL & CHEMICAL COMPANY
PENNSAUKEN, NEW JERSEY

PREPARED BY: SH
DRAWN BY: MW
CHECKED BY: DJN
DATE: 6/15/01

MACTEC
MACTEC Engineering and Consulting, Inc.
14 Washington Road, Building 1
Princeton Junction, NJ

POTENTIOMETRIC SURFACE IN THE DEEP AQUIFER MEASURED ON SEPTEMBER 23, 2002

PROJECT NO. 22000-0-0028

FIGURE 3

APPENDIX A

GROUND-WATER SAMPLING LOGS

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028 Phase/Task: 100/110 Well ID: MW-1

Date: 9/25/02 Sampled By: SH

Sampling Time: 0840 Recorded By: SH

Weather: Sunny 65°F Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI 600XL Serial #: A0 02A0527

Purging Information

Casing Material: Stainless Steel Purge Method: Grunfos Submersible Pump

Casing Diameter: 4 in. Screen Interval (ft bmp): Top 110 Bottom 130

Total Depth (ft bmp): 130 Pump Intake Depth (ft bmp): 120

Depth to Water (ft bmp): 79.44 Purge time Start: 0740 Finish: 0835

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	Comments
0740	0	500		14.91	7.43	0.335	18.0	3.18	LO	79.44	
0745	5	500		14.65	6.17	0.376	37.7	2.13	LO	79.46	
0750	10	500		14.64	5.78	0.388	33.0	1.59	0.55	79.46	
0755	15	500		15.03	5.67	0.377	23.2	1.24	0.55	79.46	
0800	20	500		15.57	5.66	0.330	11.8	0.95	0.80	79.46	
0805	25	500		15.69	5.64	0.303	8.0	0.72	0.60	79.46	
0810	30	500	5 GAL	15.84	5.64	0.297	9.4	0.64	0.50	79.46	
0815	35	500		15.77	5.64	0.294	9.6	0.54	0.70	79.46	
0820	40	500		16.08	5.63	0.284	9.9	0.33	0.40	79.46	
0825	45	500		16.30	5.63	0.296	11.3	0.29	0.60	79.46	
0830	50	500		16.10	5.62	0.301	12.5	0.29	0.60	79.46	
0835	55	500		16.12	5.63	0.301	12.9	0.28	0.60	79.46	
	SAMPLE @ 0840										

Sample Condition Color: NONE Odor: NONE Appearance: Clear Non-Turbid

Sample Collection

Parameter:	Container:	No.	Preservative:
TCL VOCs	40 ml glass vial	3	HCl

Sample Identification MW-1

Comments Sampled @ 200ml/min

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028
Date: 9/25/02
Sampling Time: 1010
Weather: SUNNY 65°

Phase/Task: 100/110
Sampled By: SH
Recorded By: SH
Coded Replicate No.:

Well ID: MW-2

Instrument Identification
Water Quality Meter(s): YSI 600XL
Serial #: 02AU527

Purging Information
Casing Material: Stainless Steel
Casing Diameter: 4 in.
Total Depth (ft bmp): 102
Depth to Water (ft bmp): 79.85

Purge Method: Grunfos Submersible Pump
Screen Interval (ft bmp): Top 77 Bottom 102
Pump Intake Depth (ft bmp): 98
Purge time Start: 0850 Finish: 1005

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	Comments
0850	0	200	0	15.9	5.89	47.9	0.180	3.29		79.85	
0855	5	200		15.22	5.87	42.4	0.152	3.46	3.2	80.35	
0900	10	200		15.8	5.80	0.153	48.6	3.43	2.7	80.60	
0905	15	200		16.04	5.77	0.150	51.4	3.27	2.2	80.62	
0910	20	200		16.51	5.78	0.148	53.2	2.95	2.8	80.62	
0915	25	200		16.86	5.73	0.147	55.3	2.79	2.8	80.62	
0920	30	200		16.99	5.74	0.147	58.0	2.32	2.2	80.65	
0925	35	200		17.03	5.76	0.147	58.4	2.13	1.9	80.65	
0930	40	200		17.20	5.76	0.148	60.4	2.00	1.8	80.66	
0935	45	200		17.40	5.78	0.149	58.7	1.83	1.9	80.66	
0940	50	200		17.40	5.78	0.150	57.5	1.60	2.5	80.66	
0945	55	200		17.50	5.82	0.150	52.8	1.34	2.7	80.66	
0950	60	200		17.44	5.81	0.151	46.8	1.25	3.0	80.66	
0955	65	200		17.40	5.86	0.152	39.0	1.06	4.1	80.66	
1000	70	200		17.39	5.82	0.152	37.5	1.03	1.6	80.66	
1005	75	200		17.39	5.89	0.152	35.7	1.00	1.6	80.66	
SAMPLING TIME 1010 AM											

Sample Condition
Sample Collection
Parameter: TCL VOCs

Color: NONE
Odor: NONE
Appearance: ~~Fine~~ NON-Turbid

Container: 40 ml glass vial
No. 3
Preservative: HCl

Sample Identification MW-2

Comments

Sampled @ 200 ml/min

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028
Date: 9/24/02
Sampling Time: 1410-1415
Weather: Sunny 75°F

Phase/Task: 100/110
Sampled By: SH
Recorded By: SH
Coded Replicate No.: DUP GM-9

Well ID: GM-1S

Instrument Identification
Water Quality Meter(s): YSI 600XL
Serial #: 02 40527

Purging Information
Casing Material: Stainless Steel
Casing Diameter: 4 in.
Total Depth (ft bmp): 130
Depth to Water (ft bmp): 82.17

Purge Method: Grunfos Submersible Pump
Screen Interval (ft bmp): Top 110 Bottom 130
Pump Intake Depth (ft bmp): 116
Purge time Start: 1327 Finish: 1415

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	Comments
1330	0	425		15.56	5.31	0.069	213.2	2.25	18	82.21	
1335	5	425		15.52	5.16	0.068	203.4	0.71	22	82.20	
1340	10	425		15.67	5.14	0.069	197.2	0.70	9.5	82.20	
1345	15	425		15.89	5.14	0.069	193.6	0.69	5.6	82.20	
1350	20	425		16.01	5.15	0.068	192.5	0.58	4.0	82.20	
1355	25	425		16.17	5.15	0.067	192.5	0.50	3.2	82.20	
1400	30	425		16.34	5.14	0.067	193.8	0.44	2.6	82.20	
1405	35	425		16.29	5.14	0.068	195.5	0.41	2.1	82.20	
1410	40	425		16.40	5.13	0.068	196.3	0.40	1.6	82.20	

Sample Condition
Sample Collection
Color: colorless
Odor: None
Appearance: Non-Turbid

Parameter:	Container:	No.	Preservative:
TCL VOCs	40 ml glass vial	3	HCl

Sample Identification GM-1S

Comments

Sampled @ 200 ml/min

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028
Phase/Task: 100/110
Well ID: GM-2S
Date: 9/24/02
Sampled By: SH
Sampling Time: 0810-0915
Recorded By: SH
Weather: Sunny 70°F
Coded Replicate No.:

Instrument Identification
Water Quality Meter(s): YSI 600XL
Serial #: ~~40~~ 02 40527

Purging Information
Casing Material: Stainless Steel
Purge Method: Grunfos Submersible Pump
Casing Diameter: 4 in.
Screen Interval (ft bmp): Top 110 Bottom 130
Total Depth (ft bmp): 130
Pump Intake Depth (ft bmp): 124
Depth to Water (ft bmp): 74.83
Purge time Start: 0810 Finish: 0915

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	Comments
0810	0	450		16.18	6.47	0.492	3.2	2.68	37	74.83	
0815	5	450		16.33	6.34	0.483	0.8	2.31	35	74.83	
0820	10	450		17.07	6.21	0.433	19.2	2.02	29	74.83	
0825	15	450		17.64	6.10	0.392	34.7	1.76	26	74.83	
0830	20	450		17.75	6.06	0.379	37.8	1.47	15	74.83	
0835	25	450		17.87	6.00	0.362	54.0	1.29	10	74.83	
0840	30	450		17.93	5.95	0.344	63.9	1.15	7.1	74.83	
0845	35	450		17.96	5.94	0.327	69.0	1.01	5.8	74.83	
0850	40	450		18.06	5.92	0.315	71.6	0.83	4.7	74.83	
0855	45	450		18.10	5.90	0.305	75.3	0.77	4.1	74.83	
0900	50	450		18.12	5.89	0.305	76.1	0.76	3.8	74.83	
0905	55	450		18.14	5.90	0.306	78.2	0.77	3.9	74.83	
0910	60	450		18.15	5.90	0.305	78.0	0.75	3.7	74.83	

Sample Condition
Color: Colorless
Odor: None
Appearance: Non-Turbid

Sample Collection

Parameter:	Container:	No.	Preservative:
TCL VOCs	40 ml glass vial	3	HCl

Sample Identification GM-2S

Comments

Stopped @ 200ml/min

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028
Date: 9/24/02
Sampling Time: 905
Weather: Sunny

Phase/Task: 100/110
Sampled By: EK
Recorded By: EK
Coded Replicate No.:

Well ID: GM-3RS

Instrument Identification
Water Quality Meter(s): YSI 600XL
La Motte

Serial #: 99E0044
1770-1800

Purging Information
Casing Material: Stainless Steel
Casing Diameter: 4 in.
Total Depth (ft bmp): 130
Depth to Water (ft bmp): 80.85

Purge Method: Grunfos Submersible Pump
Screen Interval (ft bmp): Top 110 Bottom 130
Pump Intake Depth (ft bmp): 120
Purge time Start: 759 Finish: 908

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	REDOX Comments
805	5	250		13.34	5.25	0.158	282.9	0.82	1.96	81.07	1200 169.1
810	10	250		13.78	5.17	0.161	296.5	0.88	1.95	81.01	1205 171.8
815	15	250		13.97	5.16	0.157	310.9	0.95	2.06	81.01	1210 163.5
820	20	250		14.29	5.19	0.151	321.5	0.94	1.93	81.01	1215 161.1
825	25	250		14.41	5.20	0.148	333.6	0.91	2.07	81.01	1220 160.1
830	30	250		14.58	5.19	0.146	347.3	0.89	1.96	81.01	1225 158.2
835	35	250		14.75	5.18	0.146	360.7	0.85	2.01	81.01	1230 156.7
840	40	250		14.82	5.16	0.145	372.3	0.81	2.04	81.01	1235 157.0
845	45	250		14.94	5.13	0.144	391.8	0.77	2.02	81.01	
850	50	250		15.04	5.10	0.143	408.0	0.74	1.99	81.01	
855	55	250		15.09	5.09	0.143	410.6	0.72	1.70	81.01	
900	60	250		15.21	5.06	0.142	415.6	0.70	2.04	81.01	
							NOT USED				REDOX Values

Sample Condition
Sample Collection
Parameter: TCL VOCs
Color: clear
Odor: none
Appearance: non-turbid
Container: 40 ml glass vial
No. 3
Preservative: HCl

Sample Identification GM-3RS

Comments sampled at 200 ml/min
RERUN REDOX | INSTRUMENT malfunction REDOX

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028
Phase/Task: 100/110
Well ID: MW-4
Date: 9/24/02
Sampled By: EK
Sampling Time: 1050
Recorded By: EK
Weather: Sunny 70°F
Coded Replicate No.:

Instrument Identification
Water Quality Meter(s): YSI 600XL LaMotte
Serial #: 99E0049 1770-1800

Purging Information
Casing Material: Stainless Steel
Casing Diameter: 4 in.
Total Depth (ft bmp): 120
Depth to Water (ft bmp): 76.29
Purge Method: Grunfos Submersible Pump
Screen Interval (ft bmp): Top 110 Bottom 130
Pump Intake Depth (ft bmp): 120
Purge time Start: 946 Finish: 1055

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Sp. Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	Repeat Comments
950	0	400		14.02	5.04	0.189	396.7	1.83	3.51	76.30	1250 202.7
955	5	400		13.79	5.01	0.194	425.9	1.29	2.78	76.29	1255 223.7
1000	10	400		13.91	5.00	0.200	444.0	1.22	2.40	76.29	1300 227.3
1005	15	400		14.25	5.00	0.201	453.5	1.13	1.95	76.29	1305 232.1
1010	20	400		14.63	5.01	0.201	462.7	1.09	1.74	76.29	1310 234.2
1015	25	400		14.67	5.00	0.202	471.1	0.94	1.84	76.29	1315 237.0
1020	30	400		14.67	4.98	0.202	480.9	0.83	1.81	76.29	~~480.9~~
1025	35	400		14.80	4.97	0.202	487.8	0.80	1.87	76.29	1325
1030	40	400		14.81	4.97	0.202	492.1	0.72	1.70	76.29	
1035	45	400		14.81	4.96	0.202	498.3	0.68	1.90	76.29	REDOX
1040	50	400		14.92	4.95	0.201	504.0	0.66	1.77	76.29	VALUES
1045	55	400		14.99	4.95	0.201	502.0	0.67	1.70	76.29	
							NOT USED				

Sample Condition
Color: none - clear Odor: none Appearance: non-turbid

Sample Collection

Parameter:	Container:	No.	Preservative:
TCL VOCs	40 ml glass vial	3	HCl

Sample Identification MW-4

Comments Turned flow down to 200 ml/min for sample

RERUN REDOX ONLY | Instrument malfunction

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028 Phase/Task: 100/110 Well ID: GM-55

Date: 9/24/02 Sampled By: SH

Sampling Time: 1110-1115 Recorded By: SH

Weather: SUNNY 70°F Coded Replicate No.: MS/MSD

Instrument Identification

Water Quality Meter(s): YSI 600XL Serial #: 02A0527

Purging Information

Casing Material: Stainless Steel Purge Method: Grunfos Submersible Pump

Casing Diameter: 4 in. Screen Interval (ft bmp): Top 107 Bottom 127

Total Depth (ft bmp): 127 Pump Intake Depth (ft bmp): 117

Depth to Water (ft bmp): 67.47 Purge time Start: 0955 Finish: 1115

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	Comments
0955	0	500		15.94	5.68	0.255	212.7	2.44	0.0	67.48	
1000	5	500		16.16	5.58	0.257	221.9	2.04	0.0	67.48	
1005	10	500		16.34	5.58	0.257	225.9	1.88	0.0	67.48	67.48
1010	15	500		16.68	5.57	0.257	227.0	1.64	0.0	67.48	
1015	20	500		16.77	5.56	0.257	225.9	1.46	0.0	67.48	
1020	25	500		16.85	5.56	0.257	226.4	1.36	0.0	67.48	
1025	30	500		16.81	5.54	0.256	225.8	1.19	0.0	67.48	
1030	35	500		16.89	5.55	0.254	227.2	1.06	0.0	67.48	
1035	40	500		17.02	5.55	0.252	228.3	0.94	0.0	67.48	
1040	45	500		16.93	5.54	0.252	227.8	0.89	0.0	67.48	
1045	50	500		16.99	5.54	0.249	229.1	0.81	0.0	67.48	
1050	55	500		17.09	5.54	0.247	229.0	0.75	0.0	67.48	
1055	60	500		17.09	5.54	0.247	229.5	0.69	0.0	67.48	
1100	65	500		17.08	5.54	0.246	230.7	0.66	0.0	67.48	
1105	70	500		17.19	5.54	0.245	228.2	0.64	0.0	67.48	
1110	75	500									

Sample Condition Color: Colorless Odor: NONE Appearance: NON-Turbid

Sample Collection

Parameter:	Container:	No.	Preservative:
TCL VOCs	40 ml glass vial	3	HCl

Sample Identification GM-55

Comments MS/MSD - Split w/ CDM/EPA

Sampled @ 200 ml/min

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028
Date: 9/23/02
Sampling Time: 1615-1620
Weather: Sunny 75°F

Phase/Task: 100/110
Sampled By: EK
Recorded By: EK
Coded Replicate No.:

Well ID: GM-6S

Instrument Identification
Water Quality Meter(s): YSI 600XL
Serial #: 02A0527

Purging Information
Casing Material: Stainless Steel ✓
Casing Diameter: 4 in.
Total Depth (ft bmp): 120
Depth to Water (ft bmp): 75.75

Purge Method: Grunfos Submersible Pump
Screen Interval (ft bmp): Top 110 Bottom 130
Pump Intake Depth (ft bmp): 120
Purge time Start: 1528 Finish: 1620

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Sp. Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	Comments
1530	0	400		16.05	5.88	0.559	90.0	1.62	2.58	75.80	
1535	5	400		15.56	5.66	0.516	81.8	0.72	2.19	75.78	
1540	10	400		16.16	5.65	0.513	85.2	0.67	4.29	75.79	
1545	15	400		16.40	5.65	0.509	91.9	0.63	2.06	75.79	
1550	20	400		16.46	5.67	0.498	98.1	0.58	2.28	75.79	
1555	25	400		16.61	5.68	0.491	102.1	0.54	2.18	75.79	
1600	30	400		16.48	5.67	0.480	108.1	0.49	0.46	75.79	
1605	35	400		16.54	5.68	0.476	112.2	0.46	1.98	75.79	
1610	40	400		16.51	5.68	0.478	110.5	0.47	2.56	75.79	

Sample Condition
Sample Collection
Parameter: TCL VOCs

Color: colorless
Odor: NONE
Appearance: NON-TURBID

Container: 40 ml glass vial
No. 3
Preservative: HCl

Sample Identification: GM-6S

Comments: Sampled @ 200 ml/min

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028
Phase/Task: 100/110
Well ID: GM-7S
Date: 9/23/02
Sampled By: SH/EK
Sampling Time: 1505-1510
Recorded By: SH/EK
Weather: Sunny 75°F
Coded Replicate No.:

Instrument Identification
Water Quality Meter(s): YSI 600XL
Serial #: 02A0527

Purging Information
Casing Material: Stainless Steel
Purge Method: Grunfos Submersible Pump
Casing Diameter: 4 in.
Screen Interval (ft bmp): Top 110 Bottom 130
Total Depth (ft bmp): 132
Pump Intake Depth (ft bmp): 120
Depth to Water (ft bmp): 82.24
Purge time Start: 1420 Finish: 1510

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	Comments
1420	0	325		16.15	5.59	0.169	77.7	1.01	7.4	82.43	
1425	5	325		16.04	5.41	0.165	81.2	0.61	3.2	82.43	
1430	10	325		15.60	5.27	0.151	91.1	0.57	3.5	82.50	
1435	15	325		15.79	5.34	0.150	89.8	0.60	2.81	82.52	
1440	20	275		15.78	5.36	0.151	88.5	0.68	3.23	82.40	
1445	25	275		16.06	5.42	0.154	86.2	0.70	3.47	82.30	
1450	30	275		16.61	5.44	0.159	84.2	0.68	2.64	82.28	
1455	35	275		16.70	5.45	0.161	84.8	0.67	2.92	82.25	
1500	40	275		16.70	5.46	0.162	84.9	0.65	2.57	82.25	

Sample Condition
Color: Colorless
Odor: NONE
Appearance: Non-Turbid

Sample Collection

Parameter:	Container:	No.	Preservative:
TCL VOCs	40 ml glass vial	3	HCl

Sample Identification GM-7S

Comments

Sampled @ 200 ml/min

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028 Phase/Task: 100/110 Well ID: GM-8S

Date: 9/23/02 Sampled By: SH/EK

Sampling Time: 1405-1410 Recorded By: SH/EK

Weather: Pt. Sunny 75°F Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI 600XL Serial #: 02A0527

Purging Information

Casing Material: Stainless Steel Purge Method: Grunfos Submersible Pump

Casing Diameter: 4 in. Screen Interval (ft bmp): Top 110 Bottom 130

Total Depth (ft bmp): 130 Pump Intake Depth (ft bmp): 120

Depth to Water (ft bmp): 85.62 Purge time Start: 1320 Finish: 1410

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	Comments
1320	0	320		16.94	6.10	0.241	-18.0	1.82	150	85.69	
1325	5	400		16.42	6.18	0.293	-48.2	0.71	120	85.69	
1330	10	400		16.67	6.22	0.301	-58.6	0.56	70	85.69	
1335	15	400		17.27	6.25	0.306	-65.2	0.54	60	85.69	
1340	20	400		17.47	6.27	0.309	-70.1	0.49	65	85.69	
1345	25	400		17.57	6.27	0.312	-77.1	0.46	55	85.69	
1350	30	400		17.78	6.29	0.313	-81.2	0.47	55	85.69	
1355	35	400		18.08	6.30	0.313	-84.2	0.42	55	85.69	
1400	40	400		18.20	6.31	0.315	-85.2	0.42	55	85.69	

Sample Condition Color: colorless Odor: NONE Appearance: NON-TURBID

Sample Collection

Parameter:	Container:	No.	Preservative:
TCL VOCs	40 ml glass vial	3	HCl

Sample Identification GM-8S

Comments Sampled @ 200 ml/min

Groundwater Sampling Form

Swope, Pennsauken, New Jersey

Project Number: 22000-0-0028
Phase/Task: 100/110
Well ID: MW-7
Date: 9/23/02
Sampled By: JH/EK
Sampling Time: 1205-1215
Recorded By:
Weather: OVERCAST 70°F
Coded Replicate No.: PENNSAUKEN LANDFILL

Instrument Identification
Water Quality Meter(s): YSI 600XL
Serial #: 02 40 527

Purging Information
Casing Material: Stainless Steel
Purge Method: Grunfos Submersible Pump
Casing Diameter: 4 in.
Screen Interval (ft bmp): Top 95 Bottom 115
Total Depth (ft bmp): 115
Pump Intake Depth (ft bmp): ~96
Depth to Water (ft bmp): 85.33
Purge time Start: 1105 Finish: 1215

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Conductivity (mS/cm)	REDOX (mV)	DO (mg/L)	Turbidity (ntu)	Water Table (ft bmp)	Comments
1105	0	400		16.00	5.48	0.038	254.2	2.80	4.3	85.43	
1110	5	400		17.36	5.13	0.037	258.6	2.34	4.9	85.44	
1115	10	400		18.06	5.03	0.037	258.2	2.07	4.4	85.44	
1120	15	400		18.23	4.99	0.037	258.6	1.93	4.6	85.44	
1125	20	400		18.40	4.98	0.037	258.6	1.77	3.9	85.44	
1130	25	400		18.65	4.96	0.037	260.7	1.64	4.0	85.44	
1135	30	400		18.75	4.95	0.037	263.2	1.47	4.0	85.44	
1140	35	400		18.81	4.94	0.038	264.9	1.36	5.0	85.44	
1145	40	400		18.84	4.94	0.038	265.7	1.30	3.6	85.44	
1150	45	400		18.83	4.94	0.037	265.5	1.21	3.8	85.44	
1155	50	400		18.85	4.94	0.037	264.3	1.17	4.1	85.44	
1200	55	400		18.90	4.94	0.037	263.5	1.11	3.7	85.44	

Sample Condition
Color: clear
Odor: none
Appearance: non-turbid

Sample Collection

Parameter:	Container:	No.	Preservative:
TCL VOCs	40 ml glass vial	3	HCl

Sample Identification MW-7

Comments PENNSAUKEN LANDFILL / Split w/ JCA
Sampled @ 200 ml/min

APPENDIX B

LABORATORY ANALYSIS SUMMARY SHEETS

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Lab Sample ID: C2I260380 001

Matrix: (soil/water) WATER
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802G1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U J
78-93-3	2-Butanone	10	U
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	10	U
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	
75-34-3	1,1-Dichloroethane	11	U
107-06-2	1,2-Dichloroethane	10	
75-35-4	1,1-Dichloroethene	1.3	J
540-59-0	1,2-Dichloroethene (total)	21	
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	10	
108-88-3	Toluene	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 001
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802G1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	3.2	J
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	17	
75-01-4	Vinyl chloride	10	U
1330-20-7	Xylenes (total)	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Lab Sample ID: C2I260380 001

Matrix: (soil/water) WATER
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

Sample WT/Vol: 5 / mL
Work Order: E802G1AA
Dilution factor: 1
Moisture %: NA

QC Batch: 2273153

Client Sample Id: MW-7

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	Unknown	2.1385	5.1	J

FORM I - TIC

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Lab Sample ID: C2I260380 002

Matrix: (soil/water) WATER
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802H1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-8S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U J
78-93-3	2-Butanone	10	U
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	10	U
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	
75-34-3	1,1-Dichloroethane	15	
107-06-2	1,2-Dichloroethane	3.4	J
75-35-4	1,1-Dichloroethene	10	U
540-59-0	1,2-Dichloroethene (total)	33	
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	10	U
108-88-3	Toluene	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 002
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802H1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-8S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	8.4	J
75-01-4	Vinyl chloride	10	
1330-20-7	Xylenes (total)	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 002
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802H1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-8S

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
75-43-4	Methane, dichlorofluoro-	2.14	17	NJ

FORM I - TIC

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Lab Sample ID: C2I260380 003

Matrix: (soil/water) WATER
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802J1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-7S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	1.2	J
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U
78-93-3	2-Butanone	10	U J
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	1.1	J
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	13	
107-06-2	1,2-Dichloroethane	5.6	J
75-35-4	1,1-Dichloroethene	10	U
540-59-0	1,2-Dichloroethene (total)	31	
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	3.6	J
108-88-3	Toluene	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Lab Sample ID: C2I260380 003

Matrix: (soil/water) WATER
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802J1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-7S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	11	
75-01-4	Vinyl chloride	6.2	J
1330-20-7	Xylenes (total)	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 003
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802J1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-7S

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 004
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802K1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-6S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	1.0	J
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U
78-93-3	2-Butanone	10	U J
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	8.7	J
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	3.1	J
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	10	U
540-59-0	1,2-Dichloroethene (total)	6.4	J
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	1.8	J
108-88-3	Toluene	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID:C2I260380 004
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802K1AA
Dilution factor: 1
Moisture %:NA

Date Received: 09/26/02
Date Extracted:09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-6S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	1.7	J
75-01-4	Vinyl chloride	10	U
1330-20-7	Xylenes (total)	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 004
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802K1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-6S

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
593-70-4	Methane, chlorofluoro-	1.5264	38	NJ
75-43-4	Methane, dichlorofluoro-	2.1409	15	NJ
60-29-7	Ethyl ether	2.512	10	NJ
109-87-5	Methane, dimethoxy-	2.8466	7.3	NJ
1634-04-4	Propane, 2-methoxy-2-methyl-	3.7956	56	NJ
106-46-7	Benzene, 1,4-dichloro-	12.069	6.8	NJ

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 005
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802L1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-2S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U
78-93-3	2-Butanone	10	U J
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	3.1	J
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	1.0	J
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	10	U
540-59-0	1,2-Dichloroethene (total)	1.1	J
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	1.1	J
108-88-3	Toluene	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 005

Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802L1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-2S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	3.3	J
75-01-4	Vinyl chloride	10	U
1330-20-7	Xylenes (total)	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID:C2I260380 005
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802L1AA
Dilution factor: 1
Moisture %:NA

Date Received: 09/26/02
Date Extracted:09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-2S

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
7446-09-5	Sulfur dioxide	1.8845	5.3	NJ
471-29-4	Guanidine, methyl-	3.7947	16	NJ

FORM I - TIC

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Lab Sample ID: C2I260380 006

Matrix: (soil/water) WATER
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802M1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-3RS

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U J
78-93-3	2-Butanone	10	U
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	
108-90-7	Chlorobenzene	1.1	J
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	2.3	J
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	24	
107-06-2	1,2-Dichloroethane	23	
75-35-4	1,1-Dichloroethene	10	U
540-59-0	1,2-Dichloroethene (total)	22	
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	1.6	J
108-88-3	Toluene	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 006
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802M1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-3RS

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	1.0	J
79-01-6	Trichloroethene	7.4	J
75-01-4	Vinyl chloride	12	
1330-20-7	Xylenes (total)	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID:C2I260380 006
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802M1AA
Dilution factor: 1
Moisture %:NA

Date Received: 09/26/02
Date Extracted:09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-3RS

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 007

Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802N1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-5S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	1.2	J
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U
78-93-3	2-Butanone	10	U J
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	4.9	J
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	1.1	J
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	10	U
540-59-0	1,2-Dichloroethene (total)	1.4	J
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	2.2	J
108-88-3	Toluene	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID:C2I260380 007
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL Date Received: 09/26/02
Work Order: E802N1AA Date Extracted:09/30/02
Dilution factor: 1 Date Analyzed: 09/30/02
Moisture %:NA

QC Batch: 2273153

Client Sample Id: GM-5S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	10	U
75-01-4	Vinyl chloride	10	U
1330-20-7	Xylenes (total)	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 007
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802N1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-5S

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

LAW ENGINEERING & ENVIRONMENTAL SERVICES
MATRIX SPIKE DUPLICATE COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID:C2I260380 007
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL Date Received: 09/26/02
Work Order: E802N1AD Date Extracted:09/30/02
Dilution factor: 1 Date Analyzed: 09/30/02
Moisture %:NA

QC Batch: 2273153

Client Sample Id: GM-5S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	41.7	p
108-90-7	Chlorobenzene	47.9	
75-35-4	1,1-Dichloroethene	46.5	
108-88-3	Toluene	43.9	p
79-01-6	Trichloroethene	41.7	p

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES
MATRIX SPIKE COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID:C2I260380 007
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802N1AC
Dilution factor: 1
Moisture %:NA

Date Received: 09/26/02
Date Extracted:09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-5S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	48.7	
108-90-7	Chlorobenzene	54.2	
75-35-4	1,1-Dichloroethene	52.8	
108-88-3	Toluene	51.0	
79-01-6	Trichloroethene	48.8	

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 008
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802P1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U
78-93-3	2-Butanone	10	U J
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	5.7	J
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	1.2	J
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	3.1	J
107-06-2	1,2-Dichloroethane	2.2	J
75-35-4	1,1-Dichloroethene	1.1	J
540-59-0	1,2-Dichloroethene (total)	10	
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	2.1	J
108-88-3	Toluene	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 008
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802P1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	3.4	J
75-01-4	Vinyl chloride	10	U
1330-20-7	Xylenes (total)	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID:C2I260380 008
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802P1AA
Dilution factor: 1
Moisture %:NA

Date Received: 09/26/02
Date Extracted:09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-4

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 009
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802Q1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U
78-93-3	2-Butanone	10	U J
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	10	U
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	18	
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	3.0	J
540-59-0	1,2-Dichloroethene (total)	75	
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	19	
108-88-3	Toluene	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 009
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802Q1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	7.1	J
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	30	
75-01-4	Vinyl chloride	10	U
1330-20-7	Xylenes (total)	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 009
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802Q1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-9

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
75-43-4	Methane, dichlorofluoro-	2.1435	7.7	NJ
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FORM I - TIC

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 010
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802R1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-1S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U
78-93-3	2-Butanone	10	U J
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	10	U
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	19	
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	2.8	J
540-59-0	1,2-Dichloroethene (total)	77	
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	19	
108-88-3	Toluene	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 010
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802R1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: GM-1S

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	7.1	J
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	31	
75-01-4	Vinyl chloride	10	U
1330-20-7	Xylenes (total)	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID:C2I260380 010
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL Date Received: 09/26/02
Work Order: E802R1AA Date Extracted:09/30/02
Dilution factor: 1 Date Analyzed: 09/30/02
Moisture %:NA

QC Batch: 2273153

Client Sample Id: GM-1S

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
75-43-4	Methane, dichlorofluoro-	2.1375	5.2	NJ

FORM I - TIC

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 011

Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802T1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U
78-93-3	2-Butanone	10	U J
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	5.8	J
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	11	
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	1.4	J
540-59-0	1,2-Dichloroethene (total)	41	
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	9.1	J
108-88-3	Toluene	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Lab Sample ID: C2I260380 011

Matrix: (soil/water) WATER
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802T1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ~~ug/L~~	Q
71-55-6	1,1,1-Trichloroethane	~~1.6~~ 1.4	J
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	15	
75-01-4	Vinyl chloride	2.1	J
1330-20-7	Xylenes (total)	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 011
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802T1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-1

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
75-43-4	Methane, dichlorofluoro-	2.1437	12	NJ
60-29-7	Ethyl ether	2.5147	6.2	NJ
1634-04-4	Propane, 2-methoxy-2-methyl-	3.7984	18	NJ

FORM I - TIC

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Lab Sample ID: C2I260380 012

Matrix: (soil/water) WATER
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802V1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U
78-93-3	2-Butanone	10	U J
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	10	U
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	25	
107-06-2	1,2-Dichloroethane	16	
75-35-4	1,1-Dichloroethene	1.9	J
540-59-0	1,2-Dichloroethene (total)	110	
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U
591-78-6	2-Hexanone	10	U J
75-09-2	Methylene chloride	10	U
108-10-1	4-Methyl-2-pentanone	10	U J
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	14	
108-88-3	Toluene	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 012
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802V1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	1.6	J
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	24	
75-01-4	Vinyl chloride	8.2	J
1330-20-7	Xylenes (total)	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 012
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802V1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: MW-2

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Lab Sample ID: C2I260380 013

Matrix: (soil/water) WATER
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

Sample WT/Vol: 5 / mL
Work Order: E802W1AA
Dilution factor: 1
Moisture %: NA

QC Batch: 2273153

Client Sample Id: TB092502

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	10	U
71-43-2	Benzene	10	U
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	10	U
74-83-9	Bromomethane	10	U J
78-93-3	2-Butanone	10	U
75-15-0	Carbon disulfide	10	U
56-23-5	Carbon tetrachloride	10	U
108-90-7	Chlorobenzene	10	U
124-48-1	Dibromochloromethane	10	U
75-00-3	Chloroethane	10	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	10	U
75-34-3	1,1-Dichloroethane	10	U
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
100-41-4	Ethylbenzene	10	U J
591-78-6	2-Hexanone	10	U
75-09-2	Methylene chloride	10	U J
108-10-1	4-Methyl-2-pentanone	10	U
100-42-5	Styrene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	10	U
108-88-3	Toluene	10	U

FORM I

STL Pittsburgh

LAW ENGINEERING & ENVIRONMENTAL SERVICES

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 013
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802W1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: TB092502

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	10	U
75-01-4	Vinyl chloride	10	U
1330-20-7	Xylenes (total)	10	U

FORM I

LAW ENGINEERING & ENVIRONMENTAL SERVICES
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C2I260380 013
Method: OCLP OLM03.2
Volatile Organics, GC/MS (CLP-OLM03.2)

Sample WT/Vol: 5 / mL
Work Order: E802W1AA
Dilution factor: 1
Moisture %: NA

Date Received: 09/26/02
Date Extracted: 09/30/02
Date Analyzed: 09/30/02

QC Batch: 2273153

Client Sample Id: TB092502

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

STL ~~Edison~~ Pittsburgh G-6'

777 New Durham Road
Edison, New Jersey 08817
Phone: (732) 549-3900 Fax: (732) 549-3679

CHAIN OF CUSTODY / ANALYSIS REQUEST

PAGE 1 OF 2

Name (for report and invoice): DOUG NEWTON	Samplers Name (Printed): SCOTT Horsnall	Site/Project Identification: SWOPE - PENNSAUKEN, NJ
Company: LAW Engineering & Environmental Services	P.O. #: 22000-0-0028	State (Location of site): NJ: ☒ NY: ☐ Other:
Address: 14 Washington Rd, Building 1	Analysis Turnaround Time: Standard ☒	Regulatory Program: EPA
City: Princeton Jct State: NJ 08550	Rush Charges Authorized For: 2 Week ☐ 1 Week ☐ Other ☐	
Phone: 609-936-0700 Fax: 609-936-1020		

ANALYSIS REQUESTED (ENTER "X" BELOW TO INDICATE REQUEST)

LAB USE ONLY
Project No:
Job No:

Sample Identification	Date	Time	Matrix	No. of Cont.	TCL VOC by OLM03.2 + TICS											Sample Numbers
MW-7	9/23/02	1205	WATER	3	3											
GM-8S	↓	1405		3	3											
GM-7S	↓	1505		3	3											
GM-6S	↓	1615		3	3											
GM-2S	9/24/02	0915		3	3											
GM-3RS	↓	0905		3	3											
GM-5S	↓	1110		3	3											
GM-5S MS	↓	1110		3	3											
GM-5S MSD	↓	1110		3	3											
MW-4	↓	1050		3	3											

Preservation Used: 1 = ICE, 2 = HCl, 3 = H_2SO_4, 4 = HNO_3, 5 = NaOH
6 = Other _____, 7 = Other _____

Soil:
Water: 2

Special Instructions: Any Questions Please Contact Scott Horsnall @ 609-936-0700

Water Metals Filtered (Yes/No)? _____

Relinquished by	Company	Date / Time	Received by	Company
1) [signature]	LAW	9/23/02 1145	1) [signature]	SL
2) [signature]	SL	9/24 1145	2)	
3)		9/26/02 1015	3) Patrick Faust	STL
4)			4)	

Laboratory Certifications: New Jersey (12028), New York (11452), Pennsylvania (68-522), Connecticut (PH-0200), Rhode Island (132).

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STL Pittsburgh

STL ~~EDISON~~ PITTSBURGH
~~777 New Durham Road~~
~~Edison, New Jersey 08817~~
~~Phone: (732) 549-3900 Fax: (732) 549-3679~~

CHAIN OF CUSTODY / ANALYSIS REQUEST

Name (for report and invoice): DOUG NEWTON	Samplers Name (Printed): SCOTT HORSNALL	Site/Project Identification: SWOPE PENNSAUKEN, NJ
Company: LAW Engineering + Environmental Serv.	P.O. #: 22000-0-0028	State (Location of site): NJ: [X] NY: [ ] Other:
Address: 14 Washington Rd. Building 1	Analysis Turnaround Time: Standard [X]	Regulatory Program: EPA
City: Princeton Jct State: NJ 08550	Rush Charges Authorized For: 2 Week [ ] 1 Week [ ] Other [ ]	
Phone: 609-936-0700 Fax: 609-936-1020		

ANALYSIS REQUESTED (ENTER "X" BELOW TO INDICATE REQUEST)

LAB USE ONLY
Project No:
Job No:

Sample Identification	Date	Time	Matrix	No. of Cont.	TCL VOC by OLM03.2 + TICs	Sample Numbers
GM-9	9/25/02	1215	WATER	3	3	
GM-15	↓	1410	↓	3	3	
MW-1	9/25/02	0840	↓	3	3	
MW-2	↓	1010	↓	3	3	
TB092502	9/25/02		↓	2	2	

Preservation Used: 1 = ICE, 2 = HCl, 3 = H_2SO_4, 4 = HNO_3, 5 = NaOH
6 = Other _____, 7 = Other _____

Soil:
Water: 2

Special Instructions: Any questions please contact Scott Horsnall @ 609-936-0700 Water Metals Filtered (Yes/No)? _____

Relinquished by	Company	Date / Time	Received by	Company
1) [signature]	LAW	9/25/02 1145	1) [signature]	JA
2) [signature]	JA	9/25/02 1146	2)	
3)		9/26/02 1015	3) [signature]	STL
4)			4)	

Laboratory Certifications: New Jersey (12028), New York (11452), Pennsylvania (68-522), Connecticut (PH-0200), Rhode Island (132).