102971

APPENDIX D

Laboratory Qualifications

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PERFORMANCE EVALUATION REPORT DATE: 8/ 2/3

WATER SUPPLY STUDY NUMBER #S028

LABORATORY R1004

ANALYTES	SAMPLE NUMBER	REPORTED VALUE		TRUE VALUE*	ACCEPTANCE LIMITS	PERFORMANCE EVALUATIONS
TRACE METALS IN MICROGRAMS PER LITER:						
ANTIMONY	2	33.6		35.0	27.6- 46.6	ACCEPTABLE
ARSENIC	1	131		129	109- 144	ACCEPTABLE
BARIUM	1	530		533	472- 574	ACCEPTABLE
BERYLLIUM	2	0.62		0.800	0.611-0.991	ACCEPTABLE
CADMIUM	1	7.68		7.73	6.37- 8.90	ACCEPTABLE
CHROMIUM	1	212		200	179- 223	ACCEPTABLE
COPPER	1	1020		950	896- 1020	ACCEPTABLE
LEAD	1	7.19		7.28	5.52- 9.41	ACCEPTABLE
MERCURY	1	7.29		7.14	5.54- 8.46	ACCEPTABLE
NICKEL	2	216		211	195- 231	ACCEPTABLE
SELENIUM	1	12.6	**	13.1	9.68- 14.6	ACCEPTABLE
SILVER	1	58.9		60.7	52.7- 68.9	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.
** SIGNIFICANT GENERAL METHOD BIAS IS ANTICIPATED FOR THIS RESULT.

PERFORMANCE EVALUATION REPORT DATE: 8/ 2/9

WATER SUPPLY STUDY NUMBER WS028

LABORATORY 21004

ANALYTES	SAMPLE NUMBER	REPORTED VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	PERFORMANCE EVALUATIONS
TRACE METALS IN MICROGRAMS PER LITER:					
THALLIUM	2	2.12	2.00	1.08- 2.94	ACCEPTABLE
NITRATE/NITRITE/FLUORIDE IN MILLIGRAMS PER LITER:					
NITRATE AS N	1	9.15	8.80	7.40- 10.4	ACCEPTABLE
NITRITE AS N	1	0.742	0.770	0.674-0.879	ACCEPTABLE
FLUORIDE	1	1.52	1.60	1.44- 1.76	ACCEPTABLE
INSECTICIDES IN MICROGRAMS PER LITER:					
CHLORDANE	3	2.92 **	3.77	2.04- 4.77	ACCEPTABLE
ENDRIN	1	0.154	0.163	0.107-0.233	ACCEPTABLE
HEPTACHLOR	4	0.142	0.142	.0398-0.220	ACCEPTABLE
HEPTACHLOR EPOXIDE	4	0.124	0.125	.0721-0.168	ACCEPTABLE
HEXACHLOROBENZENE	4	0.253	0.167	.0786-0.236	NOT ACCEPTABLE
HEXACHLOROCYCLOPENTADIENE	4	0.233	0.230	D.L.-0.402	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.
** SIGNIFICANT GENERAL METHOD BIAS IS ANTICIPATED FOR THIS RESULT.
D.L. STANDS FOR DETECTION LIMIT

PERFORMANCE EVALUATION REPORT DATE: 8/ 2/9

WATER SUPPLY STUDY NUMBER WS023

LABORATORY 81004

ANALYTES	SAMPLE NUMBER	REPORTED VALUE		TRUE VALUE*	ACCEPTANCE LIMITS	PERFORMANCE EVALUATIONS
INSECTICIDES IN MICROGRAMS PER LITER:						
LINDANE	1	0.504		0.633	0.378-0.661	ACCEPTABLE
METHOXYCHLOR	1	10.5		12.4	8.10- 15.9	ACCEPTABLE
TOXAPHENE	2	7.5	**	12.7	7.47- 15.7	ACCEPTABLE
HERBICIDES IN MICROGRAMS PER LITER:						
2,4-D	1	2.26		3.33	0.971- 5.26	ACCEPTABLE
2,4,5-TP (SILVEX)	1	1.13		1.75	0.532- 2.57	ACCEPTABLE
PAH'S IN MICROGRAMS PER LITER:						
BENZO(A)ANTHRACENE	1	12.6	**	16.5	4.31- 23.0	ACCEPTABLE
BENZO(B)FLUORANTHENE	1	8.38	**	18.4	1.54- 26.6	ACCEPTABLE
BENZO(G,H,I)PERYLENE	1		**	5.23	0.222- 7.65	NOT ACCEPTABLE
PHENANTHRENE	1	12.0	**	14.7	5.79- 19.2	ACCEPTABLE
NAPHTHALENE	1	6.60	**	8.33	1.80- 11.5	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.
** SIGNIFICANT GENERAL METHOD BIAS IS ANTICIPATED FOR THIS RESULT.

PERFORMANCE EVALUATION REPORT DATE: 6/ 2/9

WATER SUPPLY STUDY NUMBER WSC26

LABORATORY R1004

ANALYTES	SAMPLE NUMBER	REPORTED VALUE		TRUE VALUE*	ACCEPTANCE LIMITS	PERFORMANCE EVALUATIONS
ADIPATE/PHTHALATES IN MICROGRAMS PER LITER:						
BIS(2-ETHYLHEXYL)ADIPATE	1			18.5	D.L.- 32.5	NOT ACCEPTABLE
BIS(2-ETHYLHEXYL)PHTHAL.	1			24.6	.0582- 42.6	NOT ACCEPTABLE
DI-N-BUTYL PHTHALATE	1	13.6		20.1	0.376- 34.3	ACCEPTABLE
DIETHYL PHTHALATE	1	5.50	**	7.33	0.339- 11.4	ACCEPTABLE
TRIHALOMETHANES IN MICROGRAMS PER LITER:						
BROMODICHLOROMETHANE	1	20.1		18.7	15.0- 22.4	ACCEPTABLE
BROMOFORM	1	36.3		34.6	27.7- 41.5	ACCEPTABLE
CHLORODIBROMOMETHANE	1	29.3		27.1	21.7- 32.5	ACCEPTABLE
CHLOROFORM	1	15.2		14.2	11.4- 17.0	ACCEPTABLE
TOTAL TRIHALOMETHANE	1	100.9		94.6	75.7- 114	ACCEPTABLE
VOLATILE ORGANIC COMPOUNDS IN MICROGRAMS PER LITER:						
BENZENE	1	12.5		11.8	9.44- 14.2	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY
** SIGNIFICANT GENERAL METHOD BIAS IS ANTICIPATED FOR THIS RESULT.
D.L. STANDS FOR DETECTION LIMIT

PERFORMANCE EVALUATION REPORT DATE: 6/ 2/91

WATER SUPPLY STUDY NUMBER WS029

ABORATORY AI004

ANALYTES	SAMPLE NUMBER	REPORTED VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	PERFORMANCE EVALUATIONS
VOLATILE ORGANIC COMPOUNDS IN MICROGRAMS PER LITER:					
CARBON TETRACHLORIDE	1	13.1	12.2	9.76- 14.6	ACCEPTABLE
CHLOROBENZENE	2	15.2	14.6	11.7- 17.5	ACCEPTABLE
1,2 DICHLOROBENZENE	2	17.4	15.4	12.3- 18.5	ACCEPTABLE
1,4-DICHLOROBENZENE	1	13.3	12.5	10.0- 15.0	ACCEPTABLE
1,2-DICHLOROETHANE	1	7.14	6.95	4.17- 9.73	ACCEPTABLE
1,1-DICHLOROETHYLENE	1	5.69	4.72	2.83- 6.61	ACCEPTABLE
1,2 DICHLOROETHYLENE	2	16.9	13.0	10.4- 15.6	NOT ACCEPTABLE
T 1,2 DICHLOROETHYLENE	2	12.9	9.82	5.89- 13.7	ACCEPTABLE
1,2 DICHLOROPROPANE	2	7.53	7.37	4.42- 10.3	ACCEPTABLE
ETHYLBENZENE	2	12.8	11.6	9.28- 13.9	ACCEPTABLE
STYRENE	2	12.3	10.6	8.48- 12.7	ACCEPTABLE
TETRACHLOROETHYLENE	2	9.19	9.03	5.42- 12.6	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 9/ 2/9

WATER SUPPLY STUDY NUMBER WS028

LABORATORY NI034

ANALYTES	SAMPLE NUMBER	REPORTED VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	PERFORMANCE EVALUATIONS
VOLATILE ORGANIC COMPOUNDS IN MICROGRAMS PER LITER:					
TOLUENE	2	17.6	13.8	11.0- 16.6	NOT ACCEPTABLE
1,1,1-TRICHLOROETHANE	1	15.5	15.2	12.2- 18.2	ACCEPTABLE
TRICHLOROETHYLENE	1	4.08	4.32	2.59- 6.05	ACCEPTABLE
VINYL CHLORIDE	1	9.0	9.40	5.64- 13.2	ACCEPTABLE
TOTAL XYLENES	2	9.55	8.45	5.07- 11.8	ACCEPTABLE
BROMOBENZENE	3	18.0	13.4	10.7- 16.1	NOT ACCEPTABLE
N-BUTYLBENZENE	3	8.57	7.29	4.37- 10.2	ACCEPTABLE
4-CHLOROTOLUENE	3	14.8	12.3	9.84- 14.8	ACCEPTABLE
1,2DIBROMO3CHLOROPROPANE	4	1.45	3.55	2.13- 4.97	NOT ACCEPTABLE
ETHYLENE DIBROMIDE (EDB)	4	1.12	2.67	1.60- 3.74	NOT ACCEPTABLE
4-ISOPROPYLTOLUENE	3	16.6	13.9	11.1- 16.7	NOT ACCEPTABLE
1,1,1,2TETRACHLOROETHANE	3	9.16	8.23	4.94- 11.5	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 8/ 2

WATER SUPPLY STUDY NUMBER WS028

LABORATORY R1004

ANALYTES	SAMPLE NUMBER	REPORTED VALUE		TRUE VALUE*	ACCEPTANCE LIMITS	PERFORMANCE EVALUATIONS
VOLATILE ORGANIC COMPOUNDS IN MICROGRAMS PER LITER:						
1,2,4-TRICHLOROBENZENE	3	11.6		8.62	5.17- 12.1	ACCEPTABLE
1,2,3-TRICHLOROPROPANE	3	13.7		11.6	9.28- 13.9	ACCEPTABLE
1,2,4-TRIMETHYLBENZENE	3	11.3		9.46	5.68- 13.2	ACCEPTABLE
MISCELLANEOUS ANALYTES:						
RESIDUAL FREE CHLORINE (MILLIGRAMS PER LITER)	1	1.56	**	1.70	1.33- 1.66	ACCEPTABLE
TURBIDITY (NTU'S)	1	5.5	**	5.60	5.23- 6.27	ACCEPTABLE
TOTAL FILTERABLE RESIDUE (MILLIGRAMS PER LITER)	1	265		261	180- 385	ACCEPTABLE
CALCIUM (MG. CACO3/L)	1	131		130	119- 139	ACCEPTABLE
PH-UNITS	1	9.15	**	9.17	8.84- 9.32	ACCEPTABLE
ALKALINITY (MG. CACO3/L)	1	37.1	**	37.0	34.7- 41.9	ACCEPTABLE
CORROSIVITY (LANGELIER IND. AT 20C)	1	0.9		0.85	0.597- 1.18	ACCEPTABLE
SODIUM (MILLIGRAMS PER LITER)	1	17.1		17.0	15.2- 18.9	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY
** SIGNIFICANT GENERAL METHOD BIAS IS ANTICIPATED FOR THIS RESULT.

PERFORMANCE EVALUATION REPORT DATE: 8/ 2/91

WATER SUPPLY STUDY NUMBER WS026

LABORATORY AI004

ANALYTES	SAMPLE NUMBER	REPORTED VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	PERFORMANCE EVALUATIONS
MISCELLANEOUS ANALYTES:					
SULFATE (MILLIGRAMS PER LITER)	1	43.6	43.0	37.7- 47.2	ACCEPTABLE
TOTAL CYANIDE (MILLIGRAMS PER LITER)	1	0.419	.460	0.312-0.567	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/21/91

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: RI004

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
TRACE METALS IN MICROGRAMS PER LITER:						
ALUMINUM	1	887	870	720- 999	755- 964	ACCEPTABLE
	2	3230	3200	2730- 3630	2840- 3510	ACCEPTABLE
ARSENIC	1	63.6	69.9	55.5- 82.8	58.9- 79.4	ACCEPTABLE
	2	196	200	158- 234	168- 225	ACCEPTABLE
BERYLLIUM	1	1.50	11.1	7.73- 14.7	8.63- 13.8	NOT ACCEPTABLE
	2	134	130	104- 159	111- 152	ACCEPTABLE
CADMIUM	1	5.04	5.07	3.42- 6.82	3.85- 6.40	ACCEPTABLE
	2	189	190	161- 218	168- 211	ACCEPTABLE
COBALT	1	823	815	706- 915	733- 888	ACCEPTABLE
	2	174	160	154- 205	161- 198	ACCEPTABLE
CHROMIUM	1	77.2	74.0	56.7- 90.2	60.8- 86.0	ACCEPTABLE
	2	427	410	334- 477	352- 459	ACCEPTABLE
COPPER	1	44.2	43.0	34.9- 50.2	36.8- 48.3	ACCEPTABLE
	2	794	730	656- 817	676- 797	ACCEPTABLE
IRON	1	334	340	293- 391	305- 379	ACCEPTABLE
	2	986	1000	887- 1140	918- 1110	ACCEPTABLE
MERCURY	1	0.640	0.543	0.246-0.903	0.329-0.820	ACCEPTABLE
	2	3.93	3.40	2.54- 4.41	2.78- 4.18	ACCEPTABLE
MANGANESE	1	433	420	385- 460	394- 451	ACCEPTABLE
	2	932	920	850- 1010	869- 986	ACCEPTABLE
NICKEL	1	1670	1600	1420- 1770	1460- 1720	ACCEPTABLE
	2	432	430	383- 485	396- 472	ACCEPTABLE
LEAD	1	321	320	271- 369	283- 357	ACCEPTABLE
	2	46.3	47.9	38.3- 58.3	40.8- 55.8	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/21

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: RI004

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
TRACE METALS IN MICROGRAMS PER LITER:						
SELENIUM	1	9.41	10.0	5.92- 13.1	6.82- 12.2	ACCEPTABLE
	2	79.3	86.0	60.7- 105	66.1- 99.1	ACCEPTABLE
VANADIUM	1	1940	2000	1760- 2240	1820- 2180	ACCEPTABLE
	2	4510	4600	4130- 5160	4260- 5020	ACCEPTABLE
ZINC	1	1910	1900	1670- 2110	1720- 2060	ACCEPTABLE
	2	114	110	88.5- 133	94.1- 128	ACCEPTABLE
ANTIMONY	3	15.3	17.1	8.31- 26.0	10.5- 23.8	ACCEPTABLE
SILVER	3	0.69	0.806	0.460- 1.16	0.550- 1.07	ACCEPTABLE
	4	6.95	6.80	5.14- 8.34	5.54- 7.94	ACCEPTABLE
THALLIUM	3	5.97	6.75	4.11- 9.43	4.81- 8.73	ACCEPTA
	4	87.1	97.1	76.6- 118	81.9- 112	ACCEPTA
MOLYBDENUM	3	25.5	27.3	17.0- 36.6	19.8- 33.9	ACCEPTABLE
	4	3.25	4.01	1.21- 6.99	2.03- 6.17	ACCEPTABLE
TITANIUM	3	180	190	160- 222	168- 214	ACCEPTABLE
	4	37	39.9	30.8- 47.5	33.0- 45.2	ACCEPTABLE
MINERALS IN MILLIGRAMS PER LITER: (EXCEPT AS NOTED)						
PH-UNITS	3	8.85	8.80	8.46- 9.24	8.55- 9.14	ACCEPTABLE
	4	5.59	5.52	5.42- 5.66	5.45- 5.64	ACCEPTABLE
SPEC. COND.	1	140	119	104- 128	107- 125	NOT ACCEPTABLE
(UMHOS/CM AT 25 C)	2	984	901	799- 936	822- 963	CHECK FOR ERROR
TDS AT 180 C	1	60.5	59.1	31.9- 90.0	39.2- 82.7	ACCEPTABLE
	2	521	521	387- 671	422- 636	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/21/91

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: RI004

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
MINERALS IN MILLIGRAMS PER LITER: (EXCEPT AS NOTED)						
TOTAL HARDNESS	1	19	18.5	14.7- 22.4	15.6- 21.5	ACCEPTABLE
(AS CACO3)	2	239	253	233- 270	237- 266	ACCEPTABLE
CALCIUM	1	1.26	1.30	0.909- 1.61	0.997- 1.52	ACCEPTABLE
	2	64.6	71.0	61.8- 80.3	64.1- 77.9	ACCEPTABLE
MAGNESIUM	1	3.84	3.70	3.16- 4.25	3.29- 4.11	ACCEPTABLE
	2	16.8	18.5	16.0- 21.0	16.6- 20.4	ACCEPTABLE
SODIUM	1	9.19	9.44	8.29- 10.8	8.60- 10.5	ACCEPTABLE
	2	53.4	55.8	49.3- 61.8	50.9- 60.3	ACCEPTABLE
POTASSIUM	1	8.7	8.95	7.43- 10.3	7.80- 9.97	ACCEPTABLE
	2	28	28.9	24.8- 33.2	25.9- 32.1	ACCEPTABLE
TOTAL ALKALINITY	1	20	18.2	14.7- 23.0	15.7- 22.0	ACCEPTABLE
AS CACO3)	2	116	112	96.7- 116	99.1- 114	CHECK FOR ERROR
CHLORIDE	1	14.4	13.4	10.6- 15.5	11.2- 14.9	ACCEPTABLE
	2	205	181	164- 201	169- 196	NOT ACCEPTABLE
FLUORIDE	1	0.691	0.750	0.636-0.852	0.664-0.825	ACCEPTABLE
	2	2.96	2.90	2.38- 3.27	2.50- 3.16	ACCEPTABLE
SULFATE	1	9.99	11.0	8.35- 13.4	8.98- 12.8	ACCEPTABLE
	2	41.7	35.5	28.0- 41.9	29.8- 40.1	CHECK FOR ERROR
NUTRIENTS IN MILLIGRAMS PER LITER:						
AMMONIA-NITROGEN	1	20.0	18.0	14.4- 21.3	15.2- 20.4	ACCEPTABLE
	2	4.07	4.20	3.30- 5.09	3.51- 4.88	ACCEPTABLE
NITRATE-NITROGEN	1	4.52	8.00	6.47- 9.52	6.83- 9.15	NOT ACCEPTABLE
	2	5.10	10.0	8.09- 11.9	8.55- 11.4	NOT ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/21

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: RI004

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
NUTRIENTS IN MILLIGRAMS PER LITER:						
ORTHOPHOSPHATE	1	1.08	1.40	1.15- 1.63	1.20- 1.57	NOT ACCEPTABLE
	2	0.26	0.320	0.251-0.385	0.267-0.369	CHECK FOR ERROR
TOTAL PHOSPHORUS	3	2.80	3.60	2.84- 4.28	3.02- 4.11	NOT ACCEPTABLE
	4	1.48	1.80	1.38- 2.13	1.47- 2.04	ACCEPTABLE
DEMANDS IN MILLIGRAMS PER LITER:						
COD	1	46.0	46.6	32.5- 57.1	35.6- 54.0	ACCEPTABLE
	2	65.9	65.4	49.3- 75.8	52.7- 72.5	ACCEPTABLE
PCB'S IN MICROGRAMS PER LITER:						
PCB-AROCLOR 1232	1	2.05	3.77	1.93- 5.06	2.33- 4.66	CHECK FOR ERROR
PCB-AROCLOR 1254	2	6.97	8.37	3.85- 11.0	4.76- 10.1	ACCEPTA.
PCB'S IN OIL IN MILLIGRAMS PER KILOGRAM:						
PCB IN OIL- 1016/1242	1	23.5	32.4	5.93- 45.6	11.0- 40.5	ACCEPTABLE
PCB IN OIL- 1260	2	18.4	13.6	2.92- 29.5	6.25- 26.0	ACCEPTABLE
PESTICIDES IN MICROGRAMS PER LITER:						
CHLORDANE	3	0.869	1.13	0.543- 1.49	0.661- 1.37	ACCEPTABLE
	4	7.32	8.88	4.60- 11.5	5.48- 10.6	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/21/91

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: RI004

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
PESTICIDES IN MICROGRAMS PER LITER:						
ALDRIN	1	0.172	0.227	.0496-0.315	.0828-0.282	ACCEPTABLE
	2	0.448	0.606	0.134-0.891	0.229-0.797	ACCEPTABLE
DIELDRIN	1	0.180	0.208	0.104-0.300	0.129-0.275	ACCEPTABLE
	2	0.400	0.467	0.269-0.650	0.317-0.603	ACCEPTABLE
DDD	1	0.164	0.157	.0504-0.272	.0787-0.244	ACCEPTABLE
	2	0.732	0.882	0.436- 1.13	0.523- 1.04	ACCEPTABLE
DDE	1	0.202	0.183	.0715-0.274	.0974-0.249	ACCEPTABLE
	2	0.361	0.417	0.170-0.626	0.227-0.569	ACCEPTABLE
DDT	1	0.218	0.217	.0782-0.352	0.113-0.317	ACCEPTABLE
	2	0.750	0.780	0.383- 1.13	0.476- 1.04	ACCEPTABLE
HEPTACHLOR	1	0.092	0.119	.0284-0.174	.0466-0.155	ACCEPTABLE
	2	0.449	0.587	0.214-0.796	0.287-0.723	ACCEPTABLE
HEPTACHLOR EPOXIDE	1	0.092	0.108	.0568-0.148	.0682-0.137	ACCEPTABLE
	2	0.295	0.350	0.192-0.490	0.229-0.453	ACCEPTABLE
VOLATILE HALOCARBONS IN MICROGRAMS PER LITER:						
1,2 DICHLOROETHANE	1	17.2	17.2	10.5- 23.1	12.1- 21.5	ACCEPTABLE
	2	38.0	38.9	26.8- 52.3	30.0- 49.1	ACCEPTABLE
CHLOROFORM	1	13.5	13.3	8.35- 17.4	9.49- 16.3	ACCEPTABLE
	2	63.3	64.4	41.1- 82.8	46.4- 77.6	ACCEPTABLE
1,1,1 TRICHLOROETHANE	1	13.7	14.3	8.15- 18.5	9.44- 17.2	ACCEPTABLE
	2	36.5	36.6	21.5- 48.6	24.9- 45.2	ACCEPTABLE
TRICHLOROETHENE	1	13.1	13.9	8.68- 18.6	9.94- 17.3	ACCEPTABLE
	2	37.8	38.9	25.9- 50.2	29.0- 47.1	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/21/81

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: RI004

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
VOLATILE HALOCARBONS IN MICROGRAMS PER LITER:						
CARBONTETRACHLORIDE	1	11.2	11.7	6.46- 16.2	7.68- 15.0	ACCEPTABLE
	2	51.0	46.6	28.6- 64.2	33.0- 59.7	ACCEPTABLE
TETRACHLOROETHENE	1	15.5	15.1	9.27- 20.4	10.7- 19.0	ACCEPTABLE
	2	66.7	63.9	40.5- 85.0	46.2- 79.3	ACCEPTABLE
BROMODICHLOROMETHANE	1	14.6	16.1	10.5- 20.7	11.8- 19.4	ACCEPTABLE
	2	50.1	53.8	37.0- 70.5	41.3- 66.2	ACCEPTABLE
DIBROMOCHLOROMETHANE	1	14.3	15.2	9.76- 20.6	11.1- 19.2	ACCEPTABLE
	2	51.7	52.5	36.0- 69.7	40.3- 65.4	ACCEPTABLE
BROMOFORM	1	15.8	17.8	9.79- 25.1	11.7- 23.1	ACCEPTABLE
	2	50.0	54.0	32.8- 76.2	38.3- 70.7	ACCEPTABLE
METHYLENE CHLORIDE	1	21.8	17.5	9.11- 25.1	11.1- 23.1	ACCEPTA
	2	51.7	54.6	29.0- 77.3	35.1- 71.2	ACCEPTA
CHLOROBENZENE	1	15.7	16.5	11.1- 21.6	12.4- 20.3	ACCEPTABLE
	2	66.5	63.4	45.5- 90.2	51.2- 84.5	ACCEPTABLE
VOLATILE AROMATICS IN MICROGRAMS PER LITER:						
BENZENE	1	12.6	11.8	7.72- 16.1	8.78- 15.0	ACCEPTABLE
	2	46.6	46.5	31.3- 61.0	35.1- 57.2	ACCEPTABLE
ETHYLBENZENE	1	16.7	15.3	9.78- 20.0	11.1- 18.7	ACCEPTABLE
	2	71.4	66.2	43.8- 86.2	49.2- 80.8	ACCEPTABLE
TOLUENE	1	21.0	18.9	12.8- 24.6	14.3- 23.1	ACCEPTABLE
	2	54.4	52.7	39.4- 65.9	42.7- 62.6	ACCEPTABLE
1,2-DICHLOROBENZENE	1	18.6	15.5	10.9- 20.4	12.1- 19.2	ACCEPTABLE
	2	83.1	71.8	49.4- 90.9	54.7- 85.6	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

Ceimic Corp.

PERFORMANCE EVALUATION REPORT DATE: 6/21/91

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: RIC04

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
VOLATILE AROMATICS IN MICROGRAMS PER LITER:						
1,3-DICHLOROBENZENE	1	15.8	14.3	10.5- 18.3	11.5- 17.4	ACCEPTABLE
	2	53.5	47.2	31.8- 60.3	35.4- 56.6	ACCEPTABLE
1,4-DICHLOROBENZENE	1	20.0	17.2	11.4- 23.0	12.9- 21.5	ACCEPTABLE
	2	67.4	55.4	38.1- 71.5	42.3- 67.2	CHECK FOR ERROR
MISCELLANEOUS PARAMETERS:						
TOTAL CYANIDE	1	0.020	0.020	D.L.-.0352	.0020-.0304	ACCEPTABLE
(IN MG/L)	2	0.577	0.530	0.365-0.676	0.404-0.637	ACCEPTABLE
NON-FILTERABLE RESIDUE	1	48.3	63.3	46.1- 67.2	48.7- 64.5	CHECK FOR ERROR
(IN MG/L)	2	18.3	23.9	14.8- 26.5	16.3- 25.0	ACCEPTABLE
OIL AND GREASE	1	34.0	13.0	6.48- 17.7	7.88- 16.3	NOT ACCEPTABLE
(IN MG/L)	2	43.3	17.0	9.07- 22.1	10.7- 20.5	NOT ACCEPTABLE
TOTAL PHENOLICS	1	0.499	0.455	0.195-0.714	0.261-0.648	ACCEPTABLE
(IN MG/L)	2	0.019	.0146	.0025-.0266	.0056-.0236	ACCEPTABLE
TOTAL RESIDUAL CHLORINE	1	1.72	2.00	1.27- 2.25	1.40- 2.12	ACCEPTABLE
(IN MG/L)	2	0.105	0.110	D.L.-0.246	.0099-0.210	ACCEPTABLE

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.
D.L. STANDS FOR DETECTION LIMIT

DH 11/26/91

REGION 1
ORGANIC PERFORMANCE EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT
FOR QB 4 FY 91

LABORATORY: Calmic Corporation (RI)
PERFORMANCE: ACCEPTABLE - No Response Required
RANK: Above = 8 Same = 0 Below = 16

% SCORE: 93.2
REPORT DATE: 10/27/91
MATRIX: WATER

COMPOUND	TOLERANCE INTERVALS WARNING LOWER	WARNING UPPER	ACTION LOWER	ACTION UPPER	LABORATORY DATA CONC	Q	#LABS MIS-CNT	PROGRAM DATA #LABS NOT-ID	#LABS ID-CPD	TOTAL #LABS
TCL VOLATILE										
CHLOROMETHANE	28	120	15	130	75		1	0	48	48
1,1-DICHLOROETHENE	67	110	61	120	99		4	0	48	48
DIBROMOCHLOROMETHANE	65	92	61	97	84		3	0	48	48
BENZENE	56	78	53	82	68		3	0	48	48
BROMOFORM	NU	NU	NU	NU	10		0	0	48	48
4-METHYL-2-PENTANONE	32	74	25	81	75	S	2	0	48	48
2-HEXANONE	250	480	210	510	480		10	1	47	48
1,1,2,2-TETRACHLOROETHANE	56	78	53	81	75		3	0	48	48
CHLOROBENZENE	30	38	29	39	37		4	0	48	48
STYRENE	160	220	160	230	190		3	0	48	48
XYLENES (TOTAL)	120	180	110	200	180		5	0	48	48
TCL SEMIVOLATILE										
4-METHYLPHENOL	22	38	19	47	27		3	3	45	48
ISOPHORONE	12	21	11	23	15		2	0	48	48
1,2,4-TRICHLOROBENZENE	23	43	20	54	39		3	0	48	48
NAPHTHALENE	13	22	11	28	18		7	2	46	48
4-CHLORO-3-METHYL PHENOL	18	26	17	30	23		3	1	47	48
2-METHYLNAPHTHALENE	12	20	11	21	18		3	1	47	48
HEXACHLOROCYCLOPENTADIENE	NU	NU	NU	NU	21		0	11	37	48
2-CHLORONAPHTHALENE	16	22	13	26	19		1	0	48	48
ACENAPHTHENE	50	71	47	84	71		6	0	48	48
2,4-DINITROTOLUENE	61	90	57	110	72		4	1	47	48
PHENANTHRENE	32	46	30	48	44		3	0	48	48
DI-N-BUTYLPHTHALATE	13	20	12	21	15		10	1	47	48
PYRENE	36	53	33	63	41		2	0	48	48
BENZO(B)FLUORANTHENE	17	30	15	31	25		5	0	48	48
BENZO(G,H,I)PERYLENE	15	35	12	38	28		3	0	48	48
TCL PESTICIDES										
BETA-BHC	0.094	0.2	0.078	0.21	0.09	S	5	6	42	48
GAMMA-BHC (LINDANE)	0.49	0.86	0.44	0.92	0.6		5	1	47	48
HEPTACHLOR	0.4	0.58	0.37	0.6	0.44		7	1	47	48
ALDRIN	0.23	0.41	0.2	0.43	0.24		2	1	47	48
DIELDRIN	0.15	0.23	0.14	0.24	0.13	X	7	4	44	48
4,4'-DDE	0.42	0.63	0.39	0.66	0.45		6	1	47	48
ENDRIN	0.71	1	0.66	1.1	0.71		4	1	47	48
ENDOSULFAN II	0.1	0.16	0.1	0.2	0.079		1	6	42	48
ENDOSULFAN SULFATE	0.39	0.65	0.35	0.69	0.4		3	3	45	48
4,4'-DDT	0.6	0.89	0.56	0.94	0.66		6	1	47	48
METHOXYCHLOR	1.3	2.4	1.4	2.5	1.5		6	1	47	48
ALPHA-CHLORDANE	0.72	1.1	0.66	1.2	0.72		3	5	43	48
GAMMA-CHLORDANE	0.44	0.62	0.41	0.65	0.4	X	7	2	46	48
NON-TCL VOLATILE										
ACETONITRILE					0	NR		31	17	48

AR301456

DH 11/26/91

REGION 1
ORGANIC PERFORMANCE EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT
FOR CB 4 FY 91

LABORATORY: Ceimic Corporation (RI)
PERFORMANCE: ACCEPTABLE - No Response Required
RANK: Above = 8 Same = 0 Below = 16

% SCORE: 93.2
REPORT DATE: 10/27/9
MATRIX: WATER

COMPOUND	TOLERANCE INTERVALS WARNING LOWER	WARNING UPPER	ACTION LOWER	ACTION UPPER	LABORATORY DATA CONC	Q	#LABS MIS-QNT	PROGRAM DATA #LABS NOT-ID	#LABS ID-CPD	TOTAL #LABS
TCL VOLATILE										
CHLOROMETHANE	28	120	15	130	75		1	0	48	48
1,1-DICHLOROETHENE	67	110	61	120	99		4	0	48	48
DIBROMOCHLOROMETHANE	65	92	61	97	84		5	0	48	48
BENZENE	56	78	53	82	68		3	0	48	48
BROMOFORM	NU	NU	NU	NU	10		0	0	48	48
4-METHYL-2-PENTANONE	32	74	25	81	75	$	2	0	48	48
2-HEXANONE	250	480	210	510	480		10	1	47	48
1,1,2,2-TETRACHLOROETHANE	56	78	53	81	75		3	0	48	48
CHLOROBENZENE	30	38	29	39	37		4	0	48	48
STYRENE	160	220	160	230	190		3	0	48	48
XYLENES (TOTAL)	120	180	110	200	180		5	0	48	48
TCL SEMIVOLATILE										
4-METHYLPHENOL	22	38	19	47	27		3	3	45	48
ISOPHORONE	12	21	11	23	15		2	0	48	48
1,2,4-TRICHLOROBENZENE	23	43	20	54	39		3	0	48	48
NAPHTHALENE	13	22	11	28	18		7	2	46	48
4-CHLORO-3-METHYL PHENOL	18	26	17	30	23		3	1	47	48
2-METHYLNAPHTHALENE	12	20	11	21	18		3	1	47	48
HEXACHLOROCYCLOPENTADIENE	NU	NU	NU	NU	21		0	11	37	48
2-CHLORONAPHTHALENE	14	22	13	26	19		1	0	48	48
ACENAPHTHENE	50	71	47	84	71		6	0	48	48
2,4-DINITROTOLUENE	61	90	57	110	72		4	1	47	48
PHENANTHRENE	32	46	30	48	44		3	0	48	48
DI-N-BUTYLPHTHALATE	13	20	12	21	15		10	1	47	48
PYRENE	36	53	33	63	41		2	0	48	48
BENZO(B)FLUORANTHENE	17	30	15	31	25		5	0	48	48
BENZO(G,H,I)PERYLENE	15	35	12	38	28		3	0	48	48
TCL PESTICIDES										
BETA-BHC	0.094	0.2	0.078	0.21	0.09	$	5	6	42	48
GAMMA-BHC (LINDANE)	0.49	0.86	0.44	0.92	0.6		5	1	47	48
HEPTACHLOR	0.4	0.58	0.37	0.6	0.44		7	1	47	48
ALDRIN	0.23	0.41	0.2	0.43	0.24		2	1	47	48
DIELDRIN	0.15	0.23	0.14	0.24	0.13	X	7	4	44	48
4,4'-DDE	0.42	0.63	0.39	0.66	0.45		6	1	47	48
ENDRIN	0.71	1	0.66	1.1	0.71		4	1	47	48
ENDOSULFAN II	0.1	0.16	0.1	0.2	0.079		1	6	42	48
ENDOSULFAN SULFATE	0.39	0.65	0.35	0.69	0.4		3	3	45	48
4,4'-DDT	0.6	0.89	0.56	0.94	0.66		6	1	47	48
METHOXYCHLOR	1.5	2.4	1.4	2.5	1.5		6	1	47	48
ALPHA-CHLORDANE	0.72	1.1	0.66	1.2	0.72		3	5	43	48
GAMMA-CHLORDANE	0.44	0.62	0.41	0.65	0.4	X	7	2	46	48
NON-TCL VOLATILE										
ACETONITRILE					0	NR		31	17	48

AR301457

INORGANIC PERFORMANCE EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT
FOR QB 4 FY 91

LABORATORY NAME: Ceimic Corporation (RI) [N1] (CEINIC)
PERFORMANCE LEVEL: UNACCEPTABLE, Corrective Actions Mandatory
LABORATORY RANK: Above = 15 Same = 0 Below = 1

% Score: 73.4
REPORT DATE: 9/20/1991
MATRIX: SOIL 1

ELEMENT NAME	95 % CI		LAB RESULTS		PROGRAM DATA					
	LOWER	UPPER	REPORTED VALUE	QUALIFIER CODE	#LABS NOT-ID	#LABS MIS-QUANT	#LABS FALSE POS	#LABS MSPK OUT	#LABS DUP OUT	TOTAL #LABS
ALUMINUM	2680	4980	3350		0	0	0	0	0	17
ANTIMONY	12.0	34.3	27.6		1	1	0	14	0	17
ARSENIC	447	661	579		0	0	0	0	1	17
BARIUM	40.0	818	583	E	0	0	0	16	6	17
BERYLLIUM	1.0	3.8	1		4	1	0	1	0	17
CADMIUM	20.2	25.5	26.5	X	0	4	0	1	0	17
CALCIUM	34801	43101	37300	E	0	1	0	0	0	17
CHROMIUM	168	213	191	E	0	0	0	0	0	17
COBALT	17.0	49.2	29.6		0	0	0	0	3	
COPPER	1010	1270	1100	E	0	0	0	0	0	
IRON	84401	123001	94200	E	0	0	0	0	0	1
LEAD	5610	7230	6140		0	1	0	0	0	17
MAGNESIUM	4850	6380	5440	E	0	0	0	0	0	17
MANGANESE	6670	8700	7950		0	0	0	0	0	17
MERCURY	0.42	0.73	0.56		1	1	0	2	2	17
NICKEL	15.0	21.6	18.2		0	0	0	0	0	17
POTASSIUM	1000.0	1660	1330		0	0	0	0	0	17
SELENIUM	1.0	13.0	9.3	UW X	4	4	0	5	5	17
SILVER	16.3	34.8	23.9		0	2	0	3	0	17
SODIUM	d	d	3440	#	0	0	1	0	0	17
THALLIUM	6.8	15.8	7	S	1	2	0	8	0	17
VANADIUM	226	296	256	E	0	0	0	0	0	17
ZINC	4060	5810	5100		0	1	0	0	0	17

OF ELEMENTS NOT-IDENTIFIED: 1
OF ELEMENTS MIS-QUANTIFIED: 1
OF FALSE POSITIVES: 1

OF MATRIX SPIKES OUT: 4
SOIL : Sb, Ba, Ag, Tl

OF DUPLICATES OUT: 2
SOIL : Ba, Se

INORGANIC PERFORMANCE EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT
FOR QB 4 FY 91

LABORATORY NAME: Ceimic Corporation (R1) [N1] (CEIMIC)
PERFORMANCE LEVEL: UNACCEPTABLE, Corrective Actions Mandatory
LABORATORY RANK: Above = 15 Same = 0 Below = 1

% Score: 73.4
REPORT DATE: 9/20/1991
MATRIX: WATER 1

ELEMENT NAME	95 % CI LOWER	95 % CI UPPER	LAB RESULTS REPORTED VALUE	LAB RESULTS QUALIFIER CODE	PROGRAM DATA #LABS NOT-ID	#LABS MIS-QUANT	#LABS FALSE POS	#LABS MSPK OUT	#LABS DUP OUT	TOTAL #LABS
ALUMINUM	915	1140	968		0	0	0	0	0	17
ANTIMONY	91.7	138	125		0	0	0	2	0	17
ARSENIC	56.4	69.9	62.7		0	3	0	2	0	17
BARIUM	200.0	223	192	B	0	0	0	0	0	17
BERYLLIUM	23.6	27.6	25		0	4	0	0	0	17
CADMIUM	12.1	17.6	14		0	1	0	1	0	17
CALCIUM	c	c	77	U	0	0	0	0	0	17
CHROMIUM	142	162	148		0	2	0	0	0	17
COBALT	50.0	55.0	47	B	0	0	0	0	0	17
COPPER	c	c	16	U	0	0	1	0	0	17
I	4610	5590	4850		0	0	0	0	0	17
	7.8	14.6	10.6		0	4	0	0	1	17
MESIUM	c	c	118	U	0	0	0	0	0	17
MANGANESE	81.6	100	85		0	1	0	0	0	17
MERCURY	8.3	22.0	14.2		0	4	0	0	1	17
NICKEL	c	c	27	U	0	0	0	0	0	17
POTASSIUM	16000	18300	16800		0	2	0	0	0	17
SELENIUM	8.0	13.0	10.3		0	1	0	1	0	17
SILVER	43.1	56.5	48		0	0	0	2	0	17
SODIUM	15700	18400	16300		0	0	0	0	0	17
THALLIUM	c	c	1	U	0	0	0	1	0	17
VANADIUM	98.3	127	107		0	0	0	0	0	17
ZINC	20.0	23.1	12	U	6	1	0	0	0	17

OF ELEMENTS NOT-IDENTIFIED: 0
OF ELEMENTS MIS-QUANTIFIED: 0
OF FALSE POSITIVES: 0

OF MATRIX SPIKES OUT: 2
WATER : Sb, Ag

OF DUPLICATES OUT: 0
ER :

AR301459

INORGANIC PERFORMANCE EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT
FOR QB 4 FY 91

LABORATORY NAME: Ceimic Corporation (RI) [N1] (CEIMIC)
PERFORMANCE LEVEL: UNACCEPTABLE, Corrective Actions Mandatory
LABORATORY RANK: Above = 15 Same = 0 Below = 1

% Score: 73.4
REPORT DATE: 9/20/1991
MATRIX: WATER 2

ELEMENT NAME	95 % CI		LAB RESULTS REPORTED VALUE	QUALIFIER CODE	#LABS NOT-ID	#LABS MIS-QUANT	PROGRAM DATA #LABS FALSE POS	#LABS MSPK OUT	#LABS DUP OUT	TOTAL #LABS
	LOWER	UPPER								
ALUMINUM	c	c	89	B	0	0	0	0	0	17
ANTIMONY	430	534	429	X	0	2	0	2	0	17
ARSENIC	14.6	20.9	16.6		0	1	0	2	0	17
BARIUM	c	c	5	U	0	0	0	0	0	17
BERYLLIUM	177	208	184		0	3	0	0	0	17
CADMIUM	11.5	17.2	13		0	0	0	1	0	17
CALCIUM	24000	29000	24500		0	0	0	0	0	17
CHROMIUM	69.2	83.2	66	X	0	2	0	0	0	17
COBALT	89.4	103	90	S	0	0	0	0	0	17
COPPER	194	231	203		0	1	0	0	0	17
IRON	460	549	468		0	0	0	0	0	17
LEAD	77.5	123	101		0	4	0	0	1	17
MAGNESIUM	18100	21100	18800		0	0	0	0	0	17
MANGANESE	c	c	2	U	0	0	0	0	0	17
MERCURY	c	c	0.3	#	0	0	7	0	1	17
NICKEL	90.3	105	94		0	4	0	0	0	17
POTASSIUM	c	c	810	U	0	0	0	0	0	17
SELENIUM	19.4	30.0	26.5		0	0	0	1	0	17
SILVER	16.5	21.4	23	X	0	2	0	2	0	17
SODIUM	c	c	118	U	0	0	0	0	0	17
THALLIUM	15.3	24.8	17.8		0	0	0	1	0	17
VANADIUM	c	c	7	U	0	0	0	0	0	17
ZINC	214	268	212	X	0	2	0	0	0	17

OF ELEMENTS NOT-IDENTIFIED: 0
OF ELEMENTS MIS-QUANTIFIED: 4
OF FALSE POSITIVES: 1

OF MATRIX SPIKES OUT: 2
WATER : Sb, Ag

OF DUPLICATES OUT: 0
WATER :

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

November 19, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Performance Evaluation Sample Results for IFB Solicitations D101168R1 and D101169R1

FROM: Angelo Carasea, CLP National Organic Program Manager
Hazardous Site Evaluation Division (OS-230)

TO: Bidders for IFB Solicitations D101168R1 and D110169R1

Attached are your performance evaluation sample results for IFB solicitations D101168R1 and D101169R1. Acceptable performance is defined as follows for each water and soil performance evaluation sample analyzed:

Preliminary Score (Total of I and II)	Greater than or equal to 1050 points
Final Score (Total of I, II, III and IV)	Greater than or equal to 1500 points

We are in the process of conducting pre-award on-site laboratory visits to those bidders who performed acceptably on the performance evaluation samples and whose price has been determined to be fair and reasonable.

Questions concerning your results should be submitted in writing to:

Marian Bernd
Contracting Officer
USEPA
Contracts Management Division (MD-33)
Alexander Drive
Research Triangle Park, NC 27711

Thank you for participating in the solicitations.

Scoring Qualifier Explanation

Organic Preaward

IFB D101168R1 / D101169R1

& Identification error. Points deducted.

X Quantification error. Points deducted.

$ Concentration outside of warning limit. Points were not deducted.

ORGANIC PREAWARD EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT

LABORATORY: Celmic Corporation (RI)

REPORT DATE: 10/12/91
MATRIX: WATER

COMPOUND	TOLERANCE INTERVALS WARNING LOWER	WARNING UPPER	ACTION LOWER	ACTION UPPER	LABORATORY DATA CONC	Q
TCL VOLATILE						
CHLOROETHANE	59	87	55	91	77	
CHLOROFORM	34	45	32	47	42	
CARBON TETRACHLORIDE	95	140	88	150	130	
1,2-DICHLOROPROPANE	67	89	64	92	80	
TRICHLOROETHENE	36	49	34	50	44	
BENZENE	52	67	50	69	60	
BROMOFORM	30	44	28	46	38	
TOLUENE	68	90	64	93	79	
1,1,2,2-TETRACHLOROETHANE	81	110	77	110	92	
CHLOROBENZENE	51	67	49	69	62	
TCL SEMIVOLATILE						
NITROBENZENE	19	29	18	30	25	
2,4-DIMETHYLPHENOL	15	27	13	34	15	
NAPHTHALENE	10	15	10	15	12	
4-CHLORO-3-METHYL PHENOL	18	23	17	26	20	
DIMETHYL PHTHALATE	11	16	10	17	13	
2,6-DINITROTOLUENE	12	19	11	20	15	
ACENAPHTHENE	14	19	13	20	17	
2,4-DINITROPHENOL	NU	NU	NU	NU	11	
4-DINITROTOLUENE	15	24	14	26	20	
NTACHLOROPHENOL	NU	NU	NU	NU	32	
NANTHRENE	11	16	10	17	13	
NZO(B)FLUORANTHENE	13	23	12	24	16	
BENZO(K)FLUORANTHENE	14	24	12	25	15	
BENZO(G,H,I)PERYLENE	16	27	14	28	17	
TCL PESTICIDES						
BETA-BHC	0.18	0.3	0.16	0.31	0.19	
HEPTACHLOR EPOXIDE	0.19	0.25	0.18	0.26	0.22	
DIELDRIN	0.27	0.41	0.25	0.43	0.3	
4,4'-DDT	0.39	0.7	0.34	0.74	0.36	S
ALPHA-CHLORDANE	0.2	0.3	0.19	0.31	0.26	
NON-TCL VOLATILE						
METHANE,DICHLORO-DIFLUORO-					17	
NON-TCL SEMIVOLATILE						
ETHANE,1,2-DIBROMO-TETRAFLUORO-					0	NR
URETHANE					18	
TCL VOLATILE (Contaminants)						
METHYLENE CHLORIDE					4	

AR301463

ORGANIC PREAWARD EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT

LABORATORY: Ceimic Corporation (RI)

REPORT DATE: 10/12/91
MATRIX: WATER

COMPOUND	TOLERANCE INTERVALS WARNING LOWER	WARNING UPPER	ACTION LOWER	ACTION UPPER	LABORATORY DATA CONC	Q
TCL SEMIVOLATILE (Contaminants)						
BIS(2-ETHYLHEXYL)PHTHALATE					1	
NON-TCL VOLATILE (Contaminants)						
2-PROPANOL					74	
NON-TCL SEMIVOLATILE (Contaminants)						
UNKNOWN					2	

OF TCL COMPOUNDS NOT-IDENTIFIED: 0
OF TCL COMPOUNDS MIS-QUANTIFIED: 0
OF TCL CONTAMINANTS: 0

OF NON-TCL COMPOUNDS NOT-IDENTIFIED: 0
OF NON-TCL CONTAMINANTS: 0

ORGANIC PREAWARD EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT

LABORATORY: Ceimic Corporation (RI)

REPORT DATE: 10/12/91
MATRIX: SOIL

COMPOUND	TOLERANCE INTERVALS WARNING LOWER	WARNING UPPER	ACTION LOWER	ACTION UPPER	LABORATORY DATA CONC	Q
TCL VOLATILE						
1,1-DICHLOROETHENE	3900	6700	3500	7100	6000	
CHLOROFORM	8300	11000	7900	12000	11000	
1,2-DICHLOROETHANE	4200	5800	4000	6000	5400	
1,1,1-TRICHLOROETHANE	13000	18000	12000	18000	18000	
1,2-DICHLOROPROPANE	12000	16000	11000	18000	15000	
CIS-1,3-DICHLOROPROPENE	8600	13000	7900	14000	12000	
BROMOFORM	7300	11000	6700	12000	9800	
TOLUENE	4300	5900	4000	6100	5300	
ETHYL BENZENE	8500	12000	8000	12000	10000	
STYRENE	4000	5800	3700	6000	5300	
TCL SEMIVOLATILE						
PHENOL	1000	2200	890	2400	1900	
2-CHLOROPHENOL	780	1600	660	1800	1400	
1,3-DICHLOROBENZENE	410	610	380	720	530	
1,4-DICHLOROBENZENE	730	1500	620	2000	1200	
ISOPHORONE	640	1300	540	1400	1100	
2-METHYLNAPHTHALENE	NU	NU	NU	NU	380	
2-CHLORONAPHTHALENE	400	630	370	670	590	
DIBENZOFURAN	470	830	420	880	730	
[illegible]THYLPHTHALATE	470	680	440	790	540	
[illegible]ENE	870	1700	750	1800	1400	
[illegible]HLOROBENZENE	1200	2000	1100	2100	2100	$
[illegible]ORANTHENE	1100	1700	990	1800	1500	
PYRENE	620	1000	560	1100	930	
BENZO(A)ANTHRACENE	1100	1700	1000	1800	1500	
BENZO(A)PYRENE	880	1600	770	1700	1500	
TCL PESTICIDES						
HEPTACHLOR	6.7	10	6.2	11	8.5	
4,4'-DDE	14	21	14	22	17.4	
ENDRIN	14	22	13	23	15	
4,4'-DDD	23	45	20	48	22.6	$
METHOXYCHLOR	18	41	17	44	9.3	$
NON-TCL VOLATILE						
BENZENE,FLUORO-					19000	
METHANE,DIBROMO-					24000	
NON-TCL SEMIVOLATILE						
BENZENE,1,4-DIBROMO-					2200	

AR301465

ORGANIC PREAWARD EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT

LABORATORY: Ceimic Corporation (RI)

REPORT DATE: 10/12/91
MATRIX: SOIL

COMPOUND	TOLERANCE INTERVALS WARNING LOWER	WARNING UPPER	ACTION LOWER	ACTION UPPER	LABORATORY DATA CONC	Q
BENZENE,1,2,3,4-TETRACHLORO-					2400	
TCL VOLATILE (Contaminants)						
METHYLENE CHLORIDE					540	
TRANS-1,3-DICHLOROPROPENE					390	
NON-TCL SEMIVOLATILE (Contaminants)						
UNKNOWN					170	
UNKNOWN					67	
UNKNOWN					270	
UNKNOWN					67	
UNKNOWN					130	
UNKNOWN					67	
2-PENTANONE,4-HYDROXY-4-METHYL-					7300	

OF TCL COMPOUNDS NOT-IDENTIFIED: 0
OF TCL COMPOUNDS MIS-QUANTIFIED: 0
OF TCL CONTAMINANTS: 0

OF NON-TCL COMPOUNDS NOT-IDENTIFIED: 0
OF NON-TCL CONTAMINANTS: 0

PREAWARD PERFORMANCE EVALUATION
SAMPLE SCORE SHEET

The Preaward Performance Evaluation includes the analysis of one or more Performance Evaluation samples supplied to the laboratory by the EPA. Each sample is evaluated separately, according to the following scoring scheme. Each sample analyzed by the laboratory must receive a passing score in order for the laboratory to pass the Preaward Evaluation.

Laboratory: Ceimic Corporation (CEIMIC)

IFB: D101168R1 Date: 10/16/91

Sample ID: PA391 Matrix: Water

I.	IDENTIFICATION	(800 points)	
	Total number of I points deducted		0
	Points awarded for I		800
II.	QUANTIFICATION	(600 points)	
	Total number of II points deducted		0
	Points awarded for II		600
II.	QUALITY CONTROL	(400 points)	
	Total number of III points deducted		50
	Points awarded for III		350
IV.	REPORTING AND DELIVERABLES	(200 points)	
	Total number of IV points deducted		60
	Points awarded for IV		140
PRELIMINARY SCORE			
	Total of I and II		1400
FINAL SCORE			
	Total of I, II, III, and IV		1890

Sample ID: PA391 Matrix: Water Laboratory Name: CEIMIC

Minimum passing scores:

For I and II 1050

For I, II, III, and IV 1500

The following variables are used in the calculation of the preliminary score, which includes the identification and quantification sections:

29 = X = Number of target compounds included in the study, including those analytes with no acceptance windows

0 = A = Number of target compounds in the study that were not identified

0 = B = Number of target compounds misquantified

0 = C = Number of target compound contaminants (i.e., target compounds not included in the study but identified by the laboratory)

0 = D = Number of tentatively identified compounds not identified

0 = E = Number of tentatively identified compound contaminants (i.e., non-target compounds not included in the study but identified by the laboratory)

I. IDENTIFICATION (800 points)

A. Target Compound Identification (600 points)

(A)(6000)/(X) = (0) X (6000)/(29) = 0 points deducted

B. Target Compound Contaminants (100 points)

(C)(50) = (0) X (50) = 0 points deducted

C. Tentatively Identified Compounds (100 points)

(D + E)(50) = (0 + 0) X (50) = 0 points deducted

II. TARGET COMPOUND QUANTIFICATION (600 points)

(B)(3000)/(X - A) = (0) X (3000)/(29 - 0) = 0 points deducted

PREAWARD PERFORMANCE EVALUATION
SAMPLE SCORE SHEET

The Preaward Performance Evaluation includes the analysis of one or more Performance Evaluation samples supplied to the laboratory by the EPA. Each sample is evaluated separately, according to the following scoring scheme. Each sample analyzed by the laboratory must receive a passing score in order for the laboratory to pass the Preaward Evaluation.

Laboratory: Ceimic Corporation (CEIMIC)

IFB: D101168R1 Date: 10/16/91

Sample ID: PA391 Matrix: Soil

I.	IDENTIFICATION	(800 points)	
	Total number of I points deducted		0
	Points awarded for I		800
II.	QUANTIFICATION	(600 points)	
	Total number of II points deducted		0
	Points awarded for II		600
II.	QUALITY CONTROL	(400 points)	
	Total number of III points deducted		50
	Points awarded for III		350
IV.	REPORTING AND DELIVERABLES	(200 points)	
	Total number of IV points deducted		60
	Points awarded for IV		140
PRELIMINARY SCORE			
	Total of I and II		1400
FINAL SCORE			
	Total of I, II, III, and IV		1890

Sample ID: PA391 Matrix: Soil Laboratory Name: CEIMIC

Minimum passing scores:

For I and II 1050

For I, II, III, and IV 1500

The following variables are used in the calculation of the preliminary score, which includes the identification and quantification sections:

29 = X = Number of target compounds included in the study, including those analytes with no acceptance windows

0 = A = Number of target compounds in the study that were not identified

0 = B = Number of target compounds misquantified

0 = C = Number of target compound contaminants (i.e., target compounds not included in the study but identified by the laboratory)

0 = D = Number of tentatively identified compounds not identified

0 = E = Number of tentatively identified compound contaminants (i.e., non-target compounds not included in the study but identified by the laboratory)

I. IDENTIFICATION (800 points)

A. Target Compound Identification (600 points)

(A)(6000)/(X) = (0) X (6000)/(29) = 0 points deducted

B. Target Compound Contaminants (100 points)

(C)(50) = (0) X (50) = 0 points deducted

C. Tentatively Identified Compounds (100 points)

(D + E)(50) = (0 + 0) X (50) = 0 points deducted

II. TARGET COMPOUND QUANTIFICATION (600 points)

(B)(3000)/(X - A) = (0) X (3000)/(29 - 0) = 0 points deducted

Sample ID: PA391 Laboratory Name: CEIMIC

II. QUALITY CONTROL (400 points)	Number of pts. deducted
A. Instrument Quality Control (175 points for VOA and semivolatile fractions)	
1. Instrument Performance Check (40 points)	
a. DFTPP (20 points maximum)	
1. For failure to perform a DFTPP instrument performance check at the required frequency, deduct 20 points.	0
2. For any DFTPP instrument performance check analyzed separately or as part of the calibration standard, with any ion abundance ratios outside criteria, deduct 20 points.	0
b. BFB (20 points maximum)	
1. For failure to perform a BFB instrument performance check at the required frequency, deduct 20 points.	0
2, For any BFB instrument performance check analyzed separately or added to reagent water, with any ion abundance ratios outside criteria, deduct 20 points.	0
III.A.1 Subtotal	0
2. Initial Calibration (75 points)	
a. For failure to perform initial calibrations at the required frequency for any fraction, deduct 75 points.	0
b. For initial calibration data for VOA or semivolatile fraction, if more than 2 volatile or more than 4 semivolatile compounds fail to meet SOW-specified minimum RRF or maximum %RSD criteria, deduct 25 points for each initial calibration sequence of standards which does not meet the criteria.	0
III.A.2. Subtotal	0
3. Continuing Calibration (60 points)	
a. For failure to perform continuing calibrations for any fraction at the required frequency, deduct 30 points per fraction.	0

Sample ID: PA391 Laboratory Name: CEIMIC

	Number of pts. deducted
b. For continuing calibration data for VOA or semivolatile fraction, if more than 2 volatile or more than 4 semivolatile compounds fail to meet SOW-specified minimum RRF or maximum %D criteria, deduct 25 points for each continuing calibration standard which does not meet the criteria.	0
III.A.3. Subtotal	0
III.A Subtotal	0

B. Instrument Quality Control (100 points for Pesticide/Aroclor fraction).

1. Initial Calibration (75 points) (requirements apply to both GC columns).

a. For failure to perform an initial calibration on either column, when required, deduct 75 points.	0
b. If the standards in the initial calibration sequence are not analyzed in the order given in the SOW, deduct 5 points.	0
c. If the resolution of any analytes in the resolution check mixture or the performance evaluation mixture (PEM) fail to meet the SOW-specified criteria (> or equal to 60% resolution for the resolution check standard, 100% resolution for the PEM), deduct 20 points.	0
d. If the retention times of any analyte in the PEM falls outside a retention time window calculated during the initial calibration, deduct 10 points.	0
e. If the relative percent difference between the calculated amount and true amount of any analyte in the PEM exceeds 25.0 percent, deduct 10 points.	0
f. If the breakdown of either DDT or Endrin exceeds 20.0 percent, or the combined breakdown, as defined in the SOW, exceeds 30.0 percent, deduct 15 points.	15
g. If the %RSD of the calibration factors of any single component analyte or surrogate exceeds 20.0 percent or the %RSD of the surrogates exceeds 30%, deduct 15 points. Allowances may be made for up to two single component target compounds, but not surrogates, to have %RSDs exceeding 20%, but those compounds must have %RSD less than or equal to 30%.	0
III.B.1. Subtotal	15

Sample ID: PA391 Laboratory Name: CEIMIC

	Number of pts. deducted
2. Continuing Calibration (25 points) (requirements apply to both GC columns)	
a. For failure to perform a continuing calibration by analyzing the required standard(s) and instrument blanks before and after the sample data, deduct 25 points.	0
b. If the retention times of any analytes in the continuing calibration standards falls outside a retention time calculated during the initial calibration, deduct 10 points.	10
c. If the relative percent difference between the calculated amount and true amount of any analyte in the PEM or Individual Standard mixtures used to demonstrate continuing calibration exceeds 25.0 percent, deduct 10 points.	0
d. If the breakdown of either DDT or Endrin exceeds 20.0 percent, or the combined breakdown, as defined in the SOW, exceeds 30.0 percent, deduct 5 points.	5
III.B.2. Subtotal	15
III.B. Subtotal	30
C. Sample/Method Quality Control (80 points for VOA and Semivolatile fractions)	
Method Blank Analyses (40 points)	
Failure to perform the method blank analysis for any of the fractions will result in the deduction of 40 points.	0
a. VOA method blank contamination	
If any (one or more) target compounds are detected in the method blank above the contract required quantitation limit (5x the CRQL for methylene chloride, acetone, and 2-butanone), deduct 20 points.	0
b. Semivolatile method blank contamination	
If any (one or more) target compounds are detected in the method blank above the contract required quantitation limit (5x the CRQL for phthalate esters), deduct 20 points.	0
III.C.1 Subtotal	0

Sample ID: PA391 Laboratory Name: CEIMIC

	Number of pts. deducted
2. System Monitoring Compound and Surrogate Recovery (40 points)	
a. VOA System Monitoring Compound recovery	
For failure to meet recovery criteria for any system monitoring compound in any sample or blank, deduct 20 points.	0
b. Semivolatile surrogate recovery	
For failure to meet surrogate recovery criteria listed in Exhibit D, SV, paragraph 8.5, in any sample or blank, deduct 20 points.	0
III.C.2 Subtotal	0
III.C. Subtotal	0
D. Sample/Method Quality Control (45 points for Pesticide/Aroclor fraction)	
1. Surrogate Retention Time Shift (20 points)	
a. For failure to meet the retention time criteria for the surrogates in any sample, blank, or standard, deduct 10 points per occurrence.	20
III.D.1. Subtotal	20
2. Method Blank Analyses (20 points)	
a. If any (one or more) of the Pesticide/Aroclor compounds are detected in a method blank at > CRQL, deduct 20 points.	0
b. For failure to perform method blank analyses on both columns, deduct 20 points.	0
III.D.2. Subtotal	0
3. Gel Permeation Chromatography (5 points)	
a. For failure to perform gel permeation chromatography (GPC) on any soil sample, deduct 5 points.	0
III.D.3. Subtotal	0
III.D. Subtotal	20
Total number of III points deducted	50

Sample ID: PA391 Laboratory Name: CEIMIC

		Number of pts. deducted
V.	REPORTING AND DELIVERABLES (200 points)	
A.	BFB and DFTPP (30 points maximum). Mass listing and bar graph output must be submitted for each instrument and for every 12-hour period during which samples were analyzed. Deduct 15 points for any violation.	0
B.	RICs and quantitation reports (40 points maximum for VOA and Semivolatile fractions). Deduct 20 points for each of these required deliverables that are not submitted in accordance with the Statement of Work.	40
C.	Mass spectra (30 points maximum). Deduct 15 points for each of the required deliverables in either VOA or Semivolatile fractions that are not submitted in accordance with the Statement of Work.	0
D.	Contractual Forms for VOA and Semivolatile fractions (30 points maximum). Deduct 30 points if any of the required deliverables are not submitted in accordance with the Statement of Work. Forms are checked for presence/absence, completeness, and submission of correct form.	0
E.	Chromatograms and Quantitation Reports (40 points for Pesticide/Aroclor fraction). For failure to submit chromatograms that meet the specifications of Exhibits D and E regarding baseline, peak response and on-scale peaks, deduct 20 points per occurrence.	20
F.	Contractual Forms for Pesticide/Aroclor fraction (30 points maximum). For each of the required deliverables, forms not submitted in accordance with the Statement of Work, deduct 10 points. Forms are checked for presence/absence, completeness, and submission of correct form.	0
	Total number of IV. points deducted	60

D101168R1

SOLICITATION, OFFER AND AWARD

1. Certified for National Defense under BDSA Reg.2 and/or DMS Reg. 1 : RATING:

TITLE: Chemical Analytical Services for Multi-media, Multi-concentration Organics

2. CONTRACT NO.	3. SOLICITATION NO.	4. TYPE OF SOLICITATION
68D20021	D101168R1	[X] SEALED BID (IFB) [ ] NEGOTIATED (RFP)

5. DATE ISSUED	6. REQUISITION/PURCHASE NO.
7/9/91	

7. ISSUED BY (Hand-Carried/Courier Address)	8. ADDRESS OFFER TO (If other than Item 7. (U.S. Mail only)
Environmental Protection Agency Contracts Mgt. Division (MD33) Admin. Bld. Lobby Alexander Dr. Research Triangle Park, NC 27711	Environmental Protection Agency Contracts Mgmt Division (MD33) Research Triangle Park, NC 27711

NOTE: In sealed bid solicitations, "offer and offeror" mean "bid and bidder".

SOLICITATION

9. Sealed offers in original and 4 copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository listed in Item 7, until 1:00 P.M. local time on 8/9/91. CAUTION-LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-10. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL A.NAME Marian Bernd
B. TELEPHONE NO.(No Collect Calls) Contracting Officer

11. TABLE OF CONTENTS

APPROVED BY OIRM 3/84, FAR (48 CFR 53.214(e)) EXCEPTION TO STANDARD FORM 33

SOLICITATION, OFFER AND AWARD

OFFER (Must be fully completed by offeror)

NOTE Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days (160 calendar days unless a different perio is inserted by the offeror) from the date for receipt of offers specified above to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT (See Section I, Clause No. 52.232-8)

10 Calendar days	20 Calendar days	30 Calendar days	__ Calendar days
___%	___%	___%	___%

14. ACKNOWLEDGEMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated:

AMENDMENT NO	DATE	AMENDMENT NO	DATE
1	JULY 17, 1991	3	AUGUST 12, 1991
2	AUGUST 9, 1991		

15A. NAME AND ADDRESS OF OFFEROR
Code: Facility:

CEIMIC CORPORATION
10 DEAN KNAUSS DRIVE
NARRAGANSETT, RI 02882

15B. TELEPHONE NO. (Include Area Code) 401·782·8900

15C. [ ] CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE ENTER SUCH ADDRESS IN SCHEDULE

16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER
(Type or Print)
ROBERT W. FLYNN, VICE PRESIDENT

17. SIGNATURE: Robert W. Flynn

18. OFFER DATE: 8·20·91

(To be completed by the Government)

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION
BID LOT 1 & 2	MIN. OBLIGATION $458,832.	68/20X8145 FF0005 P-11 2TFA72FTM 2535 $458,832

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION
[ ] 10 U.S.C. 2304(c)( ) [ ] 41 U.S.C. 253(c)( )

23. SUBMIT INVOICES TO ADDRESS SHOWN IN ITEM 24
(4 copies unless otherwise specified)

24. ADMINISTERED BY (If other than Item 7)

25. PAYMENT WILL BE MADE BY
Environmental Protection Agency
National Contract Payment
Division (MD-32)
Research Triangle Pk, NC 27711

26. NAME OF CONTRACTING OFFICER
MARIAN BERND
(Type or Print)

27. UNITED STATES OF AMERICA
(Signature of Contracting Officer)

28. AWARD DATE 1/30/92

IMPORTANT - Award will be made on this Form or on Standard Form 26, or by other authorized official written notice.

APPROVED BY OIRM 3/84, FAR (48 CFR 53.214(e)) EXCEPTION TO STANDARD FORM 33

SCORE SHEET
INORGANIC PREAWARD PERFORMANCE EVALUATION
D101419R1/20R1/21R1/D102486R1

LABORATORY: Celmic Corp. (RI)

FINAL SCORE: 92.72
DATE: 01/10/92

Maximum Number of Points Possible : 100

Scoring System Determines Points Deducted from 100

	Points Deducted
I. Performance Evaluation Samples	6.38

Water: Analytes Not-Identified:
Analytes Mis-Quantified: Cd, Na
False Positives:

Soil : Analytes Not-Identified:
Analytes Mis-Quantified:
False Positives:

Points Deducted = (5 A + B + 2 C)w + (5 A + B + 2 C)s

where A = number of Not-Identified
B = (1 - Y^1.5) x 50
Y = (number of Analytes - number Missed - number of Not-ID's) / number of Analytes
C = number of False Positives
w = water matrix
s = soil matrix

II. Quality Control

A. Matrix Spikes (maximum of 10 points deducted) 0

Water :
Soil :

Points Deducted = 0.5 point x number of matrix spikes outside of control limits

B. Duplicates (maximum of 10 points deducted) 0

Water :
Soil :

Points Deducted = 1 point x number of duplicate results outside of control limits

III. Reporting and Deliverables

Failure to comply with the following requirements will result in points deducted from the total score.

A. Instrument detection limits determined and submitted, with all Contract Required Detection Limits met (maximum of 5 points deducted) 0

B. All contractual forms (1 - 14, DC-1 & DC-2) submitted in a substantially complete manner (maximum of 5 points deducted) 0.9

C. Acceptable raw data submitted for the preaward analysis (maximum of 5 points deducted

AR301478

INORGANIC PREAWARD PERFORMANCE EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT
D101419R1/20R1/21R1/D102486R1

LABORATORY NAME: Cofmic Corp. (RI) CW11 (CEINIC)

LABORATORY RANK: Above = 0 Same = 6 Below = 27

Points Deducted: 0
REPORT DATE: 1/10/1992
MATRIX: SOIL 1

ELEMENT NAME	95 % CI		LAB RESULTS		PROGRAM DATA					
	LOWER	UPPER	REPORTED VALUE	QUALIFIER CODE	#LABS NOT-ID	#LABS MIS-QUANT	#LABS FALSE POS	#LABS MSPK OUT	#LABS DUP OUT	TOTAL #LABS
ALUMINUM	389	753	557		0	2	0	0	0	36
ANTIMONY	12.0	50.7	13.4		11	7	0	20	0	36
ARSENIC	1060	1370	1230	S	1	5	0	0	0	36
BARIUM	d	d	15.5	E	0	0	0	1	0	36
BERYLLIUM	1.0	11.1	0.22	B	12	6	0	9	1	36
CADMIUM	644	881	768	E	0	2	0	0	0	36
CALCIUM	156001	216001	189000		1	3	0	0	0	36
CHROMIUM	16.8	29.6	23.4		1	8	0	0	0	36
COBALT	15.1	21.8	17.9		1	7	0	0	0	36
COPPER	1520	2020	1690		0	0	0	0	0	36
IRON	7320	10500	9050	E	0	1	0	0	0	36
LEAD	22800	33501	31200		0	4	0	0	0	36
MAGNESIUM	89701	114001	97000		0	2	0	0	0	36
MANGANESE	309	434	361	E	0	0	0	4	0	36
MERCURY	2.6	4.5	2.8		0	6	0	1	4	36
NICKEL	64.6	93.7	80.2		0	1	0	3	0	36
POTASSIUM	c	c	382	U	0	0	0	0	0	36
SELENIUM	1.0	1.2	0.94	B	13	9	5	15	1	36
SILVER	2.0	11.2	6.7		10	4	0	9	2	36
SODIUM	d	d	795	U	0	0	0	0	0	36
THALLIUM	d	d	0.39	UW	0	0	0	6	1	36
VANADIUM	3810	5240	4940		0	1	0	0	0	36
ZINC	26300	38201	33800		0	3	0	0	1	36

OF ELEMENTS NOT-IDENTIFIED: 0
OF ELEMENTS MIS-QUANTIFIED: 0
OF FALSE POSITIVES: 0

INORGANIC PREAWARD PERFORMANCE EVALUATION SAMPLE
INDIVIDUAL LABORATORY SUMMARY REPORT
0101419R1/20R1/21R1/0102486R1

LABORATORY NAME: Ceimic Corp. (RI) [WI] (CEIMIC)

LABORATORY RANK: Above = 22 Same = 7 Below = 6

Points Deducted: 6.38
REPORT DATE: 1/10/1992
MATRIX: WATER 1

ELEMENT NAME	95 % CI LOWER	95 % CI UPPER	LAB RESULTS REPORTED VALUE	QUALIFIER CODE	PROGRAM DATA #LABS NOT-ID	#LABS MIS-QUANT	#LABS FALSE POS	#LABS MSPK OUT	#LABS DUP OUT	TOTAL #LABS
ALUMINUM	2810	3550	3040		0	0	0	0	0	36
ANTIMONY	88.8	158	101		0	2	0	0	0	36
ARSENIC	79.2	126	86.3		1	3	0	1	0	36
BARIUM	466	547	497		0	2	0	0	0	36
BERYLLIUM	399	475	423		0	0	0	0	0	36
CADMIUM	27.1	38.5	26	X	0	3	0	3	1	36
CALCIUM	55201	67001	60800		0	1	0	0	1	
CHROMIUM	279	326	296		0	1	0	0	0	
COBALT	182	218	188		0	1	0	0	0	36
COPPER	88.4	125	116		0	2	0	2	0	36
IRON	569	700	596		0	3	0	0	1	36
LEAD	263	355	286		0	2	0	1	0	36
MAGNESIUM	d	d	222	B	0	0	0	0	0	36
MANGANESE	146	173	149		0	2	0	0	0	36
MERCURY	0.2	0.68	0.39		3	2	0	1	0	36
NICKEL	344	436	379		1	2	0	1	0	36
POTASSIUM	10400	13500	11000		0	3	0	0	0	36
SELENIUM	249	352	306		1	7	1	1	0	36
SILVER	216	272	242		0	0	0	0	0	36
SODIUM	17900	21900	17400	X	0	4	0	0	0	36
THALLIUM	91.4	117	96.6		0	6	0	0	0	36
VANADIUM	564	646	581		0	2	0	0	0	36
ZINC	914	1090	1040		0	2	0	0	1	36
CYANIDE	81.1	153	99.9		0	6	0	4	1	36

OF ELEMENTS NOT-IDENTIFIED: 0
OF ELEMENTS MIS-QUANTIFIED: 2
OF FALSE POSITIVES: 0

CONTRACT
EVIDENCE
AUDIT
TEAM

April 22, 1991

Ms. Deborah Szaro
Technical Project Officer
USEPA Region I
60 Westview Street
Lexington, MA 02173

RE: Transmittal of CEAT Laboratory Evidence Audit Report for Ceimic Corporation

Dear Ms. Szaro:

Enclosed is the Contract Evidence Audit Team (CEAT-TechLaw) laboratory evidence audit report for the organics audit conducted at Ceimic Corporation on March 20, 1991.

Procedures and documentation related to sample receiving, sample storage, sample identification, sample security, sample tracking and case file organization and assembly were reviewed for conformance to Evidence Audit Requirements. Nonconformances to Evidence Audit Requirements are identified in the Findings section of the attached report. Procedures for developing a written response to the findings are discussed in the Recommendations for Corrective Action section of the report.

If you have any questions, please contact Kaye Mathews, the NEIC Quality Assurance Manager, at (303) 236-5147, FTS 776-5147.

Sincerely,

Kerri G. Luka
Contract Evidence Audit Team

Concurrence:

Kaye I. Mathews
National Enforcement
Investigations Center

KGL:mb

Enclosure

cc: Michael Hurd, USEPA Headquarters, APO
David Dickinson, Ceimic Corporation

IF: D232-001

LABORATORY EVIDENCE AUDIT REPORT

CEIMIC CORPORATION
EPA Identifier: CEIMIC

Audit Date: March 20, 1991

CEIMIC CORPORATION
10 Dean Knauss Drive
Narragansett, RI 02882
(401) 782-8900

David Dickinson	-	QA/QC Director[1,2,3]
Kin S. Chiu	-	Organic Laboratory Manager[3]
Veronica Moretti	-	Document Control Officer[2,3]
Chris Sheldon	-	Sample Custodian[2]
Phyllis Shiller	-	Inorganic Analyst[2]

NEIC/CEAT (TechLaw, Inc.) - Lakewood, Colorado
(303) 233-1248

Matt Francis	-	Staff Associate
Mike Meshek	-	Staff Associate

[1] Present at pre-audit briefing
[2] Contacted during audit
[3] Present at post-audit debriefing

This work is being conducted on behalf of the Environmental Protection Agency's (EPA) National Enforcement Investigations Center (NEIC) under EPA contract 68-W0-0001.

I. INTRODUCTION

An audit of laboratory operations pertaining to laboratory security, sample chain-of-custody, and document control procedures for EPA inorganics contract 68-D9-0070 (IFB D900205R1), was conducted at Ceimic Corporation in Narragansett, Rhode Island on March 20, 1991. This was the second routine audit of Ceimic Corporation conducted by NEIC's Contract Evidence Audit Team (CEAT-TechLaw) in support of the Contract Laboratory Program (CLP). The audit procedures, results of the audit, and recommendations for corrective action are identified in the following sections of this evidence audit report.

II. EVIDENCE AUDIT PROCEDURES

Procedures and documentation related to sample receiving, sample identification, sample storage, sample security, sample tracking, and case file organization and assembly were reviewed for conformance to Evidence Audit Requirements. The audit consisted of two components, including a procedural audit and an evidence audit of the sample delivery group (SDG)/case file. The procedural audit consisted of review and examination of actual and written standard operating procedures (SOPs) and accompanying documentation. The evidence audit of the SDG/case file consisted of review and examination of SDG/case file documentation.

III. FINDINGS

The following findings were discussed by the CEAT auditors during the debriefing with laboratory personnel at the conclusion of the audit on March 20, 1991. These findings reflect nonconformances to Evidence Audit Requirements. The first finding is repeated from the previous audit, which was conducted on March 20, 1990.

1. The written SOPs for sample tracking and document control did not include a copy of the Summary of Telephone Calls used to document the resolution of sample receiving problems with the SMO.

2. All documents relevant to each SDG were not included in the case files prior to submission of the case file to EPA/NEIC. Specifically, the Sample Control Record, Sample Delivery Log pages, and records of failed or attempted analyses were not included in the case files.

3. The name of the laboratory was not printed on the Summary of Telephone Calls.

IV. RECOMMENDATIONS FOR CORRECTIVE ACTION

Ceimic Corporation personnel should submit the following items as written response to the CEAT's findings in order to satisfy Evidence Audit Requirements:

- A copy of the revised written SOPs for sample tracking and document control (finding 1);
- A record of communication with the appropriate laboratory personnel indicating that the procedure described in finding 2 was discussed, as well as documentation of observations made by the quality assurance officer indicting that the correct procedure has been implemented at the laboratory; and
- A copy of the Summary of Telephone Calls which has been revised to indicate the name of the laboratory (finding 3).

The response should be transmitted to Deborah Szaro, the EPA Region I Technical Project Officer, within 30 days after receipt of this report and a copy should be transmitted concurrently to the CEAT. Upon receipt of the corrective action response, the CEAT staff will review the response. Following approval by the NEIC, a report of the corrective action results will be sent to Deborah Szaro, Michael Hurd, and Ceimic Corporation.

Periodic audits will be conducted to review continued conformance to Evidence Audit Requirements.

CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

May 31, 1991

Ms. Moira Lataille
USEPA Region I TPO
Environmental Services Division
60 Westview Street
Lexington, MA 02173-3185

Re: Ceimic's Written Response to the CEAT Laboratory Evidence Audit Report for Both Organic and Inorganic Contracts

Dear Moira:

In response to CEAT's audit on March 20, 1991, and letter dated April 11, 1991, I have addressed below each point detailed in the Recommendations for Corrective Action section.

ORGANIC

1. Included as Attachments 1-3 are copies of memos distributed to the applicable personnel. Both the Sample Control Record and the Sample Delivery Log were added to the Case Purge table of contents and are now part of the purge package (refer to Attachment 4).

   I have personally reviewed Case Purge 15219 SDGHK139 and have found it to be complete.

2. The title has been added to the Project Number Log, as required (refer to Attachment 5).

   The laboratory ID has been added to the Telephone Log (refer to Attachment 6).

   The GC Run Logs have been revised to include at the top of each page the instrument type and parameter group (refer to Attachment 7).

3. Enclosed with this correspondence are revised SOPs for Tracking Sample Analysis (5.0), Laboratory Sample & Document Flow (8.0), Sample Storage and Security (4.0), and Data Assembly and File Purge. These have been revised per your recommendations.

10 Dean Knauss Drive, Narragansett, R.I. 02882 • (401) 782-8900 • FAX (401) 782-8905

INORGANIC

1. Refer to Item 3 above.
2. Refer to Item 1 above.
3. Refer to Item 2 above.

If I can be of further assistance with this response, please feel free to call.

Sincerely,

Dave Dickinson, Director
Quality Assurance/Quality Control

cc: Michael Hurd, USEPA Headquarters, APO
Kaye Mathews, NEIC
Kerri C. Luka, CLAT
John McGarry, Jr.

DD/ELG
Enclosures
a:audit.mem

MEMORANDUM

TO: Lab Personnel
FROM: Dave Dickinson
Director, QA/QC
DATE: 31 May 91

RE: Logbook Entries

1. All entries in logbooks are to be made in ink (preferably black). Pencils are not allowed in the laboratories and should never be used to make entries in laboratory notebooks.

2. When a correction is required, a single line is drawn ~~through~~ through the error and the mistake corrected, initialed, and dated.

3. All logbook pages are to be signed and dated at the time the analysis is performed. An analysis is not considered complete until the logbook page has been photocopied and placed in the case file.

4. On a timely basis, the applicable laboratory supervisor shall sign the notebook page indicating his review and acceptance of the material for completeness and correctness.

It is the responsibility of the laboratory supervisors to assure that these standard operating procedures are adhered to.

Thank you for your attention.

MEMORANDUM

TO: VOA Lab Personnel
FROM: Dave Dickinson
Director, QA/QC
DATE: 31 May 91

RE: Logbook Signatures

The Volatile Organics Tracking Log and the Volatile (VOA) Criteria Checklist are to be signed and dated by the person(s) responsible for performing the recorded activities at the time the activities were recorded.

It is the responsibility of the laboratory supervisor to assure that this standard operating procedure is adhered to.

Thank you for your attention.

MEMORANDUM

TO: BNA And Pesticide Lab Personnel, Document Control
FROM: Dave Dickinson
Director, QA/QC
DATE: 31 May 91

RE: Failed Runs

The following comment was presented by the Contract Evidence Audit Team in regards to failed or attempted analysis runs: "All documents relavant to each SOC were not included in the case file prior to submission of the case file to EPA/NEIC. Specifically,..., and all records of failed or attempted analysis for BNA and pesticide fractions were not included in the case files".

It is important to document on the instrument run logs all runs pertaining to an EPA case, whether good or not. Either generation of the quant report or a notation on the instrument run log as to why it could not be generated are the only two acceptable alternatives. These failed runs are to be kept with the case file.

It is the responsibility of the laboratory supervisors to assure that these standard operating procedures are adhered to.

Thank you for your attention.

Attachment

CHEMIC CORPORATION Figure 1
Table of contents for Purged Files

pages	Items	Number c
CCCCO-OO-OO	...Chain of Custody	OC
OOOOO-OO-OO	...Traffic Reports	CC
OOOCO-OO-OO	...Sample Tags	OC
OOOOO-OO-OO	...Airbills	OC
OOOOO-OC-CO	...Sample Delivery Log	C
OOOCO-CC-CO	...Incoming Sample Tracking Log	OC
OOOOC-OO-OO	...Project Number log	OC
OOOCO-OO-OO	...Cooler Log	OC
CCOCO-OO-OO	...Refrigerator Temperature Log	OC
OCCOC-OO-OO	...Sample Control Record	OC
OCOOO-OO-OO	...Personal Logbooks	CC
OOOOC-OO-OO	...Prep Notebooks	O(
OOOOO-OO-OC	...Extraction Logbook	O(
OCOOO-OO-CO	...XD Logbooks	O(
OOOOO-CO-OO	...Extraction Transfer Logbook	OC
OOOOC-OO-OO	...Pest/PCB Logbooks	OC
OOCCC-CO-OC	...Pest/PCB Chromatograms	OC
CCCOO-OO-OC	...Pest/PCB Standards Logbook	OC
OCOCO-OC-OO	...Pest/PCY Instrument Logbook	OO
OOCCO-CO-OO	...BNA Logbook	OC
OOOCO-OO-OO	...BNA Criteria Checklist	CC
OOOOO-OC-OC	...BNA Instrument Logbook	OC
OOOOO-OC-CO	...VOA Refrigerator Tracking Logbook	OO
OOOCC-CC-CO	...VOA Logbooks	OO
OOOCO-OO-OO	...VOA Criteria Checklist	OO
OOCCC-OO-OO	...VCA Instrument Logbooks	OO
OCCOO-OO-OO	...Telephone Tracking Log	OO
COOOO-OO-OO	...Miscellaneous	OO

NA = Not Available

10 Dean Knauss Drive, Narragansett, RI 02582

AR301490

PROJECT NUMBER LOG

Date	Project Number	Client	Courier	Comments	Init

10 Jean Krauss Drive, Narragansett, RI 02882 (401) 783-3900

Attachment

SUMMARY OF TELEPHONE CALLS

☐ INCOMING ☐ OUTGOING

SUBJECT

PERSON CALLING OR CALLED

DATE

TIME

COMPANY OR ORGANIZATION

PHONE:

CEIMIC CORPORATION
168 DEAN KNAUSS DRIVE
NARRAGANSETT, RHODE ISLAND 02882

SUMMARY OF CALL:

AR301492

PESTICIDE / PCB SAMPLE RUN LOG
CEIMIC CORPORATION

TEMP PROGRAM: _____

GC: ____
COLUMN PHASE: ____
VOLUME INJ: ____

DATE	SAMP.#	FILE #	SAMPLE ID	DIL	COMMENTS	I

GOLDER ASSOCIATES
BERKS WORK PLAN
Methods
December 12, 1991

AQUEOUS SAMPLES	METHOD	SOIL/ SEDIMENT	METHOD
Ammonia	EPA 350.2	Ammonia	EPA 350.2 per C.D. 12/13/91
Nitrate	EPA 353.3	Nitrate	EPA 353.2
Total Kjeldahl Nitrogen	EPA 351.3		
Total Organic Carbon	Subcontracted	Total Organic Carbon	Subcontracted
Total Inorganic Carbon	Subcontracted		
COD	EPA 410.4	COD	EPA 410.4
Total Alkalinity	EPA 310.2		
Hardness	EPA 200.7		
Chloride	S.M. 407A		
Fluoride	EPA 340.2		
Total Phosphorus	EPA 365.2		
Sulfate	EPA 375.4		
Chromium (+6)	EPA SW846 7196	Chromium (+6)	EPA SW846 7196
BOD	EPA 405.1	BOD	Subcontracted
Total Solids	EPA 160.3	Total Solids	EPA 160.3
TDS	EPA 160.1		
TSS	EPA 160.2		
Turbidity	EPA 180.1		
Color	EPA 110.2		
pH	EPA 150.1	pH	EPA SW846 9040
Specific Conductance	EPA SW846 9050	Specific Conductance	EPA SW846 9050

Detection Limits (MDL Study) - Ceimic defines its reporting limits for these analytes as the method detection limits for those analytes. A complete listing of reporting limits for these analytes is enclosed.

Accuracy Requirements - Percent recoveries on all laboratory control samples must fall within the 75-125% range.

Precision Requirements - Relative percent difference of duplicate analyses (when a client requests a duplicate analysis) must correspond as follows: ± 20% for aqueous matrices; ± 30% for solid matrices.

QA/QC - Ceimic provides the following QA/QC with each batch of analyses:

1. Prep blank;
2. laboratory control sample (where applicable);
3. spike and/or duplicate analysis, when requested; and
4. laboratory control sample duplicate, when requested.

REPORTING LIMITS
BERKS WORK PLAN
December 12, 1991

ANALYSIS	MATRIX	METHOD REPORTING LIMIT (PPM)
Ammonia	Aqueous	0.1
	Soil/Sediment	5.0
Nitrate	Aqueous	0.02
	Soil/Sediment	0.4
Total Kjeldahl Nitrogen	Aqueous	0.5
COD	Aqueous	5.0
	Soil/Sediment	100.0
Total Alkalinity	Aqueous	2.0
Hardness	Aqueous	~~0.5~~ 2.0 per C.D. 12/13/91
Chloride	Aqueous	2.0
Fluoride	Aqueous	0.1
Total Phosphorus	Aqueous	0.1
Sulfate	Aqueous	5.0
Chromium (+6)	Aqueous	0.01
	Soil/Sediment	0.2
BOD	Aqueous	2.0
Total Solids	Aqueous	5.0
	Soil/Sediment	ND
TDS	Aqueous	5.0
TSS	Aqueous	5.0
Turbidity	Aqueous	0.1
Color	Aqueous	5.0
pH	Aqueous	0.1
	Soil/Sediment	0.1
Specific Conductance	Aqueous	5.0

TARGET COMPOUND LIST

VOLATILE ORGANICS

EPA Method 624/8240

Client:

Client Sample ID: Laboratory ID:

Date Sample Received: Date Sample Prepared:

Date Sample Analyzed: Concentration in:

Target Analyte	Sample Concentration	Method Reporting Limits
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	5
Acetone	ND	10
Carbon disulfide	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
1,2-Dichloroethene (total)	ND	5
Chloroform	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	10
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
2-Chloroethylvinyl ether	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5

TARGET COMPOUND LIST

VOLATILE ORGANICS

EPA Method 624/8240

Client:

Client Sample ID: Laboratory ID:

Target Analyte	Sample Concentration	Method Reporting Limits
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
4-Methyl-2-pentanone	ND	10
2-Hexanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Xylene (total)	ND	5

NA = Not applicable
ND = Not detected

Reported by: _____ Approved by: _____

TARGET COMPOUND LIST

EXTRACTABLE ORGANICS

EPA Method 625/8270

Client:

Client Sample ID: **Laboratory ID:**

Date Sample Received: **Date Sample Prepared:**

Date Sample Analyzed: **Concentration in: ug/L (ppb)**

Target Analyte	Sample Concentration	* Method Reporting Limits
Phenol	ND	10
Bis(2-chloroethyl)ether	ND	10
2-Chlorophenol	ND	10
1,3-Dichlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
Benzyl alcohol	ND	10
1,2-Dichlorobenzene	ND	10
2-Methylphenol	ND	10
Bis(2-chloroisopropyl)ether	ND	10
4-Methylphenol	ND	10
n-Nitroso-di-n-propylamine	ND	10
Hexachloroethane	ND	10
Nitrobenzene	ND	10
Isophorone	ND	10
2-Nitrophenol	ND	10
2,4-Dimethylphenol	ND	10
Benzoic acid	ND	50
Bis(2-chloroethoxy)methane	ND	10
2,4-Dichlorophenol	ND	10
1,2,4-Trichlorobenzene	ND	10
Naphthalene	ND	10
4-Chloroaniline	ND	10
Hexachlorobutadiene	ND	10
4-Chloro-3-methylphenol	ND	10
2-Methylnaphthalene	ND	10
Hexachlorocyclopentadiene	ND	10

SOILS ug/kg (ppb)
10 = 330
20 = 660
50 = 1600

Note * → AR301498

TARGET COMPOUND LIST

EXTRACTABLE ORGANICS

EPA Method 625/8270

Client:

Client Sample ID: Laboratory ID:

Target Analyte	Sample Concentration	Method Reporting Limits
2,4,6-Trichlorophenol	ND	10
2,4,5-Trichlorophenol	ND	50
2-Chloronaphthalene	ND	10
2-Nitroaniline	ND	50
Dimethylphthalate	ND	10
Acenaphthylene	ND	10
3-Nitroaniline	ND	50
Acenaphthene	ND	10
2,4-Dinitrophenol	ND	50
4-Nitrophenol	ND	50
Dibenzofuran	ND	10
2,4-Dinitrotoluene	ND	10
2,6-Dinitrotoluene	ND	10
Diethyl phthalate	ND	10
4-Chlorophenyl phenyl ether	ND	10
Fluorene	ND	10
4-Nitroaniline	ND	50
4,6-Dinitro-2-methylphenol	ND	50
n-Nitrosodiphenylamine	ND	10
4-Bromophenyl phenyl ether	ND	10
Hexachlorobenzene	ND	10
Pentachlorophenol	ND	50
Phenanthrene	ND	10
Anthracene	ND	10
Di-n-butylphthalate	ND	10
Fluoranthene	ND	10
Benzidine	ND	50
Pyrene	ND	10
Butylbenzylphthalate	ND	10
3,3'-Dichlorobenzidine	ND	20
Benzo(a)anthracene	ND	10

TARGET COMPOUND LIST

EXTRACTABLE ORGANICS

EPA Method 625/8270

Client:

Client Sample ID: Laboratory ID:

Target Analyte	Sample Concentration	Method Reporting Limits
Bis(2-ethylhexyl)phthalate	ND	10
Chrysene	ND	10
Di-n-octylphthalate	ND	10
Benzo(b)fluoranthene	ND	10
Benzo(k)fluoranthene	ND	10
Benzo(a)pyrene	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Dibenzo(a,h)anthracene	ND	10
Benzo(g,h,i)perylene	ND	10

ND = Not detected

Reported by:_____ Approved by:_____

METHOD DETECTION LIMIT STUDIES

INORGANICS

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: CEIMIC Lab Code: CEIMIC

Date: 10/01/91

Inductively Coupled Argon Plasma

Analyte	Wave-length	Back-ground	CRDL (ug/L)	IDL (Ug/L)	M
Aluminum	308.22		200	72.0	P
Antimony	206.83		60	45.0	P
Arsenic			10	79.0	P
Barium	233.53		200	3.0	P
Beryllium	313.04		5	1.0	P
Cadmium	214.44		5	4.0	P
Calcium	317.93		5000	38.0	P
Chromium	205.55		10	7.0	P
Cobalt	228.62		50	10.0	P
Copper	324.75		25	2.0	P
Iron	259.94		100	9.0	P
Lead			3	45.0	P
Magnesium	279.08		5000	40.0	P
Manganese	257.61		15	1.0	P
Nickel	213.60		40	12.0	P
Potassium	766.49		5000	2140.0	P
Selenium			5	74.0	P
Silver	328.07		10	6.0	P
Sodium	589.59		5000	4450.0	P
Vanadium	292.40		50	4.0	P
Zinc	213.86		20	2.0	P

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: CEIMIC Lab Code: CEIMIC

Date: 10/01/91

Mercury Cold Vapor

Analyte	Wave-length	Back-ground	CRDL (ug/L)	IDL (Ug/L)	M
Mercury	253.70		0.2	0.2	CV

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: CEIMIC Lab Code: CEIMIC

Date: 10/01/91

Graphite Furnace

Analyte	Wave-length	Back-ground	CRDL (ug/L)	IDL (Ug/L)	M
Antimony			60	2.0	F
Arsenic	193.70	BZ	10	2.0	F
Lead			3	1.0	F
Selenium	196.00	BZ	5	4.0	F
Thallium			10	1.0	F

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: CEIMIC Lab Code: CEIMIC

Date: 10/01/91

Graphite Furnace

Analyte	Wave-length	Back-ground	CRDL (ug/L)	IDL (Ug/L)	M
Arsenic			10	2.0	F
Beryllium			5	1.0	F
Cadmium			5	1.0	F
Lead	283.30	BZ	3	1.0	F
Selenium			5	3.0	F
Thallium	276.80	BZ	10	2.0	F

PESTICIDE/PCBs

MDL-TOXAPHENE on GC7
(10/20/1991)

I. MDL-TOXAPHENE ON GC7A (DB-1701)

1. RAW DATA

STANDARD:

RT	23.68	23.94	24.69	25.12	25.70	RF
PEAK	14421	11184	19980	12119	10030	33357

MDL SAMPLE:						SUM
SEQ-1	8327	5014	9257	6209	4815	33622
SEQ-2	8244	4964	9112	5133	4976	33429
SEQ-3	8049	4772	9289	5189	4730	33009
SEQ-4	8807	5175	9535	6245	4675	34537
SEQ-5	8733	5250	9730	6669	4975	35357
SEQ-6	8701	5211	9809	5459	4940	35150
SEQ-7	8859	5185	9823	5303	5007	34757
SEQ-8	8709	5268	9932	6485	5091	35484
SEQ-9	6409	5072	9523	5093	4851	31948

NOTE: SEQ-9 IS NOT USED IN THE MDL CALCULATION.

2. CONCENTRATION and MDL (ug/L)

SEQ-1	4.955
SEQ-2	4.937
SEQ-3	4.875
SEQ-4	5.100
SEQ-5	5.223
SEQ-6	5.191
SEQ-7	5.133
SEQ-8	5.237
S	0.1385
MDL	0.419

II. MDL-TOXAPHENE ON GC7A (DB-608)

1. ROW DATA

STANDARD:

RT	20.92	21.64	22.38	22.79	RF
PEAK	382887	328815	278837	277834	624578.5

MDL SAMPLE:					SUM
SEQ-1	162173	139289	122814	209299	633575
SEQ-2	159133	136212	117581	205089	618015
SEQ-3	168585	142815	125891	214298	650039
SEQ-4	162323	140509	124801	205735	635229
SEQ-5	166093	143592	128537	217311	657539
SEQ-7	173837	148878	128473	219751	668944
SEQ-8	170153	148070	130321	215473	662017
SEQ-9	167431	142248	121355	185175	617210
SEQ-6	174702	151305	132957	225079	684044

NOTE: SEQ-6 IS NOT USED IN THE MDL CALCULATION.

2. CONCENTRATION and MDL (ug/L)

SEQ-1	5.070
SEQ-2	4.947
SEQ-3	5.203
SEQ-4	5.092
SEQ-5	5.264
SEQ-7	5.335
SEQ-8	5.299
SEQ-9	4.940
S	0.1550
MDL	0.4647

MDL–INDA/INDS on GCS
(10/20/1991)

I. FRONT COLUMN (DB–608)

A. INDA–MDL
1. RAW DATA

RT	9.85	10.95	12.06	14.21	15.42	16.54	18.51	19.58	22.77
ng	0.060	0.060	0.060	0.060	0.060	0.060	0.100	0.150	0.250
INITIAL	35503	31644	35242	27676	32558	33408	39035	39755	31924

SEQ #	g–BHC	HEPT	ALDRIN	HEPT EP	ENDO I	DIELD	ENDO II	DDT	METH
SEQ–1	2227	2406	1644	2050	1885	3782	3306	2066	7023
SEQ–2	2178	2424	1595	2078	1890	3871	3409	2170	7378
SEQ–3	2108	2403	1571	2067	1697	3361	3337	2068	6950
SEQ–4	2093	2351	1526	2055	1519	3746	3205	2134	7056
SEQ–5	2135	2505	1590	2114	1206	3884	3355	2209	7445
SEQ–6	2101	2373	1532	2005	1792	3851	3210	2150	7451
SEQ–7	2040	2445	1552	2036	1829	3707	3207	2065	7216
SEQ–8	3429	3556	2326	3092	2761	5304	5005	3335	10957
SEQ–9	1665	2294	1554	1670	1737	3535	3092	1912	6095

NOTE: ONLY SEQ–1 THROUGH 7 ARE USED IN THE FOLLOWING CALCULATIONS.

2. CONCENTRATIONS (µg/L) and MDL

SEQ #	g–BHC	HEPT	ALDRIN	HEPT EP	ENDO I	DIELD	ENDO II	DDT	METH
SEQ–1	0.0163	0.0227	0.0151	0.0221	0.0229	0.0454	0.0455	0.0305	0.2503
SEQ–2	0.0179	0.0229	0.0175	0.0224	0.0232	0.0463	0.0469	0.0409	0.2643
SEQ–3	0.0173	0.0229	0.0173	0.0222	0.0233	0.0462	0.0459	0.0384	0.2725
SEQ–4	0.0172	0.0221	0.0166	0.0219	0.0223	0.0449	0.0441	0.0403	0.262
SEQ–5	0.0175	0.0236	0.0175	0.0226	0.0234	0.0465	0.0463	0.0417	0.2671
SEQ–6	0.0173	0.0224	0.0169	0.0215	0.022	0.0457	0.0442	0.0407	0.2677
SEQ–7	0.0168	0.023	0.0163	0.0219	0.0225	0.0444	0.0441	0.0389	0.259
S	0.00049	0.00047	0.00058	0.00039	0.00054	0.00106	0.00116	0.00097	0.00618
MDL	0.0015	0.0015	0.0018	0.0012	0.0017	0.0033	0.0036	0.003	0.0257

B. INDS–MDL
1. RAW DATA

RT	8.42	10.21	11.5	12.06	14.78	15.4	16.52	17.8	18.52	20.15	22.74
ng	0.060	0.160	0.100	0.060	0.100	0.100	0.100	0.100	0.170	0.15	0.14
INITIAL	37442	55868	52554	35015	42220	42419	31547	38508	38088	43011	49574

SEQ #	a–BHC	b–BHC	d–BHC	ALDRIN	g–CHLO	a–CHLO	DDE	ENDRIN	DDD	END SUL	END KET
SEQ–1	1957	1513	1521	1605	20177	22545	2249	2714	1474	2951	3100
SEQ–2	1951	1538	1567	1661	20055	20616	2528	2703	1654	2701	3259
SEQ–3	2206	1858	1808	1726	22365	23120	2525	3132	1809	3405	3514
SEQ–4	2243	1825	1863	1707	22402	22925	2522	1794	1647	3234	4175
SEQ–5	2203	1834	1807	1799	22165	22704	2740	3015	1762	3393	3507
SEQ–6	2224	2036	1845	1807	22908	23133	2685	3256	1830	3463	3662
SEQ–7	2178	1745	1720	1778	21953	22522	2563	3150	1752	3395	3589
SEQ–8	2158	1858	1775	1921	22236	22730	2845	3062	1814	3355	3585
SEQ–9	2203	1766	1726	1830	22060	22362	2748	2724	1743	3305	3609

NOTE: THE FIRST TWO RUNS ARE NOT USED IN THE CALCULATIONS.

2. CONCENTRATIONS (µg/L) and MDL

SEQ #	a–BHC	b–BHC	d–BHC	ALDRIN	g–CHLO	a–CHLO	DDE	ENDRIN	DDD	END SUL	END KET
SEQ–3	0.0177	0.0267	0.0172	0.0197	0.2849	0.2725	0.0448	0.0457	0.0404	0.0521	0.0496
SEQ–4	0.018	0.027	0.0177	0.0195	0.2853	0.2702	0.0499	0.0298	0.0412	0.0495	0.059
SEQ–5	0.0176	0.0263	0.0172	0.0206	0.2823	0.2679	0.0434	0.045	0.0399	0.0515	0.0495
SEQ–6	0.0158	0.0292	0.0176	0.0209	0.2713	0.2727	0.0457	0.0487	0.0409	0.053	0.0517
SEQ–7	0.0174	0.025	0.0164	0.0203	0.26	0.269	0.0422	0.047	0.0383	0.0516	0.0507
SEQ–8	0.0173	0.0266	0.0159	0.0219	0.2638	0.2679	0.0451	0.0457	0.0405	0.0513	0.0503
SEQ–9	0.0176	0.0253	0.0164	0.0209	0.2613	0.2636	0.0436	0.0405	0.0389	0.0506	0.051
S	0.00044	0.00137	0.00052	0.0009	0.00997	0.00315	0.00144	0.00755	0.00093	0.00112	0.00092
MDL	0.0014	0.0043	0.0016	0.0025	0.0115	0.0099	0.0045	0.0237	0.0029	0.0035	0.0134

II. BACK COLUMN (DB-1701)

A. INDA-MDL
1. RAW DATA

RT	11.35	12.12	13.05	15.5	16.42	17.71	20.1	20.58	22.74
ng	0.050	0.050	0.050	0.050	0.050	0.050	0.100	0.150	0.250
INITAL	1501030	1558016	1307822	1253100	1474744	1492401	1585272	1835206	1506072

SEQ #	g-BHC	HEPT	ALDRIN	HEPT EP	ENDO I	DIELD	ENDO II	DDT	METH
SEQ-1	78240	111886	64434	77852	71439	142013	124809	75208	312459
SEQ-2	75857	104760	62797	75933	69055	142155	120432	70458	285410
SEQ-3	74871	103096	63329	75817	69120	141060	122329	75405	325691
SEQ-4	76355	101444	60429	75505	66240	137325	118524	72956	306577
SEQ-5	77391	106312	62205	76266	71569	141952	137786	68436	335381
SEQ-6	75359	101564	60010	75027	67713	136059	113066	72921	296657
SEQ-7	77625	113745	65856	77230	70281	142565	123985	76296	322537
SEQ-8	77307	105713	62596	76382	70562	143570	122377	72559	306610
SEQ-9	71959	105812	60875	72626	65543	130782	113577	69450	267430

NOTE: ALL 9 SET OF DATA ARE USED IN THE CALCULATIONS.

2. CONCENTRATIONS (µg/L) and MDL

SEQ #	g-BHC	HEPT	ALDRIN	HEPT EP	ENDO I	DIELD	ENDO II	DDT	METH
SEQ-1	0.0156	0.0215	0.0143	0.0156	0.0194	0.0363	0.0394	0.0307	0.2429
SEQ-2	0.0152	0.0202	0.0139	0.0154	0.0187	0.0361	0.038	0.0288	0.2229
SEQ-3	0.0149	0.0199	0.014	0.0152	0.0187	0.0378	0.0386	0.0308	0.2532
SEQ-4	0.0151	0.0195	0.0134	0.0151	0.0188	0.0368	0.0374	0.0298	0.2375
SEQ-5	0.0155	0.0209	0.0138	0.0167	0.0194	0.038	0.0435	0.0281	0.2611
SEQ-6	0.0151	0.0198	0.0133	0.018	0.0184	0.0365	0.0372	0.0298	0.2305
SEQ-7	0.0155	0.0219	0.0148	0.0165	0.0191	0.0383	0.0391	0.0312	0.2507
SEQ-8	0.0155	0.0208	0.0139	0.0166	0.0191	0.0385	0.0389	0.0297	0.2383
SEQ-9	0.0144	0.0203	0.0135	0.0174	0.0178	0.035	0.0359	0.0284	0.2312
S	0.00036	0.00063	0.00047	0.00043	0.00051	0.00116	0.00212	0.00228	0.01231
MDL	0.0011	0.0024	0.0014	0.0012	0.0015	0.0034	0.0061	0.0065	0.0355

B. INDB-MDL
1. RAW DATA

RT	9.95	14.16	14.96	13.06	16.57	16.69	17.28	18.39	20.02	22.53	23.67
ng	0.050	0.150	0.100	0.050	0.100	0.100	0.100	0.100	0.170	0.15	0.14
INITAL	1566984	2367320	2192882	1741071	1943473	1972629	1366315	1535019	1701954	2252317	2089035

SEQ #	a-BHC	b-BHC	d-BHC	ALDRIN	g-CHLO	a-CHLO	DDE	ENDRIN	DDD	END SUL	END KET
SEQ-2	67188	110720	53054	60465	672665	698907	61344	91234	52658	251116	121310
SEQ-4	72173	172093	57331	69863	911734	963825	69572	58131	55950	250459	147656
SEQ-1	68459	98025	53155	63052	874251	903221	78665	57097	50943	239373	121525
SEQ-3	72668	95250	60445	64574	936573	968901	68476	108345	53154	276139	130795
SEQ-5	71474	99857	58572	66560	919591	949145	69522	103180	55006	272657	122527
SEQ-6	74520	71532	59370	57949	955151	969397	62857	111554	59353	259057	131987
SEQ-7	74065	71344	58089	58244	916554	955952	62928	105528	51019	261231	123342
SEQ-8	72100	74980	57130	71466	903175	954956	69936	100371	55457	253712	125036
SEQ-9	73085	70277	58732	66708	925240	961532	64961	88880	59228	251391	137223

NOTE: SEQ-2 AND 4 ARE NOT USED IN THE CALCULATIONS.

2. CONCENTRATIONS (µg/L) and MDL

SEQ #	a-BHC	b-BHC	d-BHC	ALDRIN	g-CHLO	a-CHLO	DDE	ENDRIN	DDD	END SUL	END KET
SEQ-1	0.0129	0.0231	0.0121	0.0145	0.2249	0.229	0.0221	0.0318	0.0254	0.0577	0.0407
SEQ-3	0.0137	0.0222	0.0136	0.0149	0.2417	0.2458	0.0253	0.0353	0.0215	0.0918	0.0498
SEQ-5	0.0134	0.0235	0.013	0.0153	0.2388	0.2406	0.0229	0.0336	0.023	0.0936	0.0414
SEQ-6	0.014	0.0242	0.0135	0.0159	0.248	0.2494	0.0239	0.0393	0.0256	0.0953	0.0442
SEQ-7	0.0139	0.0241	0.0129	0.0157	0.2385	0.2422	0.0239	0.0344	0.0235	0.057	0.0413
SEQ-8	0.0135	0.0253	0.013	0.0184	0.2401	0.2419	0.0269	0.0337	0.0257	0.0873	0.0419
SEQ-9	0.0137	0.0237	0.0134	0.0155	0.2408	0.2438	0.0247	0.0293	0.0235	0.0857	0.048
S	0.00037	0.00413	0.00055	0.00092	0.00999	0.00935	0.00227	0.00295	0.00228	0.00338	0.00194
MDL	0.0012	0.0132	0.0018	0.0019	0.021	0.02	0.0071	0.0074	0.0071	0.0106	0.0061

MDL REPORT
(10/22/1991, Caobin Zhu)

ALL ARE IN ug/L units.

I. INDA

	GC 5A	GC 5B
g-BHC	0.0015	0.0011
HEPT	0.0015	0.0024
ALDRIN	0.0018	0.0014
HEPT EP	0.0012	0.0012
ENDO I	0.0017	0.0015
DIELD	0.0033	0.0034
ENDO II	0.0036	0.0061
DDT	0.0030	0.0065
METH	0.0257	0.0356

II. IND B

	GC 5A	GC 5B
a-BHC	0.0014	0.0012
b-BHC	0.0043	0.0132
d-BHC	0.0016	0.0018
ALDRIN	0.0025	0.0019
g-CHLO	0.0115	0.0210
a-CHLO	0.0099	0.0200
DDE	0.0045	0.0071
ENDRIN	0.0237	0.0074
DDD	0.0026	0.0071
END SUL	0.0035	0.0106
END KET	0.0104	0.0061

III. TOXAPHENE

GC 7A	GC 7B
0.4180	0.4847

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METHOD DETECTION LIMIT STUDY

Date: July 1991

The following table shows the Method Detection Limit (MDL) study of Aroclor 1260 as measured on five GC/ECD channels. The spike level of Aroclor 1260 was 0.17 ppb.

Aroclor 1260 ppb

		MDL REPLICATES									
GC#	Column	1	2	3	4	5	6	7	Mean	S	MDL
4	DB-5	.12	.08	.07	.06	.10	.09	.07	.08	.02	.06
4	DB-608	.11	.11	.15	.12	.14	.14	.16	.13	.02	.06
5	DB-608	.05	.07	.10	.10	.06	.08	.08	.08	.02	.06
5	DB-1701	.08	.07	.12	.06	.07	.09	.13	.09	.03	.08
7*	DB-1701	.45	.44	.44	.44	.46	.46	.45	.45	.01	.03

MDL = S (3.143)

S = Standard deviation

3.143 = t(n-1, 1-x = .99) From table of students' t values at the 99 percent confidence level for 7 replicates.

* Spike level 0.48 ppb Aroclor 1260

AR301512

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METHOD DETECTION LIMIT STUDY

Date: November 1, 1991

GC 7
Column DB-1701

MDL REPLICATES (ppb)

Compound	1	2	3	4	5	6	7	MDL
DCPAA	25.7	13.1	20.62	20.51	19.16	18.62	18.72	11.70
DICAMBA	1.40	1.48	1.35	1.42	1.25	1.31	1.28	0.25
2,4-D	5.73	6.53	6.63	6.34	5.60	5.52	5.32	1.68
SILVEX	1.57	1.65	1.51	1.62	1.50	1.52	1.49	0.19
2,4,5-T	1.44	1.80	1.55	1.57	1.40	1.43	1.37	0.45

GC 7
Column DB-608

MDL REPLICATES (ppb)

Compound	1	2	3	4	5	6	7	MDL
DCPAA	21.2	11.20	17.5	17.3	16.43	16.35	16.40	9.23
DICAMBA	1.36	1.39	1.32	1.36	1.20	1.28	1.26	0.21
2,4-D	5.03	5.10	4.82	5.20	4.85	4.94	4.72	0.53
SILVEX	1.50	1.53	1.45	1.52	1.39	1.46	1.44	0.16
2,4,5-T	1.31	1.46	1.28	1.38	1.29	1.33	1.27	0.21

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VOLATILE ORGANICS

MDL STUDY EPA METHOD 524.2 25ML PURGE MAY 10,1991

COMPOUND	B9226	B9227	B9228	B9229	B9232	B9233	B9234	AVG	%REC	STDEV	MDL
DICHLORODIFLUOROMETHANE	0.56	0.59	0.55	0.52	0.46	0.48	0.49	0.52	52	0.05	0.15
CHLOROMETHANE	1.23	0.86	0.75	0.79	0.73	0.77	0.69	0.85	85	0.18	0.58
VINYL CHLORIDE	0.79	0.55	0.75	0.58	0.6	0.63	0.54	0.63	63	0.10	0.31
BROMOMETHANE	1.07	1.03	0.93	0.9	0.84	0.74	0.75	0.89	89	0.13	0.40
CHLOROETHANE	0.67	0.77	0.58	0.57	0.46	0.6	0.67	0.62	62	0.10	0.31
TRICHLOROFLUOROMETHANE	0.75	0.69	0.52	0.57	0.44	0.64	0.56	0.60	60	0.11	0.33
1,1-DICHLOROETHENE	0.85	0.72	0.74	0.76	0.65	0.69	0.6	0.72	72	0.08	0.25
ACETONE	11.37	6.34	6.27	9.71	9.16	10.01	13.07	9.42	314	2.48	7.81
CARBON DISULFIDE	4.32	4.3	3.87	3.65	3.51	3.79	3.55	3.86	129	0.33	1.05
METHYLENE CHLORIDE	5.53	3.66	3.7	7.58	5.67	8.79	9.14	6.30	630	2.26	7.10
TRANS-1,2-DICHLOROETHENE	0.88	0.86	0.86	0.79	0.73	0.66	0.79	0.80	80	0.08	0.25
1,1-DICHLOROETHANE	0.72	0.73	0.67	0.68	0.71	0.63	0.67	0.69	69	0.03	0.11
VINYL ACETATE	3.72	3.69	3.55	4.99	4.62	4.3	5.15	4.29	143	0.65	2.06
2,2-DICHLOROPROPANE	0.68	0.73	0.64	0.6	0.52	0.51	0.52	0.60	60	0.09	0.27
CIS-1,2-DICHLOROETHENE	0.92	0.92	0.85	0.93	0.87	0.84	0.91	0.89	89	0.04	0.12
2-BUTANONE	2.21	1.63	2.77	4.48	5.24	6.88	6.56	4.25	142	2.10	6.61
CHLOROFORM	0.82	0.81	0.76	0.78	0.77	0.82	0.82	0.80	80	0.03	0.08
BROMOCHLOROMETHANE	0.79	0.62	0.59	0.77	0.78	0.93	0.84	0.76	76	0.12	0.37
1,1,1-TRICHLOROETHANE	0.78	0.73	0.75	0.68	0.78	0.64	0.68	0.72	72	0.05	0.17
CARBON TETRACHLORIDE	0.65	0.8	0.73	0.69	0.76	0.61	0.73	0.71	71	0.07	0.20
1,1-DICHLOROPROPENE	0.82	0.77	0.75	0.7	0.67	0.6	0.67	0.71	71	0.07	0.23
BENZENE	0.74	0.81	0.75	0.75	0.66	0.7	0.73	0.75	73	0.05	0.15
1,2-DICHLOROETHANE	0.96	0.82	0.8	1.04	0.94	1.04	1.12	0.96	96	0.12	0.37
TRICHLOROETHENE	1	0.96	0.87	0.85	0.84	0.82	0.87	0.89	89	0.07	0.21
1,2-DICHLOROPROPANE	0.91	0.81	0.81	0.9	0.9	0.94	1.02	0.90	90	0.07	0.23
BROMODICHLOROMETHANE	0.97	0.89	0.86	1.08	1.01	1.16	1.17	1.02	102	0.12	0.39
DIBROMOMETHANE	0.99	0.76	0.72	0.9	0.93	1.05	1.06	0.92	92	0.13	0.42
CIS-1,3-DICHLOROPROPENE	1.46	1.26	1.18	1.45	1.44	1.7	1.69	1.45	97	0.20	0.61
4-METHYL-2-PENTANONE	4.61	4.14	3.68	5.87	6.79	7.68	8.61	5.91	197	1.87	5.88
TOLUENE	0.91	0.93	0.84	0.87	0.85	0.84	0.89	0.88	88	0.04	0.11
TRANS-1,3-DICHLOROPROPEN	0.36	0.34	0.25	0.34	0.38	0.44	0.51	0.37	75	0.08	0.26
1,1,2-TRICHLOROETHANE	1.23	0.76	0.77	1.18	1.1	1.34	1.49	1.13	113	0.27	0.85
TETRACHLOROETHENE	1.22	1.08	1.12	0.94	0.99	0.91	0.89	1.02	102	0.12	0.38
1,3-DICHLOROPROPANE	1.08	0.86	0.8	1.05	1	1.32	1.33	1.06	106	0.20	0.64
2-HEXANONE	5.06	4.22	4.27	7.56	7.49	8.98	9.59	6.74	225	2.22	6.99
DIBROMOCHLOROMETHANE	0.85	0.8	0.82	1.01	0.98	1.25	1.23	0.99	99	0.19	0.59
1,2-DIBROMOETHANE	1.07	0.74	0.7	1.08	1.06	1.27	1.26	1.03	103	0.23	0.71
CHLOROBENZENE	0.91	0.85	0.85	0.89	0.86	0.99	0.95	0.90	90	0.06	0.18
1,1,1,2-TETRACHLOROETHANE	0.96	0.84	0.78	0.91	0.9	1.02	0.93	0.91	91	0.08	0.25
ETHYLBENZENE	0.9	0.91	0.92	0.9	0.82	0.9	0.84	0.88	88	0.04	0.12
M,P-XYLENE	1.8	1.74	1.65	1.68	1.55	1.71	1.74	1.70	85	0.08	0.25
O-XYLENE	0.91	0.84	0.89	0.89	0.88	0.92	0.9	0.89	89	0.03	0.08
STYRENE	1.01	0.9	0.84	1	0.95	1.08	1.02	0.97	97	0.08	0.25
BROMOFORM	0.67	0.7	0.68	0.95	0.9	1.24	1.27	0.94	94	0.23	0.74
ISOPROPYLBENZENE	0.94	0.84	0.83	0.8	0.74	0.81	0.76	0.82	82	0.06	0.20
BROMOBENZENE	1.2	0.91	0.9	1.07	0.98	1.19	1.17	1.06	106	0.13	0.41
1,1,2,2-TETRACHLOROETHANE	1.24	0.84	0.74	1.11	1.16	1.41	1.39	1.13	113	0.26	0.81

MDL STUDY EPA METHOD 524.2 25ML PURGE MAY 10,1991

[illegible]-TRICHLOROPROPANE	1.53	1.15	1.06	1.39	1.36	1.8	1.68	1.42	142	0.27	0.85
N-[illegible]OPYLBENZENE	0.85	0.81	0.84	0.79	0.71	0.76	0.7	0.78	78	0.06	0.18
2-CHLOROTOLUENE	0.83	0.86	0.87	0.91	0.85	0.9	0.84	0.87	87	0.03	0.09
1,3,5,TRIMETHYLBENZENE	0.9	0.94	0.88	0.9	0.83	0.95	0.83	0.89	89	0.05	0.15
4-CHLOROTOLUENE	0.99	0.87	0.84	0.89	0.76	0.9	0.96	0.89	89	0.08	0.24
TERT-BUTYLBENZENE	0.94	0.89	0.82	0.85	0.77	0.87	0.78	0.85	85	0.06	0.19
1,2,4-TRIMETHYLBENZENE	0.94	0.95	0.92	0.9	0.91	0.97	0.98	0.94	94	0.03	0.10
SEC-BUTYLBENZENE	0.83	0.83	0.83	0.76	0.71	0.78	0.71	0.78	78	0.05	0.17
P-ISOPROPYLTOLUENE	0.95	0.91	0.89	0.86	0.81	0.87	0.84	0.88	88	0.05	0.15
1,3-DICHLOROBENZENE	1.05	0.93	0.87	1.05	0.95	1.1	1.04	1.00	100	0.08	0.26
1,4-DICHLOROBENZENE	1.05	0.93	0.87	1.05	0.95	1.1	1.04	1.00	100	0.08	0.26
N-BUTYLBENZENE	0.96	0.96	0.9	0.88	0.8	0.87	0.82	0.88	88	0.06	0.20
1,2-DICHLOROBENZENE	1.26	0.87	0.67	1.06	1.03	1.26	1.21	1.08	108	0.17	0.53
1,2-DIBROMO-3-CHLOROPRO	1.32	0.67	0.57	1.23	0.97	1.42	1.57	1.11	111	0.38	1.20
1,2,4-TRICHLOROBEENZENE	1.45	0.92	0.92	1.25	1.33	1.45	1.33	1.23	123	0.22	0.70
HEXACHLOROBUTADIENE	0.8	0.91	0.86	0.8	0.72	0.78	0.72	0.80	80	0.07	0.22
NAPHTHALENE	1.95	0.85	0.68	1.36	1.37	1.78	1.62	1.43	143	0.45	1.40
1,2,3-TRICHLOROBENZENE	1.77	0.95	1	1.37	1.38	1.6	1.63	1.38	138	0.32	1.00

THE STUDY WAS PERFORMED AS FOLLOWS:

1) Acetone, Carbon Disulfide, Vinyl Acetate, 2-Butanone, 4-Methyl-2-Pentanone, 2-Hexanone spiked at 3 ppb;
m,p-Xylene spiked at 2 ppb;
cis-1,3-dichloropropene at 1.5 ppb;
trans-1,3-dichloropropene at 0.5 ppb;
all other compounds at 1.0 ppb.

2) Calculations:

MDL= STDEV* 3.143(factor for 7 replicates)

ID:MS2
MDL STUDY
VOA TCL 5 ML PURGE
EPA METHOD 8240

DATE:9-25-1991

COMPOUND	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	MDL9	AVG	STDV	MDL
Chloromethane	6.15	5.48	5.14	5.23	4.98	5.41	4.48	4.85	4.28	5.11	0.59	1.61
Bromomethane	5.36	4.74	4.77	4.71	5.00	4.51	3.92	4.28	4.56	4.65	0.43	1.18
Vinyl chloride	5.99	5.44	4.81	5.02	4.69	4.63	4.09	4.61	4.01	4.81	0.65	1.79
Chloroethane	5.56	5.00	3.67	4.29	4.04	4.34	3.39	4.33	4.32	4.33	0.68	1.87
Methylene chloride	5.17	4.97	3.71	4.43	4.14	4.82	4.80	4.48	5.04	4.62	0.50	1.36
Acetone	5.19	5.70	4.48	4.69	6.16	4.55	4.82	5.38	6.87	5.31	0.85	2.33
Carbon disulfide	4.73	4.46	4.00	3.95	3.86	3.63	3.31	3.54	3.42	3.88	0.50	1.36
1,1-Dichloroethene	5.58	5.34	4.71	4.65	4.34	4.02	3.90	4.06	3.58	4.46	0.71	1.94
1,1-Dichloroethane	5.27	5.30	4.49	4.19	4.24	3.96	3.96	4.03	4.17	4.40	0.55	1.52
Trans-1,2-Dichloroethane	4.75	4.40	4.06	3.85	3.87	3.65	3.37	3.50	3.55	3.89	0.47	1.30
Chloroform	5.00	4.64	4.26	4.02	4.03	3.91	3.86	3.95	4.17	4.21	0.40	1.10
2-Butanone	3.01	2.54	3.29	3.26	3.47	3.59	2.82	3.85	4.46	3.37	0.60	1.65
1,1,1-Trichloroethane	4.82	4.46	4.22	3.76	3.62	3.74	3.55	3.47	3.54	3.91	0.50	1.38
1,2-Dichloroethane	4.78	4.60	4.28	3.90	4.22	4.00	3.96	4.13	4.39	4.25	0.31	0.86
Carbon tetrachloride	5.10	4.70	4.32	3.91	4.05	3.88	3.59	3.57	3.62	4.08	0.56	1.53
Vinyl acetate	4.77	4.59	4.05	4.07	4.19	4.42	3.87	4.23	4.18	4.26	0.29	0.81
Bromodichloromethane	3.97	3.69	3.55	3.36	3.37	3.43	3.23	3.27	3.69	3.51	0.25	0.69
1,2-Dichloropropane	5.51	4.97	4.70	4.22	4.36	4.45	4.51	4.62	4.79	4.68	0.40	1.11
cis-1,3-Dichloropropene	7.06	6.75	6.17	5.87	5.90	5.61	5.70	5.88	6.35	6.14	0.52	1.42
Trichloroethene	4.96	4.44	4.12	3.72	3.96	3.74	3.67	3.75	3.96	4.04	0.45	1.23
Dibromochloromethane	3.87	3.84	3.42	3.20	3.27	3.30	3.24	3.35	3.76	3.47	0.28	0.78
1,1,2-Trichloroethane	4.66	4.29	4.00	3.73	4.07	3.81	3.95	3.95	4.42	4.10	0.31	0.87
Benzene	5.07	4.80	4.39	4.20	4.24	4.33	3.96	3.83	4.35	4.35	0.40	1.10
trans-1,3-Dichloropropene	1.55	1.46	1.36	1.31	1.26	1.33	1.30	1.28	1.41	1.36	0.10	0.27
Bromoform	3.56	3.40	3.05	3.02	3.11	3.06	3.08	3.10	3.38	3.19	0.20	0.56
4-Methyl-2-pentanone	5.43	5.19	5.34	5.19	5.66	5.29	5.32	5.26	5.79	5.38	0.22	0.60
2-Hexanone	4.17	4.60	4.33	4.45	4.77	4.55	4.41	4.90	5.96	4.68	0.55	1.52
1,1,2,2-Tetrachloroethane	4.37	4.32	4.14	4.11	4.10	3.86	4.06	4.08	4.47	4.17	0.19	0.53
Tetrachloroethene	5.05	4.63	4.37	3.99	3.88	3.69	3.59	3.66	3.81	4.07	0.53	1.45
Toluene	4.61	4.17	4.22	4.00	3.65	3.52	3.65	3.54	3.92	3.92	0.39	1.06
Chlorobenzene	4.42	4.16	4.03	3.75	3.60	3.38	3.46	3.43	3.82	3.78	0.38	1.04
Ethylbenzene	4.36	4.22	3.74	3.57	3.61	3.40	3.30	3.35	3.65	3.69	0.39	1.07
Styrene	3.97	3.75	3.53	3.45	3.44	3.10	3.18	3.28	3.68	3.49	0.29	0.81
Xylene (Total)	4.32	4.15	3.96	3.67	3.66	3.57	3.40	3.45	3.83	3.78	0.33	0.91

ID:MS3
MDL STUDY
VOA TCL 5ML PURGE
A METHOD 8240

DATE: 09-28-1991

COMPOUND	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	AVG	STDV	MDL
Chloromethane	5.76	4.56	5.09	4.86	4.71	4.88	5.09	4.99	0.39	1.23
Bromomethane	5.23	4.59	4.83	4.58	4.20	3.99	4.29	4.53	0.42	1.31
Vinyl chloride	5.34	4.68	4.87	4.61	3.98	4.17	4.50	4.59	0.45	1.40
Chloroethane	5.30	4.74	4.54	4.52	3.95	3.88	4.32	4.47	0.49	1.53
Methylene chloride	7.04	6.29	7.03	7.96	7.73	6.32	7.40	7.11	0.64	2.03
Acetone	6.42	4.26	7.74	6.47	9.05	6.53	8.37	6.98	1.58	4.96
Carbon disulfide	5.08	4.32	4.63	4.53	3.89	3.95	4.26	4.38	0.41	1.29
1,1-Dichloroethene	5.23	4.56	4.53	4.29	3.95	4.05	4.24	4.41	0.43	1.34
1,1-Dichloroethane	5.02	4.47	4.33	4.60	4.04	4.03	4.17	4.38	0.35	1.12
Trans-1,2-Dichloroethane	4.86	4.12	4.42	4.38	3.89	3.98	3.70	4.19	0.39	1.23
Chloroform	5.29	4.53	4.61	4.95	4.44	4.41	4.46	4.67	0.33	1.04
2-Butanone	3.96	2.65	6.13	5.58	4.79	5.29	6.41	4.97	1.31	4.12
1,1,1-Trichloroethane	4.99	4.31	4.61	4.96	4.57	4.44	5.06	4.70	0.29	0.93
1,2-Dichloroethane	5.20	4.15	4.68	5.08	4.42	4.60	4.77	4.70	0.36	1.13
Carbon tetrachloride	4.81	4.26	4.55	4.34	4.07	4.19	4.91	4.45	0.32	1.00
Vinyl acetate	4.50	4.63	5.88	4.80	5.56	4.25	5.10	4.96	0.59	1.85
Bromodichloromethane	4.59	3.93	4.60	4.78	4.55	4.29	4.63	4.48	0.28	0.89
?-Dichloropropane	4.62	3.91	4.82	4.81	4.68	4.06	4.67	4.51	0.37	1.15
-1,3-Dichloropropene	6.48	5.55	6.27	6.48	7.10	5.83	6.44	6.31	0.50	1.58
chloroethene	4.80	3.97	4.71	4.63	4.31	4.30	4.60	4.47	0.29	0.91
Dibromochloromethane	4.05	3.61	4.45	4.40	4.59	3.90	4.59	4.23	0.38	1.20
1,1,2-Trichloroethane	4.71	4.05	5.00	5.06	5.37	4.55	5.50	4.89	0.50	1.57
Benzene	4.93	4.22	4.47	4.65	4.37	4.05	4.60	4.47	0.29	0.92
trans-1,3-Dichloropropene	1.73	1.69	1.35	1.76	2.04	1.88	1.89	1.76	0.22	0.69
Bromoform	3.79	3.39	4.14	4.21	4.46	3.55	4.55	4.01	0.45	1.40
4-Methyl-2-pentanone	4.19	4.59	7.10	7.55	8.13	7.13	8.81	6.78	1.75	5.49
2-Hexanone	5.20	5.59	6.36	9.69	11.80	8.26	9.49	8.05	2.45	7.69
1,1,2,2-Tetrachloroethane	5.19	4.56	5.29	5.04	6.58	4.98	6.03	5.38	0.69	2.17
Tetrachloroethene	5.78	4.93	5.22	5.33	4.57	4.67	5.04	5.08	0.41	1.29
Toluene	5.25	4.23	5.09	5.03	4.72	4.49	4.68	4.78	0.36	1.14
Chlorobenzene	4.93	4.36	4.80	4.84	4.57	4.41	4.43	4.62	0.23	0.74
Ethylbenzene	5.90	4.88	5.19	5.30	4.87	4.82	5.08	5.15	0.38	1.19
Styrene	5.84	4.92	5.28	4.55	5.04	4.94	5.23	5.11	0.40	1.26
Xylene (Total)	6.61	5.50	5.81	5.84	5.75	5.11	5.85	5.78	0.45	1.42

ID:MS5
MDL STDUY
VOA TCL 5ML PURGE
EPA METHOD 8240

DATE:09-20-1991

COMPOUND	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	AVG	STD	MDL
Chloromethane	3.51	3.56	3.90	3.14	4.56	4.50	4.27	3.81	3.90	0.50	1.51
Bromomethane	4.97	4.82	4.16	4.64	5.42	4.81	5.16	4.34	4.79	0.41	1.24
Vinyl chloride	4.31	3.94	3.91	4.07	4.43	3.74	4.68	3.53	4.08	0.38	1.13
Chloroethane	3.77	3.62	3.47	3.29	3.61	3.10	3.80	3.35	3.50	0.24	0.73
Methylene chloride	4.95	5.45	4.58	5.45	5.30	5.94	5.38	4.67	5.22	0.45	1.35
Acetone	1.96	3.44	2.95	3.68	2.25	3.68	3.49	3.17	3.08	0.65	1.96
Carbon disulfide	4.32	3.91	3.58	3.61	4.57	3.77	4.22	3.23	3.90	0.44	1.33
1,1-Dichloroethene	5.36	5.37	5.33	4.78	5.77	4.77	5.14	4.31	5.10	0.46	1.38
1,1-Dichloroethane	5.33	5.12	5.09	5.34	6.43	4.86	5.16	4.67	5.25	0.53	1.58
Trans-1,2-Dichloroethane	4.40	4.61	3.90	4.18	4.50	4.10	4.94	3.97	4.33	0.35	1.06
Chloroform	4.29	4.15	3.91	4.06	4.78	4.24	4.69	3.95	4.26	0.32	0.96
2-Butanone	1.26	1.17	1.19	1.23	1.25	1.21	1.11	1.20	1.20	0.05	0.15
1,1,1-Trichloroethane	4.38	4.16	3.81	3.91	4.63	3.91	4.43	3.76	4.12	0.32	0.97
1,2-Dichloroethane	4.38	4.36	4.22	4.46	4.89	5.07	5.09	4.38	4.61	0.35	1.05
Carbon tetrachloride	3.66	3.39	3.03	3.16	3.73	3.23	3.71	2.85	3.34	0.33	1.00
Vinyl acetate	3.40	2.61	3.41	2.90	3.90	3.71	3.48	3.87	3.41	0.45	1.36
Bromodichloromethane	4.05	3.92	3.85	3.84	4.28	3.77	4.39	3.87	4.00	0.23	0.68
1,2-Dichloropropane	4.50	4.23	4.57	4.90	5.74	4.64	5.37	4.90	4.86	0.49	1.47
cis-1,3-Dichloropropene	6.74	6.59	6.37	6.25	7.12	6.59	7.19	6.63	6.69	0.33	0.99
Trichloroethene	4.14	3.87	3.73	3.54	4.23	3.77	4.08	3.50	3.86	0.27	0.81
Dibromochloromethane	3.74	3.66	3.45	3.46	3.56	3.59	4.00	3.68	3.64	0.18	0.53
1,1,2-Trichloroethane	3.98	4.12	3.95	3.87	4.18	4.31	4.78	4.15	4.17	0.29	0.85
Benzene	4.50	4.41	4.24	4.37	5.10	4.63	4.84	4.25	4.54	0.30	0.90
trans-1,3-Dichloropropene	1.59	1.74	1.58	1.76	1.69	1.79	1.93	1.83	1.74	0.12	0.36
Bromoform	2.86	2.64	2.48	2.64	2.42	2.75	3.04	2.79	2.70	0.20	0.60
4-Methyl-2-pentanone	1.75	1.81	1.96	2.06	1.58	2.04	2.67	2.31	2.02	0.34	1.03
2-Hexanone	1.49	1.47	1.84	1.52	2.21	1.85	2.25	2.34	1.87	0.36	1.08
1,1,2,2-Tetrachloroethane	2.71	2.76	2.58	2.60	2.4	2.91	3.22	2.87	2.77	0.23	0.70
Tetrachloroethene	4.46	3.95	3.64	3.78	4.	3.56	4.19	3.45	3.89	0.35	1.04
Toluene	4.53	4.25	4.15	4.15	4.7	4.32	4.74	4.07	4.37	0.27	0.80
Chlorobenzene	4.38	4.13	3.86	3.90	4.39	4.00	4.50	3.97	4.14	0.25	0.75
Ethylbenzene	4.41	4.40	4.17	4.21	4.81	4.32	4.79	4.05	4.39	0.28	0.84
Styrene	4.49	4.37	4.29	4.34	4.96	4.52	4.89	4.33	4.52	0.26	0.78
Xylene (Total)	4.76	4.60	4.31	4.32	5.17	4.68	5.19	4.40	4.68	0.35	1.05

ID: MS6
MDL STUDY
'''OA TCL 5 ML PURGE
A METHOD 8240

DATE:07-15-1991

COMPOUND	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	AVG	STDV	MDL
Chloromethane	9.52	9.75	11.98	11.58	10.05	7.91	9.36	10.02	1.38	4.29
Bromomethane	5.19	4.87	5.67	4.94	4.91	4.48	4.83	4.98	0.37	1.12
Vinyl chloride	4.12	3.87	4.80	4.15	3.98	4.03	4.08	4.15	0.30	0.95
Chloroethane	4.10	4.15	4.40	4.11	4.15	4.00	3.90	4.11	0.15	0.48
Methylene chloride	9.24	8.40	8.75	9.51	9.06	8.75	8.64	8.91	0.38	1.11
Acetone	5.30	4.24	4.21	4.71	4.96	4.41	4.83	4.67	0.41	0.93
Carbon disulfide	4.51	4.42	4.87	4.80	4.34	3.69	3.78	4.34	0.46	1.42
1,1-Dichloroethene	5.32	5.17	5.79	5.32	5.15	5.10	5.09	5.28	0.24	0.76
1,1-Dichloroethane	5.20	4.92	5.70	5.05	4.91	4.54	4.93	5.04	0.35	1.08
Trans-1,2-Dichloroethane	5.01	4.46	5.12	4.15	4.40	4.51	4.51	4.59	0.35	0.92
Chloroform	5.52	5.22	5.99	5.54	5.09	4.75	5.15	5.32	0.40	1.22
1,1,1-Trichloroethane	5.37	5.45	6.28	5.89	5.24	5.31	5.48	5.57	0.38	1.15
1,2-Dichloroethane	4.83	4.71	5.19	5.05	4.88	4.28	4.53	4.78	0.31	0.96
Carbon tetrachloride	6.61	6.30	6.94	6.86	5.94	6.19	6.56	6.49	0.36	1.13
Vinyl acetate	3.62	3.22	3.73	3.81	3.21	3.14	3.24	3.42	0.29	0.86
Bromodichloromethane	4.78	4.68	5.40	5.15	4.51	4.63	4.65	4.83	0.32	1.02
1,2-Dichloropropane	5.17	4.74	5.31	5.69	4.90	4.79	4.95	5.08	0.34	1.06
-1,3-Dichloropropene	7.07	6.88	7.80	7.46	7.08	6.73	6.87	7.13	0.38	1.18
hloroethene	6.09	5.72	6.51	6.31	5.79	5.66	6.01	6.01	0.32	0.99
Dibromochloromethane	5.03	4.69	5.19	5.34	4.86	4.67	4.80	4.94	0.26	0.80
1,1,2-Trichloroethane	4.97	4.41	4.99	4.97	4.65	4.50	4.47	4.71	0.26	0.74
Benzene	4.50	4.46	4.89	4.85	4.28	4.21	4.35	4.51	0.27	0.84
trans-1,3-Dichloropropene	1.80	1.81	2.04	2.18	1.93	1.78	1.80	1.90	0.15	0.46
Bromoform	4.23	3.91	4.41	4.44	3.95	3.79	3.75	4.07	0.29	0.87
4-Methyl-2-pentanone	4.13	3.53	4.15	3.98	3.55	3.54	3.33	3.74	0.33	0.91
2-Hexanone	5.44	4.34	4.36	4.71	3.84	3.37	4.06	4.30	0.66	1.37
1,1,2,2-Tetrachloroethane	4.39	3.91	4.23	4.28	3.87	3.71	3.54	3.99	0.32	0.83
Tetrachloroethene	7.21	6.79	7.91	7.67	6.88	6.81	6.87	7.16	0.46	1.43
Toluene	4.89	5.04	5.21	5.06	4.60	4.46	4.71	4.85	0.27	0.85
Chlorobenzene	5.80	5.54	6.25	5.86	5.53	5.53	5.52	5.72	0.27	0.86
Ethylbenzene	6.14	5.75	6.48	6.05	5.76	5.55	5.57	5.90	0.34	1.02
Styrene	4.94	4.83	5.48	5.14	4.81	4.66	4.77	4.95	0.28	0.88
Xylene (Total)	5.69	5.13	6.28	6.36	5.58	5.58	5.60	5.74	0.43	1.36

ID:MS7
MSL STUDY
VOA TCL 5ML PURGE
EPA METHOD 8240

DATE:07-15-1991

COMPOUND	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	AVG	STDV	MDL
Chloromethane	5.94	6.53	5.06	5.49	5.22	6.13	4.94	5.61	0.60	1.88
Bromomethane	5.15	5.40	5.21	7.39	6.65	4.59	5.14	5.65	0.99	3.12
Vinyl chloride	4.82	5.66	5.35	7.31	5.58	4.83	4.07	5.38	1.02	3.19
Chloroethane	5.76	5.32	4.77	7.30	6.73	5.34	5.30	5.79	0.90	2.84
Methylene chloride	10.30	8.48	8.17	6.87	7.39	7.46	7.56	8.03	1.13	3.55
Acetone	12.18	10.42	11.34	11.35	12.12	10.38	11.47	11.32	0.72	2.25
Carbon disulfide	4.52	4.88	4.39	7.28	6.44	4.49	4.31	5.19	1.18	3.72
1,1-Dichloroethene	4.90	5.22	4.76	7.58	6.96	4.18	4.14	5.39	1.35	4.25
1,1-Dichloroethane	4.71	5.08	4.82	7.91	6.87	4.64	4.57	5.51	1.33	4.17
Trans-1,2-Dichloroethane	4.76	5.60	4.90	7.72	6.46	5.09	5.01	5.65	1.08	3.40
Chloroform	4.71	5.34	4.75	7.64	6.93	4.67	4.42	5.49	1.27	3.99
1,1,1-Trichloroethane	6.01	6.24	5.36	8.13	7.20	5.71	5.77	6.34	0.98	3.08
1,2-Dichloroethane	5.91	5.89	5.53	8.45	7.72	5.77	5.50	6.39	1.18	3.71
Carbon tetrachloride	4.37	4.76	4.43	7.46	6.45	4.38	4.49	5.19	1.25	3.91
Vinyl acetate	5.30	4.81	4.21	6.36	6.57	4.73	3.37	5.05	1.14	3.58
Bromodichloromethane	4.89	5.01	4.76	7.08	6.51	4.87	4.89	5.43	0.95	2.98
1,2-Dichloropropane	5.09	4.92	4.43	7.71	6.72	4.91	4.66	5.49	1.23	3.87
cis-1,3-Dichloropropene	7.99	8.26	7.71	11.17	10.00	7.56	7.81	8.64	1.39	4.35
Trichloroethene	4.76	5.06	4.65	7.46	6.44	4.81	4.82	5.43	1.08	3.41
Dibromochloromethane	4.28	4.43	4.18	7.17	6.05	4.39	4.17	4.95	1.18	3.72
1,1,2-Trichloroethane	5.12	5.34	5.03	7.76	6.78	4.67	5.32	5.72	1.12	3.52
Benzene	4.89	5.41	5.31	7.37	6.46	5.09	5.09	5.66	0.91	2.87
trans-1,3-Dichloropropene	2.51	2.39	2.09	3.16	3.14	2.23	2.23	2.54	0.44	1.38
Bromoform	4.24	4.38	4.28	6.31	5.86	4.55	4.31	4.85	0.86	2.70
4-Methyl-2-pentanone	5.88	6.31	6.54	7.10	6.73	6.00	6.44	6.43	0.42	1.31
2-Hexanone	7.42	7.25	9.06	8.21	5.81	6.53	7.00	7.33	1.07	3.35
1,1,2,2-Tetrachloroethane	4.98	5.13	4.58	7.22	6.11	4.73	4.41	5.31	1.01	3.17
Tetrachloroethene	4.31	5.08	4.54	7.44	6.55	4.88	4.36	5.31	1.21	3.80
Toluene	5.12	5.24	4.81	7.79	6.68	5.09	4.96	5.67	1.12	3.53
Chlorobenzene	4.87	4.93	4.58	7.40	6.64	4.70	4.57	5.38	1.15	3.61
Ethylbenzene	5.87	5.91	6.18	7.98	7.10	6.49	5.96	6.50	0.78	2.46
Styrene	5.16	5.38	4.99	7.91	6.67	5.19	4.98	5.75	1.12	3.51
Xylene (Total)	5.32	5.99	4.91	8.12	6.10	4.62	5.72	5.82	1.06	3.34

Date 10/30/91

Method Detection Limition Study for
Method 8010 at 1.0000 PPB Standard Concentration is 5.0000 ppb

COMPOUND	STD.AREA E-5	AREA1 E-5	AREA2 E-5	AREA3 E-5	AREA4 E-5	AREA5 E-5	AREA6 E-5	AREA7 E-5	RF-STD E-5
Chloromethane	4.6711	0.8996	0.9958	0.9418	0.7255	0.9755	1.2576	0.9366	0.9742
Vinyl Chloride	7.4781	1.8788	1.8444	1.5176	1.4692	1.3381	1.5678	1.3577	1.4956
Bromomethane	2.0875	0.4163	0.4717	0.3670	0.2762	0.3395	0.3781	0.4332	0.4175
Chloroethane	6.8044	1.3553	1.4148	1.2846	1.0635	1.1703	1.1223	1.2907	1.3609
Trichlorofluoromethane	7.7904	1.6950	1.7276	1.3986	0.9273	1.0506	1.4031	1.5653	1.5581
1,1-Dichloroethene	6.6973	1.2591	1.3692	1.0914	0.9635	0.8274	0.9265	1.2626	1.3395
Methylene Chloride	37.1680	8.2895	9.3713	9.3742	7.4531	7.3427	7.7666	6.8402	7.4336
trans-1,2-Dichloroethene	7.3506	1.4368	1.4316	1.5338	1.3120	1.2251	1.0146	1.2768	1.4701
1,1-Dichloroethane	5.2323	0.8312	0.8468	0.7374	0.8080	0.7972	0.6384	0.7424	1.0465
Chloroform	5.9079	0.8773	0.9254	0.9568	0.9293	0.9397	0.7332	0.9109	1.1816
* Bromochloromethane	3.7651	0.7406	0.7139	0.7309	0.6924	0.7366	0.5992	0.6902	0.7530
1,1,1-Trichloroethane	5.0882	0.9401	0.8718	0.8794	0.7932	0.8398	0.6887	0.8159	1.0176
Carbon Tetrachloride	4.9002	0.9408	0.8285	0.8338	0.7186	0.7565	0.6307	0.7701	0.9800
1,2-Dichloroethane	3.7709	0.8553	0.8277	0.8308	0.7253	0.8136	0.5887	0.7256	0.7542
Trichloroethene	4.4711	0.7367	0.7766	0.7189	0.9440	0.7087	0.5849	0.7619	0.8942
1,2-Dichloropropane	4.4198	0.6517	0.6440	0.8387	0.8417	0.6716	0.5346	0.6526	0.8840
Bromodichloromethane	4.1471	0.6565	0.6387	0.6929	0.7224	0.6496	0.4907	0.6304	0.8294
2-Chloroethylvinyl ether	0.3925	0.0946	0.0792	0.0853	0.0655	0.0522	0.0763	0.0672	0.0785
cis-1,3-Dichloropropene	6.2561	1.3249	1.3748	1.4656	1.4393	1.2781	1.0344	1.2695	1.6512
trans-1,3-Dichloropropene	1.8227	0.2766	0.2858	0.2686	0.2776	0.2683	0.1886	0.2701	0.3645
1,1,2-Trichloroethane	6.4159	1.1096	1.1308	1.6520	1.1226	1.0983	0.7971	1.1081	1.2832
Tetrachloroethene	6.8487	1.5874	1.6550	1.6795	1.4899	1.4657	1.1615	1.6133	1.3697
Dibromochloromethane	3.6452	0.6747	0.7524	0.5681	0.6576	0.7088	0.5237	0.7394	0.7290
Chlorobenzene	2.7525	0.4335	0.5607	0.5058	0.4399	0.4515	0.3411	0.4870	0.5505
Bromoform	2.2690	0.3596	0.3604	0.3921	0.3349	0.3118	0.3027	0.3496	0.4538
1,1,2,2-Tetrachloroethene	5.1679	1.0138	1.0128	1.0340	1.0269	0.9156	0.7630	0.9670	1.0336
1,3-Dichlorobenzene	4.2736	0.7585	0.7526	0.7130	0.7590	0.6851	0.5050	0.7507	0.8547
1,4-Dichlorobenzene	4.7233	1.0018	1.0211	1.1631	1.0001	0.9280	0.7158	0.9825	0.9447
1,2-Dichlorobenzene	4.4936	0.8665	0.9260	1.1325	0.9903	0.8094	0.6106	0.8885	0.8987

	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	AVG	STDV	MDL
Chloromethane	0.9234	1.0221	0.9667	0.7447	1.0013	1.2909	0.9613	0.9872	0.1621	0.5094
Vinyl Chloride	1.2562	1.2332	1.0147	0.9823	0.8947	1.0483	0.9078	1.0482	0.1450	0.4559
Bromomethane	0.9972	1.1299	0.8790	0.6615	0.8132	0.9056	1.0375	0.9177	0.1549	0.4867
Chloroethane	0.9959	1.0396	0.9439	0.7815	0.8600	0.8247	0.9484	0.9134	0.0940	0.2955
Trichlorofluoromethane	1.0879	1.1088	0.8976	0.5951	0.6743	0.9005	1.0046	0.8956	0.1973	0.6202
1,1-Dichloroethene	0.9400	1.0222	0.8148	0.7193	0.6177	0.6917	0.9426	0.8212	0.1516	0.4764
Methylene Chloride	1.1151	1.2607	1.2611	1.0026	0.9878	1.0448	0.9202	1.0846	0.1340	0.4213
trans-1,2-Dichloroethene	0.9773	0.9738	1.0433	0.8924	0.8333	0.6901	0.8685	0.8970	0.1165	0.3662
1,1-Dichloroethane	0.7943	0.8092	0.7047	0.7721	0.7618	0.6101	0.7095	0.7374	0.0686	0.2156
Chloroform	0.7425	0.7832	0.8097	0.7865	0.7953	0.6205	0.7709	0.7584	0.0643	0.2021
* Bromochloromethane	0.9835	0.9480	0.9706	0.9195	0.9781	0.7957	0.9166	0.9303	0.0651	0.2048
1,1,1-Trichloroethane	0.9238	0.8567	0.8641	0.7794	0.8253	0.6768	0.8018	0.8183	0.0781	0.2454
Carbon Tetrachloride	0.9600	0.8454	0.8508	0.7333	0.7719	0.6435	0.7858	0.7986	0.1001	0.3147
1,2-Dichloroethane	1.1341	1.0974	1.1016	0.9617	1.0787	0.7806	0.9621	1.0166	0.1246	0.3915
Trichloroethene	0.8238	0.8685	0.8039	1.0557	0.7925	0.6541	0.8520	0.8358	0.1195	0.3757
1,2-Dichloropropane	0.7372	0.7285	0.9488	0.9522	0.7598	0.6048	0.7383	0.7814	0.1261	0.3965
Bromodichloromethane	0.7915	0.7701	0.8354	0.8709	0.7832	0.5916	0.7601	0.7718	0.0885	0.2782
2-Chloroethylvinyl ether	1.2055	1.0084	1.0861	0.8342	0.6645	0.9715	0.8562	0.9466	0.1786	0.5612
cis-1,3-Dichloropropene	0.8024	0.8326	0.8876	0.8717	0.7740	0.6264	0.7688	0.7948	0.0870	0.2736
trans-1,3-Dichloropropene	0.7589	0.7841	0.7368	0.7615	0.7360	0.5173	0.7409	0.7194	0.0907	0.2852
1,1,2-Trichloroethane	0.8647	0.8812	1.2874	0.8749	0.8559	0.6212	0.8636	0.8927	0.1970	0.6193
Tetrachloroethene	1.1589	1.2083	1.2261	1.0877	1.0701	0.8480	1.1778	1.1110	0.1297	0.4075
Dibromochloromethane	0.9255	1.0320	0.7793	0.9021	0.9722	0.7183	1.0142	0.9062	0.1181	0.3711
Chlorobenzene	0.7874	1.0186	0.9188	0.7991	0.8201	0.6196	0.8846	0.8354	0.1247	0.3920
Bromoform	0.7924	0.7942	0.8640	0.7380	0.6870	0.6570	0.7703	0.7590	0.0678	0.2132
1,1,2,2-Tetrachloroethene	0.9809	0.9799	1.0004	0.9935	0.8859	0.7382	0.9356	0.9306	0.0938	0.2949
1,3-Dichlorobenzene	0.8874	0.8805	0.8342	0.8881	0.8015	0.5908	0.8782	0.8230	0.1074	0.3376
1,4-Dichlorobenzene	1.0605	1.0809	1.2312	1.0587	0.9824	0.7577	1.0400	1.0302	0.1422	0.4469
1,2-Dichlorobenzene	0.9642	1.0303	1.2601	1.1019	0.9006	0.6794	0.9886	0.9893	0.1790	0.5626

date:10/30/91

Method Detection Limition Study for

Method 8020 at 1.00 PPB Standard Conc. 5.00 ppb
2.00 PPB DFB

Compound	STD.AREA	AREA1	AREA2	AREA3	AREA4	AREA5	AREA6	AREA7	RF-STD
Benzene	10258.00	2915.00	2453.00	2349.00	2429.00	2258.00	2250.00	2351.00	2051.60
Difluorobenzene	5690.00	1931.00	1862.00	1908.00	1954.00	1940.00	1994.00	1815.00	1138.00
Toluene	28031.00	5539.00	4475.00	4500.00	4470.00	4296.00	4309.00	4343.00	5606.20
Chlorobenzene	20498.00	4445.00	4067.00	3958.00	3868.00	3722.00	3849.00	3831.00	4099.60
Ethylbenzene	24658.00	4678.00	3862.00	3869.00	3796.00	3640.00	3713.00	3746.00	4931.60
m-Xylene	30472.00	5209.00	4353.00	4362.00	4349.00	4064.00	4187.00	4128.00	6094.40
o-Xylene	23123.00	4307.00	3376.00	3342.00	3331.00	3202.00	3204.00	3209.00	4624.60
3-Dichlorobenzene	24779.00	7015.00	8764.00	7937.00	9520.00	8271.00	8126.00	9833.00	4955.80
4-Dichlorobenzene	23876.00	4871.00	4523.00	4210.00	4106.00	3736.00	3910.00	4354.00	4775.20
2-Dichlorobenzene	19448.00	4102.00	5080.00	3680.00	3619.00	3264.00	4712.00	3794.00	3889.60

	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	AVG	STDV	MDL
Benzene	1.42	1.20	1.14	1.18	1.10	1.10	1.15	1.18	0.11	0.35
Difluorobenzene	3.39	3.27	3.35	3.43	3.41	3.50	3.19	3.37	0.11	0.33
Toluene	0.99	0.80	0.80	0.80	0.77	0.77	0.77	0.81	0.08	0.25
Chlorobenzene	1.08	0.99	0.97	0.94	0.91	0.94	0.93	0.97	0.06	0.18
Ethyl Benzene	0.95	0.78	0.78	0.77	0.74	0.75	0.76	0.79	0.07	0.22
m-Xylene	0.85	0.71	0.72	0.71	0.67	0.69	0.68	0.72	0.06	0.20
o-Xylene	0.93	0.73	0.72	0.72	0.69	0.69	0.69	0.74	0.09	0.27
3-Dichlorobenzene	1.42	1.77	1.60	1.92	1.67	1.64	1.98	1.71	0.19	0.61
4-Dichlorobenzene	1.02	0.95	0.88	0.86	0.78	0.82	0.91	0.89	0.08	0.25
2-Dichlorobenzene	1.05	1.31	0.95	0.93	0.84	1.21	0.98	1.04	0.17	0.52

SEMI-VOLATILE ORGANICS

: MS10 : Date : 9-18-1991
DL STUDY
NA-COMPOUNDS at 5ppb

OMPOUND	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	MDL9	AVG	STD	MDL
henol	5.02	4.70	5.08	4.67	4.29	4.95	4.28	4.42	4.94	4.71	0.31	0.91
s(2-chloroethyl)ether	7.03	6.67	7.46	6.98	6.22	6.51	6.13	6.57	7.36	6.78	0.46	1.34
-Chlorophenol	7.45	6.65	7.80	7.34	6.37	6.81	7.00	6.70	7.34	7.05	0.46	1.34
3-Dichlorobenzene	6.13	6.02	6.80	6.40	5.52	5.99	5.01	5.80	6.36	6.00	0.53	1.52
4-Dichlorobenzene	6.57	6.26	7.04	6.64	5.75	6.25	5.39	6.16	6.64	6.30	0.50	1.45
enzyl alcohol	5.86	5.84	6.45	5.77	5.46	5.60	5.39	5.68	6.21	5.80	0.34	0.99
2-Dichlorobenzene	6.73	6.49	7.29	7.01	6.19	6.57	5.83	6.55	7.08	6.65	0.45	1.31
-Methylphenol	6.39	6.15	6.53	6.39	5.64	6.16	5.84	5.92	6.42	6.16	0.30	0.88
s(2-chloroisopropyl)ether	8.53	8.61	9.98	9.75	8.81	9.68	8.69	9.83	10.95	9.42	0.82	2.37
-Methylphenol	6.48	6.17	6.70	6.11	5.69	5.98	5.77	6.07	6.50	6.16	0.34	0.98
-Nitrosodi-n-propylamine	7.69	7.50	8.23	7.94	7.26	7.68	6.85	7.72	8.68	7.73	0.53	1.54
exachloroethane	5.73	5.62	6.02	5.80	4.75	5.53	4.58	5.45	5.73	5.47	0.48	1.40
itrobenzene	7.37	7.49	8.00	7.94	6.89	7.38	6.78	7.34	8.18	7.49	0.48	1.40
ophorone	8.09	8.10	8.60	8.60	7.45	8.08	7.32	8.14	8.81	8.11	0.47	1.37
-Nitrophenol	5.70	5.73	6.25	6.02	5.05	5.65	5.74	5.80	5.43	5.68	0.34	0.98
,4-Dimethylphenol	5.70	5.14	5.06	5.45	4.81	4.80	4.68	3.42	5.34	4.91	0.67	1.93
is(2-chloroethoxy)methane	7.58	7.48	8.03	7.90	6.82	7.43	6.93	7.51	8.05	7.52	0.44	1.26
,4-Dichlorophenol	6.57	6.38	6.79	6.80	6.08	6.51	6.49	6.16	6.89	6.52	0.28	0.82
,2,4-Trichlorobenzene	6.63	6.72	7.40	7.35	6.29	6.99	5.96	6.54	7.30	6.80	0.50	1.45
aphthalene	7.31	7.11	7.73	7.58	6.65	7.20	6.34	7.04	7.70	7.18	0.47	1.36
-Chloroaniline	7.41	7.63	7.95	8.04	6.80	7.72	6.81	7.29	8.29	7.55	0.52	1.51
exachlorobutadiene	6.72	6.81	7.50	7.26	6.50	6.97	5.87	7.01	6.97	6.85	0.47	1.35
-Chloro-3-methylphenol	6.88	6.91	7.11	7.25	5.95	6.72	6.50	6.70	7.24	6.81	0.41	1.19
-Methylnaphthalene	6.79	6.86	7.31	7.04	6.20	6.89	5.79	6.58	7.22	6.74	0.49	1.41
exachlorocyclopentadiene	3.61	2.98	3.38	3.75	2.82	2.91	2.46	3.29	3.60	3.20	0.43	1.25
,4,6-Trichlorophenol	6.69	6.52	6.94	7.02	6.18	6.55	6.52	6.60	6.92	6.66	0.27	0.77
,4,5-Trichlorophenol	6.65	6.40	6.73	6.75	5.89	6.24	6.31	6.19	6.41	6.40	0.28	0.81
-Chloronaphthalene	7.48	7.33	7.48	7.41	6.47	7.28	6.29	7.06	7.64	7.16	0.47	1.37
Nitroaniline	4.90	5.17	5.39	5.39	4.51	5.12	4.57	5.61	6.11	5.20	0.51	1.47
hyl phthalate	6.17	6.13	6.13	6.19	4.98	5.45	5.03	6.06	6.87	5.89	0.62	1.79
naphthylene	7.47	7.35	7.42	7.53	6.78	7.32	6.41	7.16	7.72	7.24	0.41	1.18
-Nitroaniline	5.28	5.26	5.51	5.42	4.79	5.18	4.81	5.75	5.80	5.31	0.36	1.04
cenaphthene	7.62	7.71	7.66	7.84	7.01	7.49	6.76	7.47	8.13	7.52	0.42	1.21
)ibenzofuran	7.36	7.28	7.38	7.41	6.36	6.82	6.30	6.92	7.41	7.03	0.45	1.30
2,4-Dinitrotoluene	5.58	5.50	5.61	5.70	4.76	5.05	4.56	5.30	5.75	5.31	0.43	1.24
2,6-Dinitrotoluene	5.68	5.62	5.91	5.99	4.95	5.51	4.83	5.58	6.11	5.57	0.44	1.27
)iethyl phthalate	7.70	7.52	7.80	7.70	6.39	6.92	6.56	7.44	7.97	7.33	0.57	1.65
4-Chlorophenyl phenyl ether	7.80	7.87	7.89	8.16	7.00	7.39	6.94	7.80	8.30	7.68	0.48	1.38
Fluorene	8.22	7.89	8.15	7.94	6.96	7.61	7.01	7.74	8.36	7.76	0.50	1.45
4-Nitroaniline	4.99	4.90	5.43	5.35	4.27	4.87	4.25	5.52	5.81	5.04	0.54	1.56
N-Nitrosodiphenylamine	8.51	8.45	8.49	8.71	7.71	8.31	7.40	8.48	9.03	8.34	0.50	1.44
4-Bromophenyl phenyl ether	8.15	8.05	8.06	8.34	7.56	8.02	6.98	8.20	8.55	7.99	0.46	1.35
Hexachlorobenzene	9.02	9.02	8.87	9.33	7.93	8.84	7.91	9.15	9.49	8.82	0.56	1.63
Pentachlorophenol	3.26	2.90	3.39	5.24	3.27	3.48	2.55	2.26	3.72	3.34	0.85	2.46
Phenanthrene	8.46	8.33	8.54	8.56	7.48	8.18	7.24	8.24	8.70	8.19	0.50	1.45
Anthracene	8.58	8.42	8.60	8.61	7.73	7.99	7.30	8.67	9.02	8.32	0.54	1.56
Di-n-butylphthalate	8.20	8.32	8.50	8.58	7.52	7.97	7.54	8.59	8.83	8.23	0.47	1.35
Fluoranthene	8.20	8.21	8.58	8.50	7.37	7.93	7.32	8.40	8.96	8.16	0.55	1.58
Pyrene	6.98	6.83	7.01	6.93	5.91	6.57	5.93	6.84	7.19	6.69	0.47	1.35
Butyl benzyl phthalate	6.34	6.45	6.62	6.65	5.70	6.12	5.76	6.86	7.20	6.41	0.49	1.43
3,3'-Dichlorobenzidine	5.84	6.03	6.40	6.95	5.61	6.57	5.70	7.27	8.01	6.49	0.80	2.32
Benzo(a)anthracene	6.98	6.92	6.98	7.05	5.95	6.47	6.09	6.84	7.22	6.72	0.45	1.29
Bis(2-ethylhexyl)phthalate	6.75	6.96	7.21	8.33	6.18	6.46	6.49	7.67	7.68	7.08	0.70	2.04
Chrysene	7.65	7.44	7.67	7.82	6.56	7.04	6.70	7.52	8.06	7.39	0.51	1.48
Di-n-octylphthalate	6.32	6.85	7.21	9.96	6.04	6.33	6.94	8.95	7.58	7.35	1.31	3.79
Benzo(b)fluoranthene	7.26	7.11	7.12	7.25	6.19	6.66	6.27	7.34	7.60	7.02	0.52	1.42
Benzo(k)fluoranthene	7.24	7.37	7.75	7.90	6.65	6.79	6.58	7.33	7.87	7.27	0.51	1.48
Benzo(a)pyrene	6.97	6.79	6.92	6.90	6.12	6.45	6.18	6.86	7.41	6.73	0.41	1.20
Indeno(1,2,3-cd)pyrene	6.08	5.58	5.71	5.83	5.09	5.44	4.89	5.58	5.81	5.56	0.37	1.08
Dibenzo(a,h)anthracene	7.26	6.35	6.45	6.73	5.62	6.09	5.59	6.53	6.93	6.39	0.56	1.62
Benzo(g,h,i)perylene	6.36	5.58	5.59	5.72	4.86	5.46	4.82	5.62	5.94	5.55	0.48	1.40

ID: MS1
MDL STUDY
BNA–COMPOUNDS at 5ppb

DATE: 9–23–1991

OUND	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	AVG	STDV	MDL
Phenol	5.07	4.57	4.31	4.66	4.89	4.46	4.01	3.92	4.48	0.39	1.19
Bis(2–chloroethyl)ether	7.82	6.89	7.65	7.56	6.51	7.29	6.49	6.94	7.14	0.51	1.53
2–Chlorophenol	7.47	7.08	7.58	7.60	6.41	7.06	7.05	6.92	7.14	0.39	1.19
1,3–Dichlorobenzene	6.27	6.14	6.72	6.78	5.85	6.23	5.35	6.12	6.18	0.45	1.37
1,4–Dichlorobenzene	6.50	6.36	7.10	6.88	5.95	6.59	5.66	6.34	6.42	0.46	1.40
Benzyl alcohol	6.11	5.86	5.99	5.92	5.56	5.84	5.03	5.47	5.72	0.35	1.05
1,2–Dichlorobenzene	7.05	6.81	7.35	7.30	6.32	6.91	5.92	6.71	6.79	0.48	1.45
2–Methylphenol	6.61	6.39	6.33	6.63	5.95	6.36	6.07	6.08	6.30	0.25	0.75
Bis(2–chloroisopropyl)ether	7.22	6.83	7.22	7.24	6.31	6.86	6.08	6.60	6.79	0.43	1.31
4–Methylphenol	6.19	5.84	5.99	5.65	5.50	5.74	5.45	5.44	5.72	0.27	0.81
N–Nitrosodi–n–propylamine	7.22	6.97	7.18	6.64	6.24	6.70	5.85	6.65	6.67	0.46	1.38
Hexachloroethane	6.43	6.31	6.87	6.45	6.00	6.34	5.57	6.24	6.27	0.37	1.12
Nitrobenzene	7.68	7.21	7.89	7.98	6.88	7.32	6.85	6.97	7.34	0.45	1.35
Isophorone	8.19	7.69	8.44	8.05	7.21	7.59	6.57	7.36	7.66	0.60	1.81
2–Nitrophenol	6.47	6.21	6.86	6.75	5.91	5.94	5.91	5.85	6.23	0.40	1.22
2,4–Dimethylphenol	4.09	3.67	2.96	3.83	3.46	3.30	3.12	2.51	3.36	0.50	1.52
Bis(2–chloroethoxy)methane	7.58	6.99	7.58	7.64	6.81	7.07	6.49	6.90	7.13	0.42	1.26
2,4–Dichlorophenol	6.29	5.73	6.14	6.40	5.65	5.71	5.66	5.85	5.92	0.30	0.91
1,2,4–Trichlorobenzene	6.96	6.26	6.94	6.62	6.21	6.45	5.38	6.33	6.39	0.50	1.50
Naphthalene	8.28	7.16	7.76	7.63	6.96	7.25	6.49	7.13	7.33	0.54	1.63
4–Chloroaniline	7.33	6.17	6.03	6.20	5.90	6.69	4.95	5.63	6.11	0.70	2.10
Hexachlorobutadiene	6.39	5.98	6.76	6.19	5.71	6.13	5.01	5.75	5.98	0.52	1.56
4–Chloro–3–methylphenol	7.00	6.55	6.78	6.89	6.31	6.24	6.49	6.27	6.56	0.29	0.88
2–Methylnaphthalene	7.46	7.14	7.44	7.55	6.85	7.21	5.97	6.95	7.06	0.50	1.52
Hexachlorocyclopentadiene	2.60	2.36	2.69	3.02	2.14	2.47	2.27	2.73	2.53	0.28	0.84
2,4,6–Trichlorophenol	6.86	6.21	6.90	7.03	6.16	6.20	6.33	6.01	6.46	0.39	1.19
-Trichlorophenol	6.59	6.16	6.68	6.82	5.92	5.89	5.98	5.64	6.20	0.43	1.29
oronaphthalene	7.49	7.50	7.60	7.85	6.88	7.26	6.48	6.71	7.22	0.47	1.43
oaniline	6.19	5.62	5.93	6.01	5.34	5.17	4.71	5.38	5.54	0.49	1.46
Dimethyl phthalate	6.26	5.97	6.31	6.30	5.09	5.28	4.85	5.54	5.69	0.58	1.76
Acenaphthylene	7.95	7.85	8.25	8.03	7.36	7.52	6.63	7.11	7.58	0.53	1.61
3–Nitroaniline	5.71	5.01	5.31	5.33	4.60	5.01	4.38	4.91	5.03	0.42	1.27
Acenaphthene	7.88	7.99	8.33	8.37	7.16	7.44	6.79	6.84	7.59	0.63	1.90
Dibenzofuran	7.82	7.39	7.75	8.41	6.72	7.38	6.32	6.71	7.31	0.69	2.07
2,4–Dinitrotoluene	6.56	5.94	6.01	6.73	5.26	5.60	5.28	5.62	5.87	0.54	1.64
2,6–Dinitrotoluene	6.74	6.60	6.79	6.85	6.14	6.37	5.79	6.10	6.42	0.38	1.15
Diethyl phthalate	8.10	7.76	7.76	7.87	6.57	7.02	6.46	7.09	7.32	0.62	1.87
4–Chlorophenyl phenyl ether	8.13	7.73	7.83	8.00	6.61	7.09	6.43	6.83	7.33	0.67	2.01
Fluorene	8.21	8.27	8.67	8.34	7.20	7.50	6.94	7.36	7.81	0.63	1.90
4–Nitroaniline	5.63	4.94	5.25	5.28	4.67	4.24	4.18	4.23	4.80	0.55	1.67
4,6–Dinitro–2–methylphenol	2.76	2.23	3.32	4.28	2.90	2.93	2.45	2.95	2.97	0.62	1.86
N–Nitrosodiphenylamine	8.57	8.26	8.35	8.68	7.45	7.77	7.27	8.32	8.08	0.52	1.56
4–Bromophenyl phenyl ether	7.36	7.09	7.17	7.28	6.30	6.69	5.89	6.73	6.81	0.51	1.55
Hexachlorobenzene	8.13	7.78	7.93	7.77	6.76	7.20	6.48	7.70	7.46	0.59	1.77
Pentachlorophenol	3.26	2.57	3.13	4.98	2.90	3.06	2.25	2.09	3.03	0.89	2.67
Phenanthrene	8.92	8.84	8.78	9.26	7.57	8.49	7.49	8.89	8.53	0.65	1.95
Anthracene	8.16	8.12	8.47	8.37	7.16	7.48	6.68	8.00	7.80	0.63	1.90
Di–n–butylphthalate	8.77	8.68	8.71	8.67	7.55	7.77	7.03	8.78	8.24	0.68	2.06
Fluoranthene	8.14	7.94	7.99	8.26	6.92	7.28	6.57	7.76	7.60	0.61	1.84
Pyrene	8.85	8.49	9.06	8.86	7.83	8.13	7.65	8.61	8.43	0.51	1.54
Butyl benzyl phthalate	9.24	8.82	9.24	9.10	7.88	7.94	7.87	9.14	8.65	0.64	1.91
3,3'–Dichlorobenzidine	6.73	5.82	5.52	5.70	4.75	5.35	4.29	5.35	5.43	0.72	2.17
Benzo(a)anthracene	8.07	7.71	7.87	8.00	6.91	7.35	7.04	7.98	7.61	0.45	1.36
Bis(2–ethylhexyl)phthalate	9.32	9.04	9.65	11.01	8.45	8.36	8.33	10.05	9.27	0.94	2.82
Chrysene	8.21	7.37	8.32	7.93	7.13	7.56	7.13	8.06	7.71	0.47	1.43
n–octylphthalate	7.50	7.44	7.78	10.37	6.70	6.86	7.00	8.93	7.82	1.24	3.73
o(b)fluoranthene	6.46	6.17	6.17	6.57	5.38	6.19	5.69	6.26	6.11	0.39	1.17
o(k)fluoranthene	8.26	8.38	8.64	8.93	7.37	7.75	6.70	8.89	8.11	0.78	2.35
zo(a)pyrene	7.17	6.76	6.64	6.88	5.93	6.47	5.86	6.90	6.57	0.46	1.40
Indeno(1,2,3–cd)pyrene	5.79	5.65	5.65	5.81	4.81	5.24	4.85	5.93	5.46	0.44	1.32
Dibenzo(a,h)anthracene	7.41	6.96	7.14	7.20	6.19	6.71	5.96	7.29	6.85	0.53	1.59
Benzo(g,h,i)perylene	6.59	6.27	6.41	6.53	5.51	6.14	5.52	6.61	6.19	0.45	1.35

D: MS4
MDL STUDY
BNA–COMPOUNDS at 5ppb

DATE: 9–24–1991

COMPOUND	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	AVG	STD	MDL
Phenol	5.16	5.11	5.15	4.98	4.31	4.93	4.14	4.57	4.79	0.40	1.21
Bis(2–chloroethyl)ether	6.97	6.42	7.32	7.07	5.96	6.49	5.86	6.57	6.58	0.52	1.55
2–Chlorophenol	6.97	6.64	7.11	7.46	6.01	6.55	6.53	6.56	6.73	0.44	1.32
1,3–Dichlorobenzene	6.05	5.96	6.91	6.55	5.42	5.85	5.26	5.95	5.99	0.54	1.62
1,4–Dichlorobenzene	6.21	6.08	6.81	6.67	5.59	6.18	5.18	6.17	6.11	0.53	1.59
Benzyl alcohol	6.41	6.27	6.25	6.33	5.64	5.85	5.59	5.61	5.99	0.35	1.06
1,2–Dichlorobenzene	6.78	6.55	7.29	7.46	6.25	6.74	5.75	6.76	6.70	0.54	1.63
2–Methylphenol	6.21	5.88	6.42	6.61	5.19	5.90	5.32	5.78	5.91	0.50	1.49
Bis(2–chloroisopropyl)ether	6.71	6.42	7.01	6.97	5.68	6.19	5.52	6.13	6.33	0.56	1.67
4–Methylphenol	6.56	5.87	6.26	6.56	5.48	5.93	5.79	5.55	6.00	0.42	1.26
N–Nitrosodi–n–propylamine	7.29	6.93	7.34	7.39	6.33	6.87	6.26	7.00	6.93	0.44	1.31
Hexachloroethane	5.93	5.73	6.98	6.60	5.40	6.18	5.09	6.13	6.01	0.61	1.84
Nitrobenzene	7.79	7.35	8.43	8.26	7.12	7.83	7.12	7.14	7.63	0.53	1.58
Isophorone	7.98	7.70	8.35	8.32	7.27	8.09	7.21	8.04	7.87	0.44	1.31
2–Nitrophenol	6.19	6.09	6.47	6.76	5.56	5.98	6.03	5.98	6.13	0.36	1.08
2,4–Dimethylphenol	4.10	3.88	2.96	3.70	3.32	3.46	3.19	2.56	3.40	0.50	1.51
Bis(2–chloroethoxy)methane	7.44	6.92	7.30	7.57	6.54	7.05	6.50	6.89	7.04	0.37	1.12
2,4–Dichlorophenol	6.46	6.24	6.76	7.30	5.89	6.84	6.34	6.40	6.53	0.43	1.29
1,2,4–Trichlorobenzene	6.75	6.44	7.35	6.88	6.13	6.83	5.91	6.57	6.62	0.45	1.36
Naphthalene	7.38	6.85	7.33	7.32	6.53	7.16	6.17	6.86	6.95	0.43	1.30
4–Chloroaniline	7.09	6.13	6.09	6.56	5.52	6.98	5.08	5.67	6.14	0.71	2.12
Hexachlorobutadiene	6.49	5.96	7.09	6.80	5.93	6.81	5.16	6.64	6.36	0.63	1.90
4–Chloro–3–methylphenol	7.39	6.79	7.11	7.41	6.09	6.78	6.50	6.86	6.87	0.44	1.33
2–Methylnaphthalene	6.75	6.66	7.12	6.98	6.12	6.91	5.74	6.57	6.60	0.46	1.39
Hexachlorocyclopentadiene	1.45	1.33	1.34	1.73	1.03	1.50	1.23	1.59	1.40	0.22	0.65
2,4,6–Trichlorophenol	6.45	6.29	6.45	6.94	5.53	6.09	6.66	5.99	6.30	0.43	1.30
2,4,5–Trichlorophenol	6.29	6.59	6.79	6.71	5.47	6.32	6.41	6.40	6.37	0.41	1.22
2–Chloronaphthalene	6.69	7.18	7.07	7.04	6.00	6.59	5.83	6.48	6.61	0.50	1.49
2–Nitroaniline	5.71	6.07	6.02	5.88	4.89	5.64	5.31	5.61	5.64	0.39	1.17
Dimethyl phthalate	6.08	5.99	6.21	6.24	4.80	5.16	4.84	5.74	5.63	0.61	1.82
Acenaphthylene	7.40	7.47	7.81	7.33	6.44	7.40	6.15	7.19	7.15	0.56	1.68
3–Nitroaniline	6.00	5.81	5.53	6.15	4.69	5.29	4.65	5.22	5.42	0.56	1.69
Acenaphthene	6.91	7.12	6.84	7.18	6.13	6.52	6.21	6.89	6.73	0.40	1.19
Dibenzofuran	6.87	6.74	6.89	7.19	5.75	6.65	5.82	6.46	6.54	0.52	1.55
2,4–Dinitrotoluene	6.26	6.71	6.39	6.52	5.04	5.97	5.50	6.06	6.06	0.55	1.66
2,6–Dinitrotoluene	6.94	6.80	6.75	6.71	5.58	6.22	5.89	6.47	6.42	0.48	1.45
Diethyl phthalate	7.21	6.98	7.45	7.05	5.85	6.51	5.91	6.72	6.71	0.59	1.76
4–Chlorophenyl phenyl ether	7.02	6.90	7.57	7.50	5.82	6.71	6.15	6.64	6.79	0.61	1.81
Fluorene	7.12	7.23	7.46	7.21	6.22	6.74	6.31	6.86	6.89	0.45	1.35
4–Nitroaniline	5.42	5.52	5.72	5.45	4.32	5.11	4.49	5.54	5.20	0.52	1.56
4,6–Dinitro–2–methylphenol	1.64	1.67	2.17	3.37	1.56	2.00	1.36	1.62	1.92	0.64	1.90
N–Nitrosodiphenylamine	7.84	7.13	7.37	7.13	6.39	6.93	6.52	7.40	7.09	0.48	1.43
4–Bromophenyl phenyl ether	7.90	7.37	7.41	7.83	6.71	7.18	6.56	7.49	7.31	0.48	1.44
Hexachlorobenzene	7.89	7.74	7.57	7.68	6.79	7.06	6.60	7.82	7.37	0.48	1.44
Pentachlorophenol	2.70	2.51	2.76	4.30	2.59	2.95	2.11	1.73	2.71	0.75	2.25
Phenanthrene	7.77	7.49	7.52	7.78	6.99	7.30	6.70	7.54	7.38	0.37	1.12
Anthracene	7.34	7.05	6.91	7.21	6.31	6.65	6.30	7.02	6.85	0.39	1.18
Di–n–butylphthalate	7.82	7.74	7.21	8.17	6.62	6.98	6.73	7.65	7.34	0.54	1.63
Fluoranthene	7.43	7.32	7.10	7.89	6.32	6.70	6.50	7.92	7.15	0.61	1.82
Pyrene	7.88	8.00	7.77	8.33	6.89	7.93	7.13	8.21	7.77	0.50	1.51
Butyl benzyl phthalate	7.99	8.15	8.59	8.59	6.76	7.96	7.25	8.19	7.93	0.64	1.91
3,3'–Dichlorobenzidine	7.01	6.82	6.26	6.73	5.34	6.65	5.52	6.76	6.39	0.63	1.88
Benzo(a)anthracene	7.72	7.91	7.76	7.54	6.70	7.74	6.66	7.72	7.47	0.50	1.49
Bis(2–ethylhexyl)phthalate	7.94	8.34	8.62	9.21	6.92	7.76	7.45	9.08	8.17	0.80	2.39
Chrysene	7.06	7.55	7.13	7.30	6.34	7.15	6.49	7.42	7.06	0.43	1.29
Di–n–octylphthalate	7.34	7.02	7.42	9.71	6.44	6.26	7.35	8.77	7.54	1.16	3.49
Benzo(b)fluoranthene	6.50	6.56	6.49	6.14	5.50	5.47	5.55	6.34	6.07	0.49	1.45
Benzo(k)fluoranthene	8.42	8.20	8.54	9.16	7.67	7.09	7.78	9.12	8.26	0.72	2.17
Benzo(a)pyrene	6.91	6.17	6.33	6.39	5.53	6.00	5.73	6.62	6.21	0.45	1.36
Indeno(1,2,3–cd)pyrene	6.27	6.32	1.48	6.18	4.89	5.67	5.35	6.38	5.32	1.64	4.91
Dibenzo(a,h)anthracene	7.82	7.56	7.43	7.92	6.16	6.84	6.59	7.48	7.22	0.63	1.88
Benzo(g,h,i)perylene	6.63	6.92	6.86	6.83	5.41	5.73	5.66	6.57	6.33	0.62	1.86

ID: MS9
MDL STUDY
BNA– COMPOUNDS AT 5 PPB

DATE: 10–18–1991

COMPOUND	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	MDL9	MDL10	AVG	STD	MDL
Phenol	4.96	5.05	5.29	4.95	4.37	4.78	4.38	4.55	4.85	5.05	4.82	0.30	0.86
Bis(2–chloroethyl)ether	7.62	6.97	7.72	7.44	6.46	6.88	6.43	6.87	7.54	7.41	7.13	0.47	1.34
2–Chlorophenol	7.66	7.10	7.70	7.91	6.38	6.74	7.23	7.02	7.32	7.34	7.23	0.46	1.29
1,3–Dichlorobenzene	6.39	6.35	7.10	7.29	5.66	6.36	5.45	6.26	6.75	6.79	6.44	0.57	1.63
1,4–Dichlorobenzene	6.79	6.49	7.29	7.42	5.84	6.39	5.89	6.55	6.65	6.66	6.59	0.50	1.43
Benzyl alcohol	4.37	4.99	5.50	4.96	4.54	5.76	4.84	5.46	5.81	5.07	5.12	0.49	1.38
1,2–Dichlorobenzene	6.82	7.03	7.72	7.87	6.44	6.86	6.15	6.76	6.89	7.15	6.96	0.52	1.47
2–Methylphenol	7.37	6.66	7.10	7.43	5.83	6.50	6.62	6.74	7.22	6.71	6.81	0.48	1.35
Bis(2–chloroisopropyl)ether	7.34	7.03	7.80	7.91	6.55	7.17	6.66	7.34	7.78	7.95	7.35	0.50	1.42
4–Methylphenol	6.51	5.50	6.56	5.97	4.43	6.25	6.46	6.25	6.77	5.75	6.04	0.68	1.94
N–Nitrosodi–n–propylamine	7.57	7.59	7.68	7.96	6.57	7.30	6.73	7.09	7.99	7.74	7.42	0.48	1.37
Hexachloroethane	6.11	6.05	7.09	7.09	5.52	6.19	5.33	6.15	6.69	6.49	6.26	0.58	1.65
Nitrobenzene	7.45	7.72	7.70	7.69	6.61	7.41	6.56	7.35	8.11	8.04	7.46	0.52	1.47
Isophorone	8.45	8.57	8.38	8.67	7.61	8.40	7.43	8.15	8.59	9.32	8.35	0.53	1.51
2–Nitrophenol	5.72	5.52	6.24	6.10	5.25	6.47	5.85	6.27	4.98	6.43	5.88	0.50	1.43
2,4–Dimethylphenol	3.29	3.47	2.47	3.02	2.47	2.85	2.88	2.17	3.58	2.46	2.86	0.47	1.34
Bis(2–chloroethoxy)methane	7.43	7.20	7.17	7.25	6.41	7.34	6.45	7.23	7.17	7.85	7.15	0.42	1.21
2,4–Dichlorophenol	5.90	6.12	6.75	5.97	4.84	5.69	5.58	6.01	6.31	4.61	5.77	0.64	1.82
1,2,4–Trichlorobenzene	6.84	6.42	6.86	6.91	5.72	6.67	5.43	6.41	6.64	6.83	6.47	0.50	1.43
Naphthalene	7.54	7.06	7.58	7.52	6.84	7.51	6.29	7.20	7.54	7.75	7.28	0.44	1.25
4–Chloroaniline	7.20	6.46	5.68	6.46	5.31	7.38	5.30	6.43	7.17	5.82	6.31	0.77	2.18
Hexachlorobutadiene	6.42	6.02	7.17	6.92	5.59	6.40	5.15	5.99	6.54	6.77	6.29	0.61	1.74
4–Chloro–3–methylphenol	6.44	6.67	6.85	6.93	5.90	6.33	6.69	6.88	6.78	6.91	6.63	0.32	0.92
2–Methylnaphthalene	7.38	7.23	7.47	7.18	6.49	7.31	5.88	7.00	7.36	7.36	7.06	0.50	1.41
Hexachlorocyclopentadiene	0.57	0.53	0.48	0.51	0.14	0.65	0.62	0.94	0.70	0.80	0.59	0.21	0.59
2,4,6–Trichlorophenol	6.53	6.04	6.74	6.81	5.63	6.34	6.27	6.48	6.43	6.70	6.39	0.35	1.00
2,4,5–Trichlorophenol	4.65	5.71	5.78	5.14	4.58	4.71	5.20	4.84	5.62	4.90	5.11	0.45	1.27
2–Chloronaphthalene	7.65	7.59	7.77	7.57	6.66	7.33	6.37	7.32	7.78	8.01	7.40	0.51	1.45
2–Nitroaniline	5.70	6.03	5.84	6.13	4.63	6.09	5.17	6.33	6.66	6.45	5.90	0.61	1.72
Dimethyl phthalate	7.08	6.90	7.24	6.92	5.63	6.29	5.69	7.02	7.74	7.28	6.77	0.69	1.94
Acenaphthylene	8.40	8.43	8.76	8.63	7.55	8.43	7.43	8.43	8.89	9.03	8.39	0.52	1.48
3–Nitroaniline	5.05	4.60	4.91	5.50	4.13	4.75	4.15	5.63	5.92	5.12	4.97	0.59	1.68
Acenaphthene	8.10	8.21	8.35	8.09	7.15	7.89	7.03	7.93	8.35	8.65	7.97	0.51	1.45
Dibenzofuran	7.46	7.23	7.33	7.37	6.24	6.96	6.32	7.10	7.57	7.58	7.11	0.48	1.36
2,4–Dinitrotoluene	6.01	5.86	6.12	5.75	4.55	5.89	5.24	6.31	6.27	5.68	5.76	0.52	1.49
2,6–Dinitrotoluene	6.83	6.69	6.83	6.44	5.68	6.23	5.58	6.68	6.58	6.72	6.42	0.45	1.28
Diethyl phthalate	7.87	7.85	7.89	8.07	6.68	7.33	6.73	7.92	8.68	8.26	7.72	0.63	1.79
4–Chlorophenyl phenyl ether	8.28	8.15	8.25	8.20	6.98	7.85	6.81	7.93	8.15	8.44	7.90	0.55	1.57
Fluorene	8.13	7.84	7.96	8.06	6.88	7.67	6.94	7.88	8.22	8.10	7.76	0.48	1.35
4–Nitroaniline	3.54	3.26	3.09	3.54	2.17	2.72	4.11	5.72	5.26	4.69	3.81	1.12	3.16
N–Nitrosodiphenylamine	8.65	8.25	8.17	8.13	6.85	7.98	7.39	8.05	8.67	8.14	8.02	0.54	1.54
4–Bromophenyl phenyl ether	8.08	7.88	8.09	8.28	6.62	7.60	6.82	8.00	8.39	8.30	7.80	0.61	1.74
Hexachlorobenzene	8.99	8.43	8.95	9.41	7.62	8.55	7.46	8.86	9.05	9.10	8.64	0.63	1.80
Pentachlorophenol	0.51	0.39	0.75	1.08	0.11	1.09	0.46	0.50	0.48	0.40	0.57	0.31	0.87
Phenanthrene	8.72	8.84	8.62	8.80	7.46	8.36	7.56	8.59	8.83	9.15	8.49	0.55	1.56
Anthracene	8.27	8.36	8.36	8.28	7.10	8.04	7.35	8.50	8.80	8.74	8.18	0.55	1.56
Di–n–butylphthalate	8.71	8.75	8.79	9.11	7.75	8.42	7.97	9.49	9.29	9.65	8.79	0.62	1.75
Fluoranthene	8.42	8.59	8.42	8.57	7.28	8.22	7.41	8.76	8.70	8.69	8.30	0.53	1.50
Pyrene	8.38	8.32	8.08	8.30	7.51	7.82	7.24	8.38	8.48	8.35	8.08	0.42	1.19
Butyl benzyl phthalate	7.92	8.08	7.96	8.22	7.27	7.35	7.47	8.51	8.60	8.78	8.01	0.52	1.49
3,3'–Dichlorobenzidine	7.83	7.48	6.67	7.35	6.16	7.15	6.28	7.50	8.04	7.49	7.19	0.63	1.77
Benzo(a)anthracene	7.73	7.60	7.74	7.64	6.67	7.30	6.92	7.88	7.99	8.03	7.55	0.45	1.27
Bis(2–ethylhexyl)phthalate	8.65	8.97	9.32	10.32	8.28	8.12	8.56	9.98	9.77	10.60	9.25	0.87	2.47
Chrysene	8.06	8.16	8.19	7.90	6.97	7.70	6.93	8.11	8.16	8.49	7.86	0.52	1.47
Di–n–octylphthalate	7.86	7.88	8.17	10.74	7.22	7.08	7.46	9.35	8.49	8.99	8.32	1.12	3.16
Benzo(b)fluoranthene	6.07	6.23	6.39	5.97	5.24	5.91	5.22	6.18	6.12	6.21	5.95	0.40	1.14
Benzo(k)fluoranthene	9.68	8.85	9.09	9.95	8.28	8.13	8.40	9.44	9.94	10.31	9.20	0.77	2.18
Benzo(a)pyrene	6.85	6.38	7.14	7.18	5.73	6.85	6.00	6.72	7.10	7.62	6.75	0.57	1.62
Indeno(1,2,3–cd)pyrene	6.68	6.71	6.70	6.84	5.72	6.95	6.19	7.27	7.04	7.27	6.73	0.47	1.35
Dibenzo(a,h)anthracene	7.30	7.40	6.91	7.30	6.23	7.55	6.87	7.92	7.65	7.86	7.29	0.51	1.44
Benzo(g,h,i)perylene	6.59	6.96	6.83	6.65	5.92	6.91	6.36	7.30	7.05	7.15	6.77	0.40	1.15

PERFORMANCE EVALUATION REPORT DATE: 6/24/

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: NJ141 12129 Accutest Lab

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
TRACE METALS IN MICROGRAMS PER LITER:						
ALUMINUM	1	897	870	720- 999	755- 964	ACCEPTABL
	2	3290	3200	2730- 3630	2840- 3510	ACCEPTABL
ARSENIC	1	74.0	69.9	55.5- 82.8	58.9- 79.4	ACCEPTABL
	2	208	200	158- 234	168- 225	ACCEPTABL
BERYLLIUM	1	11.5	11.1	7.73- 14.7	8.63- 13.8	ACCEPTABL
	2	133	130	104- 159	111- 152	ACCEPTABL
CADMIUM	1	6.00	5.07	3.42- 6.82	3.85- 6.40	ACCEPTABL
	2	193	190	161- 218	168- 211	ACCEPTABL
COBALT	1	820	815	706- 915	733- 888	ACCEPTABL
	2	183	180	154- 205	161- 198	ACCEPTABL
CHROMIUM	1	73.0	74.0	56.7- 90.2	60.8- 86.0	ACCEPTABL
	2	405	410	334- 477	352- 459	ACCEPTABL
COPPER	1	43.0	43.0	34.9- 50.2	36.8- 48.3	ACCEPTABL
	2	729	730	656- 817	676- 797	ACCEPTABL
IRON	1	342	340	293- 391	305- 379	ACCEPTABL
	2	1020	1000	887- 1140	918- 1110	ACCEPTABL
MERCURY	1	0.510	0.543	0.246-0.903	0.329-0.820	ACCEPTABL
	2	3.16	3.40	2.54- 4.41	2.78- 4.18	ACCEPTABL
MANGANESE	1	425	420	385- 460	394- 451	ACCEPTABL
	2	930	920	850- 1010	869- 986	ACCEPTABL
NICKEL	1	1620	1600	1420- 1770	1460- 1720	ACCEPTABL
	2	439	430	383- 485	396- 472	ACCEPTABL
LEAD	1	316	320	271- 369	283- 357	ACCEPTABL
	2	49.7	47.9	38.3- 58.3	40.8- 55.8	ACCEPTABL

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/24/

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: NJ141

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
TRACE METALS IN MICROGRAMS PER LITER:						
SELENIUM	1	9.41	10.0	5.92- 13.1	6.82- 12.2	ACCEPTABL
	2	81.6	86.0	60.7- 105	66.1- 99.1	ACCEPTABL
VANADIUM	1	2000	2000	1760- 2240	1820- 2180	ACCEPTABL
	2	4620	4600	4130- 5160	4260- 5020	ACCEPTABL
ZINC	1	1900	1900	1670- 2110	1720- 2060	ACCEPTABL
	2	114	110	88.5- 133	94.1- 128	ACCEPTABL
ANTIMONY	3	16.4	17.1	8.31- 26.0	10.5- 23.8	ACCEPTABL
	4	92.0	97.0	55.9- 128	64.9- 118	ACCEPTABL
SILVER	3	0.900	0.806	0.460- 1.16	0.550- 1.07	ACCEPTABL
	4	7.30	6.80	5.14- 8.34	5.54- 7.94	ACCEPTABL
THALLIUM	3	6.99	6.75	4.11- 9.43	4.81- 8.73	ACCEPTABL
	4	89.8	97.1	76.6- 118	81.9- 112	ACCEPTABL
MOLYBDENUM	3	29.3	27.3	17.0- 36.6	19.8- 33.9	ACCEP
	4	4.72	4.01	1.21- 6.99	2.03- 6.17	ACCEPTABL
STRONTIUM	3	3.00	2.99	2.07- 3.95	2.33- 3.70	ACCEPTABL
	4	66.0	68.0	52.8- 84.3	57.0- 80.1	ACCEPTABL
TITANIUM	3	205	190	160- 222	166- 214	ACCEPTABL
	4	38.9	39.9	30.8- 47.5	33.0- 45.2	ACCEPTABL
MINERALS IN MILLIGRAMS PER LITER: (EXCEPT AS NOTED)						
PH-UNITS	3	8.90	8.80	8.46- 9.24	8.55- 9.14	ACCEPTABL
	4	5.52	5.52	5.42- 5.66	5.45- 5.64	ACCEPTABL
SPEC. COND. (UMHOS/CM AT 25 C)	1	117	119	104- 128	107- 125	ACCEPTABL
	2	872	901	799- 986	822- 963	ACCEPTABL

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/24/9

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: NJ141

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
MINERALS IN MILLIGRAMS PER LITER: (EXCEPT AS NOTED)						
TDS AT 180 C	1	63.0	59.1	31.9- 90.0	39.2- 82.7	ACCEPTABL
	2	507	521	387- 671	422- 636	ACCEPTABL
TOTAL HARDNESS (AS CACO3)	1	17.8	18.5	14.7- 22.4	15.6- 21.5	ACCEPTABL
	2	255	253	233- 270	237- 266	ACCEPTABL
CALCIUM	1	2.05	1.30	0.909- 1.61	0.997- 1.52	NOT ACCEPTABL
	2	72.7	71.0	61.8- 80.3	64.1- 77.9	ACCEPTABL
MAGNESIUM	1	3.68	3.70	3.16- 4.25	3.29- 4.11	ACCEPTABL
	2	18.0	18.5	16.0- 21.0	16.6- 20.4	ACCEPTABL
SODIUM	1	9.57	9.44	8.29- 10.8	8.60- 10.5	ACCEPTABL
	2	56.6	55.8	49.3- 61.8	50.9- 60.3	ACCEPTABL
POTASSIUM	1	9.18	8.95	7.43- 10.3	7.80- 9.97	ACCEPTABL
	2	29.6	28.9	24.8- 33.2	25.9- 32.1	ACCEPTABL
TOTAL ALKALINITY (CACO3)	1	20.1	18.2	14.7- 23.0	15.7- 22.0	ACCEPTABL
	2	109	112	96.7- 116	99.1- 114	ACCEPTABL
CHLORIDE	1	12.6	13.4	10.6- 15.5	11.2- 14.9	ACCEPTABL
	2	190	181	164- 201	169- 196	ACCEPTABL
FLUORIDE	1	0.720	0.750	0.636-0.852	0.664-0.825	ACCEPTABL
	2	2.85	2.90	2.38- 3.27	2.50- 3.16	ACCEPTABL
SULFATE	1	13.3	11.0	8.35- 13.4	8.98- 12.8	CHECK FOR ERR
	2	39.9	35.5	28.0- 41.9	29.8- 40.1	ACCEPTABL
NUTRIENTS IN MILLIGRAMS PER LITER:						
AMMONIA-NITROGEN	1	17.1	18.0	14.4- 21.3	15.2- 20.4	ACCEPTABL
	2	3.80	4.20	3.30- 5.09	3.51- 4.88	ACCEPTABL

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/24/9

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: NJ141

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
NUTRIENTS IN MILLIGRAMS PER LITER:						
NITRATE-NITROGEN	1	8.08	8.00	6.47- 9.52	6.83- 9.15	ACCEPTABL
	2	10.2	10.0	8.09- 11.9	8.55- 11.4	ACCEPTABL
ORTHOPHOSPHATE	1	1.37	1.40	1.15- 1.63	1.20- 1.57	ACCEPTABL
	2	0.319	0.320	0.251-0.385	0.267-0.369	ACCEPTABL
KJELDAHL-NITROGEN	3	2.15	3.10	1.96- 4.21	2.23- 3.94	CHECK FOR ERR
	4	20.7	25.0	18.9- 29.9	20.3- 28.5	ACCEPTABL
TOTAL PHOSPHORUS	3	3.08	3.60	2.84- 4.28	3.02- 4.11	ACCEPTABL
	4	1.77	1.80	1.38- 2.13	1.47- 2.04	ACCEPTABL
DEMANDS IN MILLIGRAMS PER LITER:						
COD	1	51.5	46.6	32.5- 57.1	35.6- 54.0	ACCEPTABL
	2	67.9	65.4	49.3- 75.8	52.7- 72.5	ACCEPTABL
TOC	1	18.9	18.4	15.5- 21.7	16.3- 20.9	ACCEP
	2	26.4	25.9	21.9- 29.8	22.9- 28.8	ACCEP
5-DAY BOD	1	28.0	30.0	15.8- 44.2	19.3- 40.6	ACCEPTABL
	2	39.0	41.4	22.7- 60.2	27.4- 55.5	ACCEPTABL
PCB'S IN MICROGRAMS PER LITER:						
PCB-ARCCLOR 1232	1	4.15	3.77	1.93- 5.06	2.33- 4.66	ACCEPTABL
PCB-ARCCLOR 1254	2	6.22	8.37	3.86- 11.0	4.76- 10.1	ACCEPTABL

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/24/

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: NJ141

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
PCB'S IN OIL IN MILLIGRAMS PER KILOGRAM:						
PCB IN OIL- 1016/1242	1	24.9	32.4	5.93- 45.6	11.0- 40.5	ACCEPTABL
PCB IN OIL- 1260	2	18.2	18.6	2.82- 29.5	6.25- 26.0	ACCEPTABL
PESTICIDES IN MICROGRAMS PER LITER:						
CHLORDANE	3	1.24	1.13	0.543- 1.49	0.661- 1.37	ACCEPTABL
	4	9.57	8.88	4.60- 11.5	5.48- 10.6	ACCEPTABL
ALDRIN	1	0.174	0.227	.0496-0.315	.0828-0.282	ACCEPTABL
	2	0.532	0.606	0.134-0.891	0.229-0.797	ACCEPTABL
DIELDRIN	1	0.179	0.208	0.104-0.300	0.129-0.275	ACCEPTABL
	2	0.442	0.467	0.269-0.650	0.317-0.603	ACCEPTABL
DDD	1	0.145	0.157	.0504-0.272	.0787-0.244	ACCEPTABL
	2	0.871	0.882	0.436- 1.13	0.523- 1.04	ACCEPTABL
DDE	1	0.146	0.183	.0715-0.274	.0974-0.249	ACCEPTABL
	2	0.376	0.417	0.170-0.626	0.227-0.569	ACCEPTABL
DDT	1	0.161	0.217	.0782-0.352	0.113-0.317	ACCEPTABL
	2	0.760	0.780	0.383- 1.13	0.476- 1.04	ACCEPTABL
HEPTACHLOR	1	0.099	0.119	.0284-0.174	.0466-0.155	ACCEPTABL
	2	0.536	0.587	0.214-0.796	0.287-0.723	ACCEPTABL
HEPTACHLOR EPOXIDE	1	0.094	0.108	.0568-0.148	.0682-0.137	ACCEPTABL
	2	0.324	0.350	0.192-0.490	0.229-0.453	ACCEPTABL

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/24/

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: NJ141

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
VOLATILE HALOCARBONS IN MICROGRAMS PER LITER:						
1,2 DICHLOROETHANE	1	17.7	17.2	10.5- 23.1	12.1- 21.5	ACCEPTAB
	2	46.3	38.9	26.8- 52.3	30.0- 49.1	ACCEPTAB
CHLOROFORM	1	14.0	13.3	8.35- 17.4	9.49- 16.3	ACCEPTAB
	2	75.4	64.4	41.1- 82.8	46.4- 77.6	ACCEPTAB
1,1,1 TRICHLOROETHANE	1	14.1	14.3	8.15- 18.5	9.44- 17.2	ACCEPTAB
	2	41.0	36.6	21.5- 48.6	24.9- 45.2	ACCEPTAB
TRICHLOROETHENE	1	14.2	13.9	8.68- 18.6	9.94- 17.3	ACCEPTAB
	2	45.6	38.9	25.9- 50.2	29.0- 47.1	ACCEPTAB
CARBONTETRACHLORIDE	1	11.3	11.7	6.46- 16.2	7.68- 15.0	ACCEPTAB
	2	51.0	46.6	28.6- 64.2	33.0- 59.7	ACCEPTAB
TETRACHLOROETHENE	1	16.1	15.1	9.27- 20.4	10.7- 19.0	ACCEPTAB
	2	73.1	63.9	40.5- 85.0	46.2- 79.3	ACCEPTAB
BROMODICHLOROMETHANE	1	16.2	16.1	10.5- 20.7	11.8- 19.4	ACCEI
	2	66.1	53.8	37.0- 70.5	41.3- 66.2	ACCEPTAB
DIBROMOCHLOROMETHANE	1	15.2	15.2	9.76- 20.6	11.1- 19.2	ACCEPTAB
	2	69.6	52.5	36.0- 69.7	40.3- 65.4	CHECK FOR ER
BROMOFORM	1	15.7	17.8	9.79- 25.1	11.7- 23.1	ACCEPTAB
	2	72.1	54.0	32.8- 76.2	38.3- 70.7	CHECK FOR ER
METHYLENE CHLORIDE	1	19.6	17.5	9.11- 25.1	11.1- 23.1	ACCEPTAB
	2	61.8	54.6	29.0- 77.3	35.1- 71.2	ACCEPTAB
CHLOROBENZENE	1	17.4	16.5	11.1- 21.6	12.4- 20.3	ACCEPTAB
	2	83.6	68.4	45.5- 90.2	51.2- 84.5	ACCEPTAB
VOLATILE AROMATICS IN MICROGRAMS PER LITER:						
BENZENE	1	14.4	11.3	7.72- 16.1	8.78- 15.0	ACCEPTAB
	2	51.7	46.5	31.3- 61.0	35.1- 57.2	ACCEPTAB

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.

PERFORMANCE EVALUATION REPORT DATE: 6/24/

WATER POLLUTION STUDY NUMBER WP026

LABORATORY: NJ141

ANALYTES	SAMPLE NUMBER	REPORT VALUE	TRUE VALUE*	ACCEPTANCE LIMITS	WARNING LIMITS	PERFORMANCE EVALUATION
VOLATILE AROMATICS IN MICROGRAMS PER LITER:						
ETHYLBENZENE	1	16.1	15.3	9.78- 20.0	11.1- 18.7	ACCEPTABL
	2	64.5	66.2	43.8- 86.2	49.2- 80.8	ACCEPTABL
TOLUENE	1	20.9	18.9	12.8- 24.6	14.3- 23.1	ACCEPTABL
	2	54.4	52.7	39.4- 65.9	42.7- 62.6	ACCEPTABL
1,2-DICHLOROBENZENE	1	15.8	15.5	10.9- 20.4	12.1- 19.2	ACCEPTABL
	2	59.5	71.8	49.4- 90.9	54.7- 85.6	ACCEPTABL
1,3-DICHLOROBENZENE	1	15.7	14.3	10.5- 18.3	11.5- 17.4	ACCEPTABL
	2	47.4	47.2	31.8- 60.3	35.4- 56.6	ACCEPTABL
1,4-DICHLOROBENZENE	1	18.4	17.2	11.4- 23.0	12.9- 21.5	ACCEPTABL
	2	54.8	55.4	38.1- 71.5	42.3- 67.2	ACCEPTABL
MISCELLANEOUS PARAMETERS:						
TOTAL CYANIDE (MG/L)	1	.0187	0.020	D.L.-.0352	.0020-.0304	ACCEPTABL
	2	0.628	0.530	0.365-0.676	0.404-0.637	ACCEPTABL
NON-FILTERABLE RESIDUE (IN MG/L)	1	59.2	63.3	46.1- 67.2	48.7- 64.5	ACCEPTABL
	2	21.6	23.9	14.8- 26.5	16.3- 25.0	ACCEPTABL
OIL AND GREASE (IN MG/L)	1	16.8	13.0	6.48- 17.7	7.88- 16.3	CHECK FOR ER
	2	19.3	17.0	9.07- 22.1	10.7- 20.5	ACCEPTABL
TOTAL PHENOLICS (IN MG/L)	1	0.425	0.455	0.195-0.714	0.261-0.648	ACCEPTABL
	2	.0126	.0146	.0025-.0266	.0056-.0236	ACCEPTABL
TOTAL RESIDUAL CHLORINE (IN MG/L)	1	1.80	2.00	1.27- 2.25	1.40- 2.12	ACCEPTABL
	2	0.10	0.110	D.L.-0.246	.0099-0.210	ACCEPTABL

* BASED UPON THEORETICAL CALCULATIONS, OR A REFERENCE VALUE WHEN NECESSARY.
D.L. STANDS FOR DETECTION LIMIT

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
CN 027, TRENTON, N.J. 08625-0027

Nancy Wittenberg
Director

(609) 292-5383
Fax # (609) 292-1074

March 25, 1991

Mr. Vincent Pugliese
Accutest Labs
2235 Rt. 130 South
Dayton, NJ 08810

Dear Mr. Pugliese:

Thank you for the cooperation shown to Fred Nicolai, Office of Quality Assurance, New Jersey Department of Environmental Protection (NJDEP), during the on-site evaluation of your laboratory facility on February 5, 1991.

No enforceable violations of N.J.A.C. 7:18-1.1 et. seq. were found during this laboratory audit.

The following are being listed as recommendations which the laboratory should be closely following in accordance with usage of the approved procedures for testing of water and wastewater.

1. For conductivity, the cell constant of the conductivity cell should be redetermined and permanently recorded. (Standard Methods 16th ed., pg. 79).

2. For turbidity analysis, samples with turbidity greater than 40 NTU should always be diluted with turbidity free water. (Standard Methods 16th ed., pg. 135).

3. To analyze for ammonia using nessler reagent, a 30 minute contact time should be allowed for low concentration samples. (Standard Methods 16th ed., pg. 379).

4. To analyze for nitrite, the nitrite stock solution should be standardized against standard permanganate and labeled properly. (Standard Methods 16th ed., pg. 405).

5. The conductivity meter should be calibrated daily or when used against a 0.01 M KCL solution and the data recorded. (Standard Methods 16th ed., pg. 76).

If this office can be of any further assistance, please call Fred Nicolai at (609) 633-3843.

Sincerely,

Jerry Bundy
Supervising Environmental Specialist
Office of Quality Assurance

c: Joseph F. Aiello, Manager, OQA
File

Form DWR-151
12/86

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION

LABORATORY PERSONNEL

LABORATORY CERTIFICATION NUMBER 12129

LABORATORY Accutest Labs

DATE OF EVALUATION 2/5/91

ADDRESS 2235 Rt 130 So
Dayton, NJ 08810

PHONE (201) 329-0200

NAME AND TITLE	EDUCATION DEGREE PhD, MS, BS, BA, Assoc., HS	EDUCATION MAJOR	NO. OF YEARS EXPERIENCE IN ENVIRONMENTAL TESTING	PRIMARY RESPONSIBILITY
Vincent Pugliese	BS	Env. Science	11	Vice President/Lab Director
William Sheedy	BS	Natural Res. Mgmt	9	Lab Manager
Brian T. Davis	BA	English Rutgers	7	QA & Systems Manager
Reza Tand	BS	Chem.	6	Organics Manager
Nancy Cde	MS	Chem.	4	Inorganics Manager
Doreen Heavens	BS	Env. Sci.	10	Org. Supervisor
Gosbir Sandhu			4	Metals Supervisor
Edith Imbimbo	BS	Chem	2	Wet Chem. Labs.
Shirley Biloholowski	BS	Natural Science	5	Extraction/Supervision
Ron Van Blarcom			8	Sample Manager
Wen Wen Chi	MS	Chem.	11	Technical Manager PEST/PCBs

sl ft² of lab space 20,000ft²

Total linear feet of lab bench 60ft

Inspected by [signature]

Manager's Signature [signature]

AR301539

Form DWR-152 A
12/86

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION

LABORATORY EQUIPMENT

TYPE OF EQUIPMENT	AVAILABLE YES	AVAILABLE NO	MANUFACTURER	MODEL	SERIAL #	COMMENTS
SERVICES:						CSER ☐
Light	✓		Recessed flu fix.			
Electrical	✓					
Gas	✓		natural gas			
Central Vacuum		✓	individual			
Secured Space	✓		(2) - Walk in Refrig			
Air Conditioning	✓		Several System			
LABORATORY WATER SUPPLY:						CLWT ☐
Distilled						
Double Distilled		✓				
Deionized	✓		Millipore - [illegible] - Carbon - 2 - Mixed Bed - [illegible]			
			TOC - [illegible]			
CHEMICAL STORAGE:						CSTO ☐
Volatile, Carcinogenic & Flammable	✓					
Acids	✓					
Housekeeping	✓					CHOK 01 ☐
EQUIPMENT:						CVGL ☐
Glassware (Class A volumetric)						
Pipets	✓		all class A			
Burets	✓		all class A			
Flasks	✓		all Class A			
Analytical Balance	✓		Mettler	AE100	C11680	8/16/90 - due 8/91
Pan Balance						
Top Loading Balance (6.2)	✓		Ohaus			
D.O. Meter	✓		YSI	54A		
pH Meter	✓		Orion			(F[illegible])
Buffer pH4 ☑ pH7 ☑ pH10 ☑	✓					
Specific Ion Meter	✓		Same as above			
Conductivity Meter	✓		YSI	35	cell constant [illegible]	
Amperometric Unit		✓				
Turbidimeter	✓		HF Instrument	DRT 100B		[illegible] Check [illegible] Good
Spectrophotometer (U.V.–VIS.)	✓		Spectronic	20D		[illegible] Break
Spectrophotometer (I.R.)	✓		PE	1420		[illegible] Hydro. (Backup)
Filter Photometer		✓				
Flame Photometer		✓				
Mercury Analyzer	✓		Spectro Products HG-4	8862		
Auto Analyzer	✓		Alpkem 300 series			(NO[illegible]) [illegible] CT 3 (TKN)
Class S Weights ✓ all req wts	✓		Hercules [illegible] Class "S" 14283			
NBS Thermometer	✓		(848-135) -1°C to 201°C with cert			
Total Organic Carbon Analyzer	✓		Dohrmann	DC-80		w/ [illegible] CWOC
IR Detector	✓					CTHM ☐
FID Detector		✓				
TOX Analyzer ?	✓		Dohrmann	(DX-20)		
BOD Incubator	✓		FISHER	307		Reads 20°C (daily log)
Gas Chromatograph		✓				
Microbio Incubator	✓					
44.5°C. Waterbath [illegible]	✓					
Autoclave	✓					

AR301540

Form DWR-152 B
5/85

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION

LABORATORY EQUIPMENT (continued)

TYPE OF EQUIPMENT	AVAILABLE YES	AVAILABLE NO	MANUFACTURER	MODEL	SERIAL #	COMMENTS
170°C. Oven 180°C (103-105°)	✓		Soleda			
Atomic Absorption						
Plasma Spectrometer						
~~DCP~~						
ICAP	✓		ICAP	PS-3000		Simultaneous
Gas Chromatograph	✓					
Refrigerator Holds 3°C	✓		Migali			4°C STD- Holding & [illegible]
~~Freezer~~ Walk in 4°C	✓					
Drying Oven Walk in [illegible]	✓		FISHER	655G		
Muffle Furnace	✓		NEY			
Hot Plates	✓		[illegible]			[illegible]
Magnetic Stirrer	✓		Fisher	120M		PC-320
Desiccators 12	✓		Dessicant Look good			
Steam Bath						
Stirred Boiling Water Bath with Gabled Lid for Nitrate by Brucine Method		✓				
Centrifuge						
Cyanide	✓					
LABORATORY APPARATUS:						
3 Fluoride Distillation	✓					
C[illegible] Reflux	✓					
K[illegible]ahl	✓					
Kjeldahl Digester	✓					
Cyanide Distillation	✓					
Soxhlet Extraction	✓					
2- Phenols	✓					
LABORATORY SAFETY:						
Emergency Exits	✓		2-4 Exits/lab area			
Fire Alarm	✓					
Smoke Detector	✓					
Sprinkler System	✓					
Fire Extinguishers	✓		CO_2 - ABC - Dry Chem + H_2O			
Fire Blanket	✓					
Emergency Lights	✓		30% Battery pack up			
First Aid Station 4	✓					
Emergency Phone Numbers						
Hazardous Materials Chart						
Eye Wash Stations	✓					
Chemical Burn Stations						
Safety Shower	✓					
Lab Coats	✓					
Safety Glasses	✓					
Face Shield	✓		Extraction area			
Respirator with Compressed Air Supply	✓					
Fume Hoods 10	✓					
[illegible]chloric Acid Hood		✓				
Co[illegible]pressed Gas Tanks Secured	✓					
Electrical Cables Secured	✓					
Is there an antidote for HF burns? e.g. A paste of MgOH and Glycerol and a saturated solution of $MgSO_4$		✓	not used			

Form DWR-153 A
6/85

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION
LIMITED CHEMISTRY GENERAL PROCEDURES

ACIDITY 11/15/90

	NA	YES	NO		COMMENTS
1. Are sample containers filled completely?	☐	☑	☐	CACD 01	
2. Are samples analyzed within 14 days of collection?	☐	☑	☐	CACD 02	
3. Is the NaOH titrant standardized against potassium biphthalate and labeled properly?	☐	☑	☐	CACD 03	
4. Are wastewater samples titrated to pH 8.3 using an electrometric endpoint?	☐	☑	☐	CACD 04	
5. If a phenophthalein indicator is used, is free residual chlorine removed with thiosulfate?	☑	☐	☐	CACD 05	

ALKALINITY 1/31/91

1. Are sample containers filled completely?	☐	☑	☐	CALK 01	
2. Are samples analyzed within 14 days of collection?	☐	☑	☐	CALK 02	
3. Is the H_2SO_4 or HCl standardized against Na_2CO_3 and labeled properly?	☐	☑	☐	CALK 03	
4. Are wastewater samples titrated to pH 4.5 using an electrometric endpoint?	☐	☑	☐	CALK 04	
5. If methyl orange indicator is used, is free residual chlorine removed with thiosulfate?	☑	☐	☐	CALK 05	

BIOCHEMICAL OXYGEN DEMAND 1/26 – 1/31/91

1. Are samples cooled to 4°C during transit and received in within 48 hrs. of collection?	☐	☑	☐	CBOD 01	
the sodium thiosulfate standardized against potassium biniodate or potassium dichromate and labeled properly?	☐	☑	☐	CBOD 02	
3. Is a seed used on chlorinated or industrial effluents?	☐	☑	☐	CBOD 03	polyseed
4. Is the depletion of unseeded dilution water blank less than 0.2 mg/l?	☐	☑	☐	CBOD 04	
5. Do the sample dilutions used to compute the BOD have depletions of at least 2 mg/l and a residual DO of 1 mg/l?	☐	☑	☐	CBOD 05	
6. Is a glucose-glutamic acid standard included with approximately every 20 analyses?	☐	☑	☐	CBOD 06	
7. Is the BOD incubator thermometer graduated in intervals of 1°C or smaller?	☐	☑	☐	CBOD 07	
8. Is chlorine removed with sodium sulfite?	☑	☐	☐	CBOD 08	
9. How many dilutions are prepared to determine BOD?					1☐ 2☑ 3☑ 4☐ 5☑ known Unknown

CHEMICAL OXYGEN DEMAND (Holding 28 Days) 1/31/91

1. Are samples preserved with H_2SO_4 to a pH to 2?	☐	☑	☐	CCOD 01	
2. Upon receipt in the laboratory, is the sample pH measured and recorded to verify that it is preserved?	☐	☑	☐	CCOD 02	
3. Is the Dichromate reflux method used?					
a. Is the ferrous ammonium sulfate titrant standardized daily against primary standard grade $K_2Cr_2O_7$?	☐	☑	☐	CCOD 03	
b. Is 0.025 N $K_2Cr_2O_7$ used for samples below 50 mg/l?	☐	☑	☐	CCOD 04	
c. Is a blank run with each set of samples?	☐	☑	☐	CCOD 05	
d. Is at least 0.5 ml of titrant used in the titration of the excess dichromate for the majority of samples?	☐	☑	☐	CCOD 06	
s $HgSO_4$ used to complex chloride?	☐	☑	☐	CCOD 07	
he automated colorimetric method used?	☑	☐	☐	CCOD 08	
5. Is the manual colorimetric method used?	☑	☐	☐		
a. Are digestion tubes heated in a block heater or oven at 150°C for 2 hrs.?	☑	☐	☐		
b. Is absorbance read @ 600 nm in a spectrophotometer?	☑	☐	☐		

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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION

LIMITED CHEMISTRY GENERAL PROCEDURES

	NA	YES	NO		COMMENTS
HARDNESS, TOTAL (Holding 6 mos.) 1/23/91					
1. Are samples preserved with acid (HNO_3 or H_2SO_4) to pH<2?	☐	☑	☐	CHRD 01	
2. Is the EDTA titrimetric method used?					
a. Is the EDTA titrant standardized against $CaCO_3$ and labeled properly?	☐	☑	☐	CHRD 02	
b. Is the EDTA titrant approximately 0.01M?	☐	☑	☐	CHRD 03	
3. Is the automated colorimetric (calmagite) method used?	☑	☐	☐		
4. Is the hardness calculated from Ca+Mg values determined by atomic absorption?	☑	☐	☐		
HYDROGEN ION (pH) (Analyze immediately)					
1. Is an electronic pH meter with temperature compensation used?	☐	☑	☐	CpH 01	
2. Are electrodes stored according to the manufacturer's recommendations?	☐	☑	☐	CpH 02	
3. Are the electrodes filled with sufficient quantity of electrolyte?	☐	☑	☐	CpH 03	
CONDUCTIVITY (Holding 28 Days)					
1. Are samples measured at 25°C or is a temperature correction made?	☐	☑	☐	CCON 01	
2. Has the cell constant of the conductance cell been termined and permanently recorded?	☐	☐	☐	CCON 02	
METHYLENE BLUE ACTIVE SUBSTANCES (Holding 48 Hrs.) 1/25/91					
1. Is MBAS being determined by the methylene blue method?	☐	☑	☐	CMBA 01	
2. Is LAS reference material available and used in the preparation of standards?	☐	☑	☐	CMBA 02	
3. Is the determination of absorbance done at 652 nm against a blank of chloroform?	☐	☑	☐	CMBA 03	
TURBIDITY (Holding 48 Hrs.) 1/24/91					
1. Is the nephelometric method used?					
a. Are samples with turbidity greater than 40 NTU diluted with turbidity-free water?	☐	☑	☐	CTUR 01	Be sure to dilute all samples > 40 NTU's with turbidity free water.
b. Are sample tubes clear, colorless glass which are clean and have no scratches?	☐	☑	☐	CTUR 02	
COLOR (Holding 48 Hrs.) 1/3d/91					
1. Is the visual comparison method used?					
a. Is interference due to turbidity removed by filtration or centrifugation?	☑	☐	☐	CCOL 01	Hyprocut Color done
b. Is the pH of the sample measured and reported with the result?	☐	☑	☐	CCOL 02	
c. Are platinum-cobalt standards used?	☐	☑	☐	CCOL 03	
d. Are color disc standards calibrated against platinum-cobalt standards every 6 months?	☑	☐	☐	CCOL 04	
the spectrophotometric method used?	☑	☐	☐		
3. s the ADMI method used?	☑	☐	☐		

Form DWR-153 C
5/85

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION

LIMITED CHEMISTRY GENERAL PROCEDURES

	NA	YES	NO		COMMENTS
RESIDUE, (T.D.S.), (TOTAL FILTERABLE RESIDUE) 1/30/91					
(Holding 48 Hrs.)					
1. Does the desiccator have suitable dessicant and indicator?	☐	☑	☐	CTDS 01	
2. Is an analytical balance capable of weighing to 0.1 mg available?	☐	☑	☐	CTDS 02	
3. Are glass fiber filter discs used?	☐	☑	☐	CTDS 03	934AH - Orbital 180°
4. Are samples for total dissolved solids dried at 180°C?	☐	☑	☐	CTDS 04	
5. a. Does the dissolved residue, when weighed, yield <200 mg?	☐	☑	☐	CTDS 05	
b. If not, is smaller aliquot used?	☐	☑	☐	CTDS 06	
RESIDUE, (TSS), (TOTAL NONFILTERABLE RESIDUE)					
(Holding 7 Days) 1/30/91					
1. Is the residue dried at 103-105°C?	☐	☑	☐	CTSS 01	
RESIDUE, TOTAL SOLIDS (Holding 7 Days) 1/16/91					
1. Is sample dried at 103-105°C until weight is constant?	☐	☑	☐		
CHLORIDE (No Pres., Holding 28 Days) 1/29/91					
1. Is the argentometric (silver nitrate) method used?					
a. Is the $AgNO_3$ titrant standardized against NaC1 dried at 140°C and labeled properly?	☑	☐	☐	CCLD 01	
b. Is interference due to sulfide, sulfite or thiosulfate removed with H_2O_2?	☑	☐	☐	CCLD 02	
...e mercuric nitrate method used?					
...s the pH adjusted to 2.5?	☑	☐	☐	CCLD 03	
b. Is a 1 or 5 ml microburet used for titration?	☑	☐	☐	CCLD 04	
c. Is the NaCL standard dried at 600°C for 1 hour?	☑	☐	☐	CCLD 05	
3. Is the automated ferricyanide method used?	☐	☑	☐		
4. Is the ion chromatographic method used for drinking water?	☑	☐	☐		
FLUORIDE (No Pres., Holding 28 Days) 1/29/91					
1. Are water samples distilled?	☐	☑	☐	CFLR 01	except for DW
2. Is the specific ion electrode method used?					
a. Are both samples and standards analyzed at room temperature?	☐	☑	☐	CFLR 02	
3. Is the SPADNS method used?					
a. Is the SPADNS solution stored in an amber bottle and protected from direct sunlight?	☑	☐	☐	CFLR 03	
b. Is sodium arsenite used to remove residual chlorine?	☑	☐	☐	CFLR 04	
4. Is the automated complexone method used?					
a. Is the working color reagent prepared fresh every 3 or 4 days?	☑	☐	☐	CFLR 05	
CHLORINE RESIDUAL (No Pres., No Holding) 1/7/91					
1. a. Is chlorine residual determined by iodometric titration, DPD colorimetric or DPD titrimetric methods?	☐	☑	☐	CCLR 01	
b. In the iodometric titration is the excess reducing agent back-titrated with iodine or iodate solutions?	☑	☐	☐	CCLR 02	
c. In the DPD colorimetric method are kits with color ...heels, and reagent packets used?	☑	☐	☐		
... the chlorine residual determined by specific ion ...electrode?	☑	☐	☐		
e. Is the starch end-point method used?	☑	☐	☐		

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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION
LIMITED CHEMISTRY GENERAL PROCEDURES

1/31/91

AMMONIA (Holding 28 Days)	NA	YES	NO		COMMENTS
1. Are samples preserved with H_2SO_4 to pH 2 at time of collection?	☐	☑	☐	CAMM 01	
2. Upon receipt in the laboratory, is the pH measured and recorded?	☐	☑	☐	CAMM 02	
3. Are samples analyzed within 28 days of collection?	☐	☑	☐	CAMM 03	
4. Is a manual distillation at pH 9.5 used?	☐	☑	☐	CAMM 04	
a. Do you use macro or micro distillation equipment?					
b. Are stills steamed with ammonia-free water prior to distillation of samples and the distillate checked for residual NH_3?	☐	☑	☐	CAMM 05	Method Blanks used
c. Is chlorine residual removed by thiosulfate or arsenite prior to distillation?	☑	☐	☐	CAMM 06	
5. Is Nesslerization method used following distillation (for 0.05 to 1.0 MGNH$_3$-N/L)?					
a. Is 2 ml of Nessler reagent added to raise the alkalinity to the desired level?	☐	☑	☐	CAMM 07	
b. Is the same contact time used for samples standards and blanks?	☐	☑	☐	CAMM 08	
c. Is a 30 min. contact time allowed for low concentration samples?	☐	☑	☐	CAMM 09	be sure to provide for 30 min Contact time for Low Conc. Std.
6. Is the selective ion method used (for 0.05 to 1.0 mgNH$_3$-N/L)?					
a. Is the pH of the sample maintained at greater than 11?	☑	☐	☐	CAMM 10	
b. Is NaOH added to samples prior to electrode immersion?	☑	☐	☐	CAMM 11	
c. Are low concentration standards run first?	☑	☐	☐	CAMM 12	
7. Is the automated phenate method used?					
a. If $HgCl_2$ is used as a preservative, is an equivalent amount added to NH_3 standards?	☑	☐	☐	CAMM 13	
b. If H_2SO_4 is used as a preservative, is H_2SO_4 added to wash water and standards?	☑	☐	☐	CAMM 14	
8. Is titration method used (for 0.05 to 1.0 MGNH$_3$-N/L)?	☑	☐	☐	CAMM 15	
a. Is H_2SO_4 0.02N?	☑	☐	☐	CAMM 16	
b. Is a blank carried through all the steps of the procedure?	☑	☐	☐	CAMM 17	

1/31/91

NITRATE					
1. Are drinking water samples analyzed within 24 hours of collection?	☑	☑	☐	CNAT 01	
2. Are wastewater samples analyzed within 48 hours of collection?	☐	☑	☐	CNAT 02	
3. If not, are samples preserved with H_2SO_4 to pH 2 at time of collection for NO_3/NO_2?	☐	☑	☐	CNAT 03	
4. Is the brucine method used?					
a. Are samples filtered if turbid?	☑	☐	☐	CNAT 04	
b. Is the temperature of the waterbath 95 - 100°C?	☑	☐	☐	CNAT 05	
c. Is the stock nitrate STD 100 mg/l, preserved with chloroform and kept no longer than 6 months?	☑	☐	☐	CNAT 06	
d. Is the brucine-sulfanilic acid reagent stored at 4°C in a dark bottle?	☑	☐	☐	CNAT 07	
e. Is residual chlorine removed by adding sodium arsenite solution (1 drop/0.1 mg/l)?	☑	☐	☐	CNAT 08	
5. Is the manual cadmium reduction method used?					
a. Is interference due to turbidity removed?	☑	☐	☐	CNAT 09	
b. Is a nitrate and nitrite standard passed through the column with each run to check recovery?	☑	☐	☐	CNAT 10	
c. Is the column reactivated when the value of F>0.33?	☐	☑	☐	CNAT 11	
6. Is the automated cadmium reduction method used?					
a. Is a nitrate and nitrite standard run with each batch of samples to check column efficiency?	☐	☑	☐	CNAT 12	
7. Is the automated hydrazine reduction method used?	☑	☐	☐	CNAT 13	
8. Is the ion chromatographic method used for drinking water?	☑	☐	☐		

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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION
LIMITED CHEMISTRY GENERAL PROCEDURES

	NA	YES	NO		COMMENTS
samples cooled to 4°C and anlyzed within 48 hrs. of collection if not preserved?	☐	☑	☐	CNIT 01	
2. Is the Diazotization method used?	☐	☑	☐		
a. Is the nitrite stock solution standardized against standard permanganate and labeled properly?	☐	☑	☐	CNIT 02	Need to Standardize
b. Are turbid samples filtered through a 0.45 micron filter?	☐	☑	☐	CNIT 03	NO3 Stds

KJELDAHL NITROGEN, TOTAL 1/18/91 Using Automated Phenate method.

1. Are samples preserved with H_2SO_4 to pH 2 and analyzed within 28 days of collection?	☐	☑	☐	CTKN 01	
2. Is the 0.020 N H_2SO_4 standardized against Na_2CO_3 and properly labeled?	☑	☐	☐	CTKN 02	
3. Is the distillate from the digestion collected below the surface of the boric acid?	☑	☐	☐	CTKN 03	

ORTHOPHOSPHATE (Pres. - Filter Immed.) 1/28/91

1. Are samples cooled to 4°C and analyzed within 48 hrs. of collection?	☐	☑	☐	CORP 01	Use method
2. Is the ascorbic acid method used?	☐	☑	☐	CORP 02	365.3
a. Is the ammonium molybdate solution stored in plastic at 4°C?	☐	☑	☐	CORP 03	(2-reagent)
b. Is the 0.1 M. ascorbic acid stored at 4°C and prepared fresh weekly?	☐	☑	☐	CORP 04	
c. Is the combined reagent prepared daily with all reagents at room temperature prior to mixing?	☐	☑	☐	CORP 05	

PHOSPHORUS, TOTAL (Pres. H_2SO_4 to pH<2) 1/21/91
(Holding 28 Days)

1. Is an acid-persulfate digestion used for wastewater samples?	☐	☑	☐	CTPH 01	
2. Is the ascorbic acid method used to determine total phosphorus after the digestion?	☐	☑	☐	CTPH 02	

ORGANIC CARBON, TOTAL (Holding 28 Days) 1/31/91

1. Are samples preserved with H_2SO_4 or HCl to pH 2 at time of collection?	☐	☑	☐	CTOC 01	
2. Upon receipt in the laboratory, is the pH measured and recorded?	☐	☑	☐	CTOC 02	
3. Is the ~~combustion-infrared method used?~~					
a. Is inorganic carbon removed by decomposition with ~~acid or~~ alternatively is a correction made for the inorganic fraction?	☑	☐	☐	CTOC 03	UV Cat persulfate Ox
~~b. Is a methane detection technique used in place of IR?~~	☑	☐	☐	CTOC 04	
4. Is analysis performed within 28 days?	☐	☑	☐	CTOC 05	
5. Is the instrument being calibrated daily with at least 3 standards?	☐	☑	☐	CTOC 06	Cal. - (5 Stds least conc
6. Have samples been checked with potassium acid phthalate for recovery?	☐	☑	☐	CTOC 07	
7. Is an external reference sample such as E.M.S.L.Q.C. analyzed at least yearly?	☐	☑	☐	CTOC 08	daily
8. Are standards prepared at least monthly?	☐	☑	☐	CTOC 09	Working Stds daily Stock - monthly

SULFATE (Pres. - Cool to 4°C - Holding 28 Days) 1/28/91

1. Is the gravimetric method used?					
Is silica removed by treatment with HC1 and filtering?	☐	☑	☐	CSFA 01	
s the barium sulfate precipitate washed with distilled water to remove chlorides?	☐	☑	☐	CSFA 02	
c. Is the residue ignited at 800°C?	☐	☑	☐	CSFA 03	
2. Is the turbidimetric method used?					
a. Are the samples stirred for exactly 1 minute after the addition of $BaCl_2$?	☑	☐	☐	CSFA 04	

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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY PROCEDURES

LIMITED CHEMISTRY GENERAL PROCEDURES

	NA	YES	NO		COMMENTS
SULFATE – Continued					
2. b. Are both samples and standards read at 5 ± 0.5 minutes after stirring?	☑	☐	☐	CSFA 05	
c. Are blanks used to correct for color or turbidity?	☑	☐	☐	CSFA 06	
3. Is the automated chloranilate method used?					
a. Are interferences due to Ca, Al, and Fe removed by an ion exchange column?	☑	☐	☐	CSFA 07	
4. Is the ion chromatography method used for drinking water?	☑	☐	☐		
SULFIDE (Pres. - 4°C, Zn Acetate + NaOH to pH>9 - Holding 7 Days) 1/30/91					
1. Is the Methylene Blue method used?					
a. Is the methylene blue solution standardized against a known solution and adjusted so that 1 drop = 1.0 mg/l sulfide?	☑	☐	☐	CSFD 01	
b. Is the titrimetric (Iodine) method used?	☐	☑	☐	CSFD 02	
SULFITE (No Preservation) 1/26/91					
1. Is the titrimetric iodine-iodate method used?					
2. Are samples analyzed on site?	☐	☑	☐	CSFT 01	
CYANIDE 1/30/91					
1. Are samples analyzed within 14 days of collection?	☐	☑	☐	CCYN 01	
2. Are samples preserved with NaOH to pH 12 + 0.6 G ascorbic acid?	☐	☑	☐	CCYN 02	
3. Upon receipt in the laboratory, is the pH measured and recorded?	☐	☑	☐	CCYN 03	
4. If chlorinated, do you remove sulfide as Cd sulfide?	☑	☐	☐	CCYN 04	
5. Is a manual distillation with $MgCl_2$ done?	☐	☐	☐		
6. Is the titrimetric method used?	☑	☐	☐	CCYN 05	
a. Is the $AgNO_3$ standardized against NaCl and labeled properly?	☑	☐	☐	CCYN 06	
b. Is a blank run with each set of samples?	☑	☐	☐	CCYN 07	
7. Is the colorimetric method used?					
a. Is Chloramine T prepared weekly and stored in refrigerator?	☐	☑	☐	CCYN 08	
b. Is the stock cyanide solution standardized weekly against $AgNO_3$?	☐	☑	☐	CCYN 09	
OIL AND GREASE (Holding 28 Days) 1/21/91					
1. Are samples collected in glass containers?	☐	☑	☐	CONG 01	
2. Are samples preserved with H_2SO_4 to pH<2?	☐	☑	☐	CONG 02	
3. Is a liquid-liquid extraction with freon used?	☐	☑	☐	CONG 03	
4. Is the oil and grease content determined gravimetrically?	☐	☑	☐	CONG 04	
PHENOLS (Holding 28 Days) 1/25/91					
1. Are samples collected in glass containers?	☐	☑	☐	CPHN 01	
2. Are samples preserved with H_2SO_4 to pH<2?	☐	☑	☐	CPHN 02	
3. Upon receipt in the laboratory, is the pH measured and recorded?	☐	☑	☐	CPHN 03	
4. Are samples analyzed within 28 days of collection?	☐	☑	☐	CPHN 04	
5. Is the colorimetric 4AAP method with distillation used?	☐	☑	☐	CPHN 05	
6. Is the colorimetric 4AAP method for halogenated phenols used or Is U.S.E.P.A. Method 604 used?	☑	☐	☐	CPHN 06	

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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

1-PE 1100
1-PE 5000
3-PE 5100 — output to QA's RS

ON-SITE LABORATORY EVALUATION

ATOMIC ABSORPTION AND METAL PROCEDURES

	NA	YES	NO		COMMENTS
Is the instrument have the following:					Zeeman + Dr.
1. Background Correction - Continuum Source	☐	☑	☐		Microprocessor/printer
2. Stripchart Recorder	☑	☑	☐	CAAR 02	5000 — Stripchart
3. Double Beam	☐	☐	☑		
4. Graphite Furnace	☐	☑	☑		
5. Auto Sampler	☐	☑	☐		
6. Are trace metals samples preserved with HNO_3 to pH of 2 at time of collection? (Holding: Hg - 28 days, others 6 mos.)	☐	☑	☐	CAAS 06	
7. Are samples for dissolved metals filtered through 0.45 u membrane filter and the filtrate preserved with HNO_3?	☐	☑	☐	CAAS 07	
8. Is an acid digestion done on total metals samples for drinking water?	☐	☑	☐	CAAS 08	
9. Upon receipt in laboratory is sample pH measured & recorded?	☐	☑	☐	CAAS 09	
10. Is deionized-distilled or double-distilled water used?	☐	☑	☐	CAAW 10	
11. Is glassware acid washed?	☐	☑	☐	CAAG 11	
12. Are all the required lamps available for parameters requested?	☐	☑	☐	CAAL 12	List attached
13. List lamps available and underline multi-element lamps.	☐	☐	☐		
14. Are all the following fuel mixtures available? Air-Acetylene Nitrous oxide-acetylene — available Argon-hydrogen ~~(Hydride Generation - $Zn+SnCl_2$)~~ *Circle if not available*	☐	☑	☐	CAAC 14	
15. In the graphite furnace method, is each sample matrix examined for interference effects by the method of standard additions?	☐	☑	☐	CAAM 15	
16. Are 10% check standards run for the graphite furnace method to monitor when the furnace should be changed?	☐	☑	☐	CAAM 16	
17. Cd, Cr, Pb and Zn are low level samples extracted into MIBK after chelation of the desired metal with APDC or is $CHCl_3$ used as a solvent for PDCA extraction?	☑	☐	☐	CAAM 17	
18. In the determination of low level chromium, is Cr III oxidized to Cr VI prior to extraction?	☑	☐	☐	CAAM 18	
19. Are Se and As converted to the gaseous hydride with $SNCl_2$ + Zn metal and determined in an argon-hydrogen flame?	☑	☐	☐	CAAM 19	
20. Is a nitrous oxide flame used for Al,Ba,Be,Mo,Ti,Os,Rh,Si,Th&V?	☑	☐	☐	CAAM 20	(ICAP) only
21. If Ba is determined using an air-acetylene flame, is La added to both samples and stds?	☑	☐	☐	CAAM 21	
22. For Al, Ba, Na and Ti analysis, is K added to both samples and standards to eliminate ionization of the measured species?	☑	☐	☐	CAAM 22	
23. For Ca and Mg analyses, is La added to both samples and standards to eliminate interference?	☑	☐	☐	CAAM 23	
24. ~~For Cr by graphite furnace~~ and Mn by direct aspiration analyses, is Ca added to both samples and standards to eliminate interference?	☑	☐	☐	CAAM 24	
25. Is apparatus available for the determination of Hg by the cold vapor technique of Hatch and Ott?	☐	☑	☐	CAAM 25	
26. Is a $KMnO_4$ trap, some type of scrubber or venting up the hood used in the apparatus for flameless Hg determination?	☐	☑	☐	CAAM 26	
27. If only dissolved mercury is to be determined, is the sample filtered through an all glass apparatus before the acid is added?	☑	☐	☐	CAAM 27	
28. [illegible]sulfate added when determining total Hg?	☐	☑	☐	CAAM 28	
29. [illegible]MnO_4 added until dark color persists?	☐	☑	☐	CAAM 29	
30. [illegible] the samples heated for 2 hours at 95°C in a water bath?	☐	☑	☐	CAAM 30	
31. Is mercury reduced with $SnCl_2$ or $SnSO_4$?	☐	☑	☐	CAAM 31	
32. For Mo and V analyses is Al added to both samples & standards?	☑	☐	☐	CAAM 32	(ICAP only)

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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION

ICAP AND DCP PROCEDURES

	NA	YES	NO	COMMENTS
1. Does the instrument have background correction?	☐	☑	☐	
2. If DCP, does the instrument have a 3 electrode system, not a 2 electrode system?	☑	☐	☐	
3. Does the instrument have computer control?	☐	☑	☐	
4. Is a peristaltic pump used with the system?	☐	☑	☐	
5. If DCP, are enhancers used?	☑	☐	☐	
6. Does the instrument have temperature control or is the environment temperature and humidity controlled?	☐	☑	☐	
7. Are the acids used trace metal grade?	☐	☑	☐	
8. Is an instrument check standard run 10% of time to check for impurities and spectral interferences?	☐	☑	☐	
9. Are 10x Instrument Detection Limit spikes run (1 every 20)?	☐	☑	☐	
10. sample digestion documented?	☐	☑	☐	
11. Is instrument monitored weekly for stability?	☐	☑	☐	
12. Is a profile check run every 4 hours if not documented or at least once a shift and documented?	☐	☑	☐	
13. If there is no peristaltic pump used are samples filtered?	☑	☐	☐	
14. Is a white light and a dark current check run at least every 3 months? (DCP)	☑	☐	☐	
15. Is the correlation coefficient > 0.9999?	☐	☑	☐	5 9s + 7 (.999997)
16. Is a linear range analysis curve run over the range of interest to check for interferences?	☐	☑	☐	
17. Are the EPA Method 200.7 lines being used?	☐	☑	☐	
18. Do you keep an instrument maintenance log?	☐	☑	☐	
19. Do you have EPA check samples for interference?	☐	☑	☐	
20. If the argon is not liquid, how pure is it?	☐	☑	☐	Liq Ar used

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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION

RECORD-KEEPING AND CALIBRATION PRACTICES

RD-KEEPING	NA	YES	NO		COMMENTS
the temperature of all B.O.D. incubators recorded daily?	☐	☑	☐	CREC 01	
2. Is the temperature of all drying ovens recorded daily?	☐	☑	☐	CREC 02	
3. Is the temperature of all refrigerators recorded daily?	☐	☑	☐	CREC 03	
4. Are the laboratory thermometers calibrated against an NBS traceable thermometer and documented?	☐	☑	☐	CREC 04	
5. Is the analytical balance checked monthly with two class S weights, one in the mg range, and one in the gram range, and the data recorded?	☐	☑	☐	CREC 05	
6. Is a record available of yearly service on the analytical balance?	☐	☑	☐	CREC 06	
7. Is the pH meter checked daily, or before use, by setting the meter to pH7 then measuring and recording pH's approximately 4 and 10?	☐	☑	☐	CREC 07	
8. Is the conductivity of the distilled water supply (satisfactory is conductivity of 2.0-0.5 umho/cm. at 25° C.) checked daily and the data recorded?	☐	☑	☐	CREC 08	used to record cal Buffers & KCl Calibration
9. Is the conductivity meter calibrated daily against a 0.001 M KCl solution and the data recorded?	☐	☑	☐	CREC 09	Check daily
10. Is the turbidimeter calibrated daily, or before use, with a 40 NTU formazin standard and the data recorded?	☐	☑	☐	CREC 10	
11. Is the DO meter calibrated weekly against the Winkler method and the data recorded?	☐	☑	☐	CREC 11	done weekly

CALIBRATION PRACTICES

arding calibration curves, are the following practices in use? Graph is labeled with parameter, date of calibration and the axes are properly identified as to absorbance or percent transmission and concentration units.	☐	☑	☐	CCAL 01	
b. Computer read-out for regression analysis lists parameter, date of calibration, equation of curve and correlation co-efficient.	☐	☑	☐	CCAL 02	
c. Results reported are within the range of the highest and lowest standard.	☐	☑	☐	CCAL 03	
2. Regarding manual spectrophotometric calibration curves, are the following practices in use?					
a. A minimum of 5 standards and a blank, with 3 measurements at each point are used to generate the curve.	☐	☑	☐	CCAL 04	for metals.
b. A new curve is generated every 3 months.	☐	☑	☐	CCAL 05	for each analyses
c. The working curve is checked daily or with each run by alternating a low and a high standard and the data are recorded.	☐	☑	☐	CCAL 06	
3. Regarding calibration curves for auto-analyzer analyses, are the following practices in use?					
a. The baseline is set using appropriate reagents and distilled water and is checked at the end of the run.	☐	☑	☐	CCAL 07	
b. A minimum of 5 standards are used to generate the curve.	☐	☑	☐	CCAL 08	up to 9 for CID
c. A new curve is generated for each run.	☐	☑	☐	CCAL 09	
d. A marking standard is included with every 20 samples.	☐	☑	☐	CCAL 10	Every 10 samples a high & low std.
e. The calibration curve is checked at the end of each run with a low and a high standard and the data are recorded.	☐	☑	☐	CCAL 11	
4 Regarding atomic absorption calibration curves, are the owing practices in use?					
Working standards are prepared fresh with each run.	☐	☑	☐	CCAL 12	
b. A minimum of 5 standards and a blank are used to generate a curve.	☐	☑	☐	CCAL 13	AE 5000 – 3 + Blank
c. A new curve is generated for each run.	☐	☑	☐	CCAL 14	Reset Back

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NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION

QUALITY CONTROL AND DATA HANDLING

Control Limits for PCB's per 40 manually

	NA	YES	NO	COMMENTS
QUALITY CONTROL				
1. Regarding standard solutions, are the following practices in use?				
a. A notebook record is available describing the preparation and standardization of stock standard solutions.	☐	☑	☐	COQCS 01
b. Are purchased standards checked before use?	☐	☑	☐	COQCS 02
c. Stock standard solutions and working standards are labeled with reagent, concentration, date prepared and initialed.	☐	☑	☐	COQCS 03
d. ACS grade or analytical reagent grade chemicals dated when received, are used in the preparation of standard solutions.	☐	☑	☐	COQCS 04
2. Regarding the monitoring of precision, are the following practices in use?				
a. Approximately 1 synthetic known control sample is included with every 20 analyses, and the data presented on an X bar control chart.	☐	☑	☐	COQCP 01
b. Approximately 1 duplicate of a natural sample is included with every 20 analyses, and the data presented on an R bar range control chart.	☐	☑	☐	COQCP 02
3. Regarding the determination of chemical recovery, are the following practices in use?				
A tabulation and control chart are available for recovery data obtained from spiked natural samples (1 for every 20 analyses).	☐	☑	☐	COQCP 03
4. Is there an in-house quality control manual outlining Q.C. practices?	☐	☑	☐	COQCP 04 — 04/04/89
DATA HANDLING				
1. Regarding sampling procedures and data handling, data reporting and data retrieval procedures, are the following practices in use?				
a. Are sample collectors supplied with properly labeled containers, preservatives and sampling instructions? (Get copy of instructions).	☐	☑	☐	CDAT 01
b. Is there a lab daily work sheet listing sample number, date, time, location, preservation, analyses requested, field measurements by sampler, sampler's initials, date and hour received by lab, analysis, date and hour of analysis, analyst's initials?	☐	☑	☐	CDAT 02
c. Is there a bound lab notebook for recording raw data, calculations, or other notes.	☐	☑	☐	CDAT 03
d. Is raw data kept for 5 years?	☐	☑	☐	CDAT 04
e. Is enforcement data kept for 5 years?	☐	☑	☐	CDAT 05
f. Is there an in-house methods manual available to all analysts?	☐	☑	☐	CDAT 06
g. Is there a record of chain of custody?	☐	☑	☐	CDAT 07
: there a chain of custody procedure?	☐	☑	☐	CDAT 08

Plot of CD & Mean used to monitor trends over time & determine if results are in control limits

AR301551

Form DWR-159 A
7/82

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

ON-SITE LABORATORY EVALUATION

TRIHALOMETHANES ANALYSIS

	NA	YES	NO	COMMENTS
METHODOLOGY — 40 CFR 141 — Appendix C				
1. Purge and Trap	☐	☑	☐	
2. Liquid/Liquid Extraction	☒	☐	☐	
INSTRUMENTATION				
METHOD I				
Purge and Trap Apparatus, Gas Chromatograph with Halide Specific Detector and Temperature Programmer.	☐	☑	☐	
1. Carrier Gas - Helium at 40 ml/minute flow	☐	☑	☐	
2. Columns				
a. 0.1" I.D. x 8 ft. S/S or Glass, 1% SP-1000/carbopack-B (60/80 Mesh)	☐	☑	☐	
b. 0.1" I.D. x 8 ft. S/S or Glass, 0.2% carbowax 1500/carbopack-C (80/100 Mesh)	☐	☑	☐	
c. 0.1" I.D. x 6 ft. S/S or Glass, n-Octane/Porosil-C (100/120 Mesh)	☐	☑	☐	
3. Detectors				
a. Hall electrolytic conductivity detector	☐	☐	☐	
b. Microcoulometric titration	☐	☐	☐	
c. Mass spectrometer	☐	☑	☐	
METHOD II				
Gas Chromatograph with Linearized Electron Capture Detector	☐	☐	☐	
1. Columns				
a. 4 mm I.D. x 2 M. Glass, 3% SP-1000/Supelcoport (100/120 Mesh)	☐	☐	☐	
b. 2 mm I.D. x 2 M. Glass, 10% Squalane/Chromosorb WAW (80/100 Mesh). 25 ml/min. flow carrier gas	☐	☐	☐	
c. 2 mm I.D. x 3 M. Glass, 6% OV-11/4% SP2100/ Supelcoport (100/120 Mesh). 25 ml/min. flow carrier gas	☐	☐	☐	
2. Linearized electron capture detector				
a. ^{63}Ni	☐	☐	☐	
b. Tritium ^{3}H	☐	☐	☐	
c. Other	☐	☐	☐	
3. Halogen specific detectors Electrolytic conductivity detector, microcoulometric detector, mass spectrograph (for > 50 ug/L)	☐	☐	☐	

Form DWR-159 B
7/82

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

ON-SITE LABORATORY EVALUATION

TRIHALOMETHANES ANALYSIS

	NA	YES	NO		COMMENTS
SAMPLING — Rec. Holding Time — 14 days					
1. S.C. Bottle of at least 40 ml capacity with teflon/silicone rubber septum	☐	☑	☐	CTHM 01	
2. Stabilizer - sodium thiosulfate or sodium sulfite (2.5 to 3 mg/40 ml)	☐	☑	☐	CTHM 02	
3. Duplicate Samples — Raw and Finished	☐	☑	☐	CTHM 03	
4. Duplicate Blanks — Ship with Samples	☐	☑	☐	CTHM 04	
ANALYTICAL QUALITY CONTROL					
1. Daily 2 ug/l check sample	☐	☑	☐	CTHM 05	
2. Run blanks prior to samples	☐	☑	☐	CTHM 06	
3. Spike (one every 10), for less than 10 samples, a spike for each	☐	☑	☐	CTHM 07	
4. Duplicate (one every 10) or any sample deviating 30% from norms MS/MSD	☐	☑	☐	CTHM 08	
5. Log of precision and accuracy	☐	☑	☐	CTHM 09	
6. Quarterly spike of E.M.S.L. Q.C. sample in water	☐	☑	☐	CTHM 10	
7. Record of retention times	☐	☑	☐	CTHM 11	keep daily tr record
8. Daily average t_R for each THM and variance of analyses	☐	☑	☐	CTHM 12	
. within 10% of norm in 8 hr. period or find ut why not	☐	☑	☐	CTHM 13	

AR301553

Form DEQ-087 A
12/86

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF QUALITY ASSURANCE

ON-SITE EVALUATION

METHODOLOGY	EQUIPMENT
☐ 503-1	P/T + GC with Photoionization Detector.
☐ 601	P/T + GC + Halide Specific Detector (Electrolytic Conductivity or Microcoulometric)
☐ 602	P/T + GC with Photoionization Detector
☐ 608	Extraction c Methylene Chloride + GC with Electron Capture
☐ 612	Extraction c Methylene Chloride + GC with Electron Capture
☐ 624	P/T + GC/MS
☐ 625	Extraction c Methylene Chloride For Acids + Base Neutrals followed by GC/MS

METHOD 503.1 – Quality Control

1.	Do you analyze the 0.40 µg/l quality control check sample daily before analyzing samples?	☐ Yes	☐ No
2.	Do you analyze the EMSL-Cincinnati volatile organic quality control check samples or their equivalent on a quarterly basis?	☐ Yes	☐ No
3.	Is a sample blank or a method blank analyzed for potential interferences as described in Sections 3.1, 3.2 and 3.4 of Method 503.1?	☐ Yes	☐ No
4.	Do you perform the following instrument status checks:		
	a. peak geometry check?	☐ Yes	☐ No
	b. precision between replicates?	☐ Yes	☐ No
	c. method blank check?	☐ Yes	☐ No
5.	Have you determined the MDL for each compound as in 40 CFR 136 – 10/26/84 – p.198?	☐ Yes	☐ No

METHOD 601 – Quality Control

1.	Do you maintain current accuracy statements for each parameter and concentration (R±S) by analyzing 4 aliquots of spiked waste water and calculating percent recovery (R) and standard deviation(s)?	☑ Yes	☐ No
2.	Do you compare spike data (R±S) with expected recovery (x) and expected standard deviation (p) and reject spike data when S>2p or |X-R|>2p?	☑ Yes	☐ No
3.	Do you analyze 10% spikes and duplicates of samples or at least one/month?	☑ Yes	☐ No
4.	Does the spiking level exceed 2x background level?	☑ Yes	☐ No
5.	Is reagent water analyzed each day to demonstrate the system is under control?	☑ Yes	☐ No
6.	Do you analyze field duplicate blanks for each set of samples?	☑ Yes	☐ No
7.	Are peaks of doubtful identities checked by another column, an element-specific detector or GC/MS analysis?	☑ Yes	☐ No
8.	Is each sample matrix, blank and standard spiked with a surrogate containing Bromochloromethane, 1,4-Dichlorobutane and 2 Bromo-1-Chloropropane.	☑ Yes	☐ No
9.	Do you calculate upper and lower control limits for method performance (R±3S) and observe performance trends with control charts?	☑ Yes	☐ No
10.	Have you determined the MDL for each compound as in 40 CFR 136 – 10/26/84 – p.198?	☐ Yes	☐ No

METHOD 602 – Quality Control

1.	Do you maintain current accuracy statements for each parameter and concentration (R±S) by analyzing 4 aliquots of spiked waste water and calculating percent recovery (R) and standard deviation(s)?	☑ Yes	☐ No
2.	Do you compare spike data (R±S) with expected recovery (x) and expected standard deviation (p) and reject spike data when S>2p or |X-R|>2p?	☑ Yes	☐ No
3.	Do you analyze 10% spikes and duplicates of samples or at least one/month?	☑ Yes	☐ No
4.	Does the spiking level exceed 2x background level?	☑ Yes	☐ No
5.	Is reagent water analyzed each day to demonstrate the system is under control?	☑ Yes	☐ No
6.	Do you analyze field duplicate blanks for each set of samples?	☑ Yes	☐ No
7.	Are peaks of doubtful identities checked by another column, an element-specific detector or GC/MS analysis?	☑ Yes	☐ No
8.	Is each sample matrix, blank and standard spiked with α,α,α-trifluorotoluene?	☑ Yes	☐ No
9.	Do you calculate upper and lower control limits for method performance (R±3S) and observe performance trends with control charts?	☑ Yes	☐ No
10.	Have you determined the MDL for each compound as in 40 CFR 136 – 10/26/84 – p.198?	☑ Yes	☐ No

METHOD 608 – Quality Control

1.	Do you maintain current accuracy statements for each parameter and concentration (R±S) by analyzing 4 aliquots of spiked waste water and calculating percent recovery (R) and standard deviation(s)?	☑ Yes	☐ No
2.	Do you compare spike data (R±S) with expected recovery (x) and expected standard deviation (p) and reject spike data when S>2p or |X-R| >2p?	☑ Yes	☐ No
3.	Do you analyze 10% spikes and duplicates of samples or at least one/month?	☑ Yes	☐ No
4.	Does the spiking level exceed 2x background level?	☑ Yes	☐ No
5.	Is reagent water analyzed each day to demonstrate the system is under control?	☑ Yes	☐ No
6.	Do you analyze field duplicate blanks for each set of samples?	☑ Yes	☐ No
7.	Are peaks of doubtful identities checked by another column, an element-specific detector or GC/MS analysis?	☑ Yes	☐ No
8.	Do you calculate upper and lower control limits for method performance (R±3S) and observe performance trends with control charts?	☑ Yes	☐ No
9.	Have you determined the MDL for each compound as in 40 CFR 136 – 10/26/84 – p.198?	☑ Yes	☐ No

METHOD 612 – Quality Control

Applied

JA

1.	Do you maintain current accuracy statements for each parameter and concentration (R±S) by analyzing 4 aliquots of spiked waste water and calculating percent recovery (R) and standard deviation(s)?	☐ Yes	☐ No
2.	Do you compare spike data (R±S) with expected recovery (x) and expected standard deviation (p) and reject spike data when S>2p or |X-R| >2p?	☐ Yes	☐ No
3.	Do you analyze 10% spikes and duplicates of samples or at least one/month?	☐ Yes	☐ No
4.	Does the spiking level exceed 2x background level?	☐ Yes	☐ No
5.	Is reagent water analyzed each day to demonstrate the system is under control?	☐ Yes	☐ No
6.	Do you analyze field duplicate blanks for each set of samples?	☐ Yes	☐ No
7.	Are peaks of doubtful identities checked by another column, an element-specific detector or GC/MS analysis?	☐ Yes	☐ No
8.	Do you calculate upper and lower control limits for method performance (R±3S) and observe performance trends with control charts?	☐ Yes	☐ No
9.	Have you determined the MDL for each compound as in 40 CFR 136 – 10/26/84 – p.198?	☐ Yes	☐ No

Form DEQ-087 B
12/86

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF QUALITY ASSURANCE

ON-SITE EVALUATION

469 HS → 524.1 –
524.2 –
624 – 10 GC/HS
625 – 4 GC/HS
(3-5)

METHODOLOGY	EQUIPMENT
☐ 503-1	P/T + GC with Photoionization Detector
☐ 601	P/T + GC + Halide Specific Detector (Electrolytic Conductivity or Microcoulometric)
☐ 602	P/T + GC with Photoionization Detector
☐ 608	Extraction ℮ Methylene Chloride + GC with Electron Capture
☐ 612	Extraction ℮ Methylene Chloride + GC with Electron Capture
☑ 624	P/T + GC/MS
☐ 625	Extraction ℮ Methylene Chloride For Acids + Base Neutrals followed by GC/MS

METHOD 624 – Quality Control

1. Do you maintain current accuracy statements for each parameter and concentration (R±S) by analyzing 4 aliquots of spiked waste water and calculating percent recovery (R) and standard deviation(s)? ☑ Yes ☐ No
2. Do you compare spike data (R±S) with expected recovery (x) and expected standard deviation (p) and reject spike data when $S > 2p$ or $|X-R| > 2p$? ☑ Yes ☐ No
3. Does the spiking level exceed 2x background level? ☑ Yes ☐ No
4. Is reagent water analyzed each day to demonstrate the system is under control? ☑ Yes ☐ No
5. Do you analyze field duplicate blanks for each set of samples? IS ☑ Yes ☐ No
6. Is each sample matrix, blank and standard spiked with a surrogate containing bromochloromethane, 1,4-dichlorobutane, 2 bromo-1-chloropropane, pentafluorobenzene, fluorobenzene, ethylbenzene d-10, ethylbenzene d-5, 1,4-difluorobenzene, 1,2-dichloroethane d-4, 4-bromofluorobenzene, or benzene d-6. IS Surr Surr ☑ Yes ☐ No
7. Do you calculate upper and lower control limits for method performance (R±3S) and observe performance trends with control charts? Chlorobenzene d-5 IS Toluene-d8 Surr ☑ Yes ☐ No

PERFORMANCE TESTING AND TUNING:

8. Do you daily inject directly 2µl of BFB solution in 5.0 ml of reagent water and analyze by GC/MS? Do you obtain a background corrected mass spectrum of BFB and check it against the following: ☑ Yes ☐ No

MASS	ION ABUNDANCE CRITERIA
50	15 to 40% of Mass 95
75	30 to 60% of Mass 95
95	Base Peak, 100% Rel. Abundance
96	5-9% of Mass 95
173	<2% of Mass 174
174	>50% of Mass 95
175	5-9% of Mass 174
176	>95% but <101% of Mass 174
177	5 to 9% of Mass 176

9. For each surrogate does the laboratory develop and maintain a separate statement as in 1. above and is the statement checked as in 2. above? ☑ Yes ☐ No
10. Have you determined the MDL for each compound as in 40 CFR 136 – 10/26/84 – p.198? ☑ Yes ☐ No

Form DEQ-087 C
12/88

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF QUALITY ASSURANCE

524.1 –
524.2 –
601/602 –
10 624/625

ON-SITE EVALUATION

METHODOLOGY		EQUIPMENT
☐	503-1	P/T + GC with Photoionization Detector
☐	601	P/T + GC + Halide Specific Detector (Electrolytic Conductivity or Microcoulometric)
☐	602	P/T + GC with Photoionization Detector
☐	608	Extraction ⊂ Methylene Chloride + GC with Electron Capture
☐	612	Extraction ⊂ Methylene Chloride + GC with Electron Capture
☐	624	P/T + GC/MS
☑	625	Extraction ⊂ Methylene Chloride For Acids + Base Neutrals followed by GC/MS

METHOD 625 – Quality Control

1.	Do you maintain current accuracy statements for each parameter and concentration (R±S) by analyzing 4 aliquots of spiked waste water and calculating percent recovery (R) and standard deviation(s)?	☑ Yes	☐ No
2.	Do you compare spike data (R±S) with expected recovery (x) and expected standard deviation (p) and reject spike data when S>2p or |X-R|>2p?	☑ Yes	☐ No
3.	Does the spiking level exceed 2x background level?	☑ Yes	☐ No
4.	Is reagent water analyzed each day to demonstrate the system is under control?	☑ Yes	☐ No
5.	Do you analyze field duplicate blanks for each set of samples?	☑ Yes	☐ No
6.	Is each sample matrix, blank and standard spiked with a surrogate?	☐ Yes	☐ No
7.	For each surrogate does the laboratory develop and maintain a separate accuracy statement as in 1. above, and is the statement checked as in 2. above?	☑ Yes	☐ No
8.	Do you calculate upper and lower control limits for method performance (R±3S) and observe performance trends with control charts?	☑ Yes	☐ No
9.	Do you test the instrument performance with DFTPP at the beginning of each day?	☑ Yes	☐ No
10.	Have you determined the MDL for each compound as in 40 CFR 136 – 10/26/84 – p.198?	☑ Yes	☐ No

11. SUGGESTED INTERNAL AND SURROGATE STANDARDS

3-Surr
6-IS

3-Surr
4-IS

BASE/NEUTRAL FRACTION	ACID FRACTION
Aniline-d_5	✓ 2-Fluorophenol Surr
Anthracene-d_{10}	Pentafluorophenol
Benzo(a)anthracene-d_{12} 12	✓ Phenol-d_6 Surr
4,4'-Dibromobiphenyl	2-Perfluoromethyl phenol
4,4'-Dibromooctafluorobiphenyl	✓ 2,4,6-Tribromophenol Surr
Decafluorobiphenyl	
2,2'-Difluorobiphenyl	
4-Fluoroaniline	
1-Fluoronaphthylene	
2-Fluoronaphthylene	
✓ Naphthalene-d_8	
✓ Nitrobenzene-d_5 Surr	
2,3,4,5,6-Pentafluorobiphenyl	
✓ Phenanthrene-d_{10}	
Pyridine-d_5	

2-Fluorobiphenyl Surr
p-Terphenyl-d14 Surr

✓ 1,4-dichlorobenzene-d_4
✓ Acenaphene-d_{10}
✓ Chrysene-d_{12}
✓ perylene-d_{12}

Form DWR-160 A
5/85

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION

PESTICIDES BY GAS LIQUID CHROMATOGRAPHY

INSTRUMENTATION & GAS SUPPLY

	NA	YES	NO		COMMENTS
1. G.C. equipped with an electron capture detector, an oven capable of isothermal temperature control to at least 210° ± 0.2°C. and ¼" glass columns for direct on-column injection.	☐	☑	☐	GCPA 01	PE/Nelson Access Chrom Nelson data System
2. A potentiometric 10" strip chart recorder compatible with the G.C. with full scale response time < 1 second and variable speeds or an integrator or data system.	☑	☑	☐	GCPA 02	
3. Two stage gas regulators and line filters containing molecular sieve packing to remove contaminants from the gas supply.	☐	☑	☐	GCPA 03	
4. Carrier gas and auxiliary gases at least 99.998% pure.	☐	☑	☐	GCPA 04	
5. At least two glass columns with packings of different polarity.	☐	☑	☐	GCPA 05	

GLASSWARE, EQUIPMENT AND REAGENTS

1. Kuderna Danish concentrators (250, 500 ml) with Snyder columns.	☐	☑	☐	GCPB 01	
2. Chromatographic columns for cleanup of extracts (400 X 20mm with coarse fritted plate and teflon stopcock).	☐	☑	☐	GCPB 02	
3. Pasteur pipets for clean up and transfer of extracts.	☐	☑	☐	GCPB 03	
4. Squibb separatory funnels (60, 2000 ml).	☐	☑	☐	GCPB 04	
Graduated cylinders (100, 1000 ml).	☐	☑	☐	GCPB 05	
mple bottles (1l. glass with teflon lined screwcap).	☐	☑	☐	GCPB 06	
7. Microsyringes (10, 25, 50, 100 µl).	☐	☑	☐	GCPB 07	
8. Erlenmeyer flasks (125, 250 ml).	☐	☑	☐	GCPB 08	
9. Pre-extracted glass wool.	☐	☑	☐	GCPB 09	
10. Florisil PR, 60/100 mesh (stored in dark glass bottle with foil lined cap and activated initially @ 676°C and @ 130°C before use).	☐	☑	☐	GCPB 10	
11. Sodium sulfate, anhydrous dried @ 400°C for 4 hours and stored @ 130°C.	☐	☑	☐	GCPB 11	
12. Pesticide grade solvents: Ethylether, benzene, hexane, petroleum ether, ethyl acetate, iso-octane.	☐	☑	☐	GCPB 12	
13. BF_3/Methanol (14% by weight).	☐	☑	☐	GCPB 13	
14. Potassium hydroxide, sulfuric acid, sodium hydroxide, lauric acid, U.S.P. ethanol, phenolphthalein.	☐	☑	☐	GCPB 14	

STANDARDS

					LOT #	PURITY (%)
1. Endrin	☐	☑	☐	GCPC 01		
2. Lindane	☐	☑	☐	GCPC 02		
3. Methoxychlor	☐	☑	☐	GCPC 03		
4. Toxaphene	☐	☑	☐	GCPC 04		
5. 2,4-D	☐	☑	☐	GCPC 05		
6. 2, 4, 5-TP (Silvex)	☐	☑	☐	GCPC 06		
7. Aldrin	☐	☑	☐	GCPC 07		
8. Dieldrin	☐	☑	☐	GCPC 08		
o'-DDD	☐	☑	☐	GCPC 09		
p'-DDE	☐	☑	☐	GCPC 10		
11. p,p'-DDT	☐	☑	☐	GCPC 11		
12. Heptachlor	☐	☑	☐	GCPC 12		
13. Chlordane	☐	☑	☐	GCPC 13		
14. Pentachlorophenol	☐	☑	☐	GCPC 14		

Form DWR-160 B
5/85

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

ON-SITE LABORATORY EVALUATION

PESTICIDES BY GAS LIQUID CHROMATOGRAPHY

METHODOLOGY

	NA	YES	NO		COMMENTS
1. Do you use the method for organo chlorine pesticides given in Standard Methods, 14th edition, p. 555 for drinking water samples? $MeCl_2 \rightarrow$	☑	☐	☐	GCPD 01	608 used
2. Do you extract the sample with 15% ethyl ether in hexane, washing the sample bottle 2x?	☐	☑	☐	GCPD 02	
3. Does your extract concentrate (5 ml) have any color?	☐	☑	☐	GCPD 03	
4. Is so, do you clean it up with florisil chromatography?	☐	☑	☐	GCPD 04	
5. Are analyses done on at least two columns of different polarity for confirmation? (Such as 5%OV-210 on 100/120 Gas ChromQ and 1.5% OV-17/1.95% QF-1 on 100/120 Gas Chrom Q)	☐	☑	☐	GCPD 05	PB 608 & Cap col.
6. Do you inject an aliquot of ~~5.0 µl~~? 2 µl	☐	☑	☐	GCPD 06	~~DB 1701~~ Dual-ECD
7. Is the sample peak adjusted by dilution to close approximation of a standard peak height?	☐	☑	☐	GCPD 07	
8. Is the sample peak height within the linearity range of your detector for that pesticide?	☐	☑	☐	GCPD 08	
9. Do you use method 608 or 625 for organochlorine pesticides in wastewater samples?	☐	☑	☐	GCPD 09	
10. Do you use the method for pentachlorophenol given in USEPA method for Benzidine, Chlorinated Organic Compounds, Pentachlorophenol and Pesticides in Water and Wastewater (1978)?	☑	☐	☐	GCPD 10	
11. Do you use the method for chlorinated phenoxy herbicides given in Standard Methods, 14th edition, p. 565 for drinking water samples?	☐	☑	☐	GCPD 11	509B Packed col Sp 2250
12. Do you extract the sample with ethyl ether?	☐	☑	☐	GCHD 12	
13. Do you dry the extract at least 2 hours with acidified Na_2SO_4 after hydrolysis?	☐	☑	☐	GCHD 13	
14. Do you esterify the sample for 30 minutes at 50°C with BF_3?	☐	☑	☐	GCHD 14	
15. Do you do a final cleanup with florisil?	☐	☑	☐	GCHD 15	Backup
16. Do you inject at least ~~5.0 µl~~ aliquot? 2 µl	☐	☑	☐	GCHD 16	
17. How do you determine peak size? (Triangulation, height, other)	☐	☑	☐	GCPD 17	(Integrator — Nelson
18. What injection method do you employ?	☐	☑	☐	GCPD 18	~~Autosample~~ System gets Max Concentration

QUALITY CONTROL & STANDARD PREPARATION

1. Do you run a solvent blank to test the purity of the solvents?	☐	☑	☐	GCPE 01	
2. Do you run spiked water samples to test for recovery and graph results on a Shewhart control chart?	☐	☑	☐	GCPE 02	Recov data available
3. Do you run duplicated periodically and graph results on a Shewhart control chart?	☐	☑	☐	GCPE 03	
4. Do you record standard preparation in a bound notebook, giving this data: Compound, gross, tare, net weights, purity, adjusted net weight, date, analyst, solvent, and concentration (ng/µl)?	☐	☑	☐	GCPE 04	
5. Do you keep this data for concentrated, intermediate, and working standards and label them with it?	☐	☑	☐	GCPE 05	
6. Do you keep a column log as required in NJAC7:18/4.7/17?	☐	☑	☐	GCPE 06	

Form-DWR-160 C
5/85

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF SCIENCE AND RESEARCH

ON-SITE LABORATORY EVALUATION

PESTICIDES BY GAS LIQUID CHROMATOGRAPHY

QUALITY CONTROL & STANDARD PREPARATION (Continued)

	NA	YES	NO		COMMENTS
7. Do you prime the column after a shutdown with 40 µl of priming mixture (1 ng/µl for each) using a dedicated syringe?	☐	☐	☑	GCPE 07	
8. Can you tell when your detector is dirty? (Reverse solvent peak)	☐	☑	☐	GCPE 08	
9. Are standards stored in a refrigerator @ 4°C where no pesticide samples are stored and renewed every 6 months?	☐	☑	☐	GCPE 09	
10. Do you have a rubber stamp for charts listing: instrument, column, detector, gas flow, lab name, operator name, temp program, etc.?	☐	☑	☐	GCPE 10	
11. Do you use dibutyl chlorendate as a surrogate?	☐	☑	☐		

SAMPLING (Pres - 4°C)

1. Do you record date, time place, collector, type of sample and preservation in a permanently bound book?	☐	☑	☐	GCPF 01	
2. Does the sample come in contact with only glass, teflon and aluminum foil?	☐	☑	☐	GCPF 02	
3. Do you take a 1L. sample?	☐	☑	☐	GCPF 03	
4. Is the sample run immediately and if not, stored @ 4°C? (May be so stored up to a week for chlorophenoxy herbicides and chlorinated hydrocarbons, 40 days if extracted for wastewater analysis?)	☐	☑	☐	GCPF 04	
5. Do you record in a bound note book date and hour received in laboratory, analyst, date and hour of analysis, method used, results? (If referred to another laboratory, is copy of their report sent to requestor?)	☐	☐	☑	GCPF 05	
6. Is sample pH in the range of 5 to 9?	☐	☑	☐	GCPF 06	

COLUMNS

1. Are the new columns silylated to reduce the number of adsorption sites which can cause decomposition of endrin, using a dedicated syringe which is cleaned promptly.	☐	☑	☐	GCPG 01	Tris Lucas are Silyl Col purch Silyl
2. Do you know the symptoms of overloading? (Depressed peak height, peak tailing and broadening, and breakdown of p,p'-DDT)	☐	☑	☐	GCPG 02	
3. Are inserts replaced to prevent overloading?	☐	☑	☐	GCPG 03	
4. Is a standard containing endrin and p,p'-DDT injected daily to determine breakdown peaks and as an oven temperature check?	☐	☑	☐	GCPG 04	
5. Are glass wool plugs in inlet end of column changed periodically?	☐	☑	☐	GCPG 05	

GLASSWARE CLEANING PROCEDURE

1. Soaking and washing in a high temperatue (50°C) bath of synthetic detergent (e.g., Alconox) in water. Frits + Syring	☐	☑	☐	GCPH 01	
2. Rinsing with tap water. Frits + Syring	☐	☑	☐	GCPH 02	
3. For concentrating glassware, and pipets give a 15 minute soak in 40-50°C chromic acid cleaning solution after the tap water rinse. Follow this with another tap water rinse.	☐	☑	☐	GCPH 03	
4. Rinse with distilled water.	☐	☑	☐	GCPH 04	
5. Rinse with acetone.	☐	☑	☐	GCPH 05	
6. Air dry large items on neoprene covered metal racks. Dry small items by wrapping in aluminum foil and oven drying. Store in aluminum foil. Keep large items in a dust-free cabinet.	☐	☑	☐	GCPH 06	
7. Rinse before use with solvent to be used in the analysis.	☐	☑	☐	GCPH 07	

(MeCl)-Hexane Wash

AR301560

Golder Associates Inc.

20000 Horizon Way, Suite 500
Mt. Laurel, NJ USA 08054
Telephone (609) 273-1110
Fax (609) 273-0778

Golder Associates

HEALTH AND SAFETY PLAN
BERKS LANDFILL RI/FS
BERKS COUNTY, PENNSYLVANIA

ATTORNEY CLIENT WORK PRODUCT

PRIVILEGE COMMUNICATION
CONFIDENTIAL

Prepared by/Reviewed by Health and Safety Officer

Printed Name _____

Signature _____ **Date** _____ **19__**

Reviewed by Site Health and Safety Coordinator

Printed Name _____

Signature _____ **Date** _____ **19__**

Approved by Project Manager

Printed Name _____

Signature _____ **Date** _____ **19__**

May 1992 **Project No. 913-6389**

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1.0 GENERAL CONSIDERATIONS

1.1 Introduction

The purpose of this document is to establish standard health and safety procedures for Site personnel during Site activities involved with the Remedial Investigation (RI) conducted at the Berks Landfill located in Berks County, Pennsylvania. The activities during the RI will include leachate, surface water and soil sampling, well drilling, core hole drilling, flow measurements and a wetlands investigation.

The levels of personal protection and the procedures specified in this plan are based on the information received to date and represent the minimum health and safety requirements to be observed by all personnel while engaged in this project. This document will be reviewed after the data evaluation discussed in Section 3 of the RI/FS Work Plan (See Volume I). Unforeseen Site conditions or personal preferences may warrant the use of higher levels of protection. Any additional health and safety procedures that are required by the owner/operator of the on-Site facility that are more stringent than the procedures specified herein or that may be compiled in the future for specific (additional) tasks must be followed.

Project personnel must read this document carefully. If you have any questions or concerns which you feel are not adequately addressed, ask the Project Manager, Health and Safety Officer or available Site Health and Safety Coordinator. Follow the designated health and safety procedures, be alert to the hazards associated with working on any construction Site in close proximity to heavy equipment, and above all else, use common sense, and exercise reasonable caution at all times.

1.2 Designated Safety Personnel and Chain of Command

The personnel responsible for the health and safety of the project staff on this project are the Site Health and Safety Coordinator, the Health and Safety Officer and the Project Manager. These individuals, as well as their alternatives, are identified in Table 1.

The Health and Safety Officer has overall responsibility for establishing appropriate health and safety procedures for the project and shall have the requisite authority to implement those procedures including, if necessary, the authority to temporarily shut the project down for health and safety reasons.

The Site Health and Safety Coordinator is responsible for assuring that the designated procedures are implemented in the field including, if necessary, the authority to temporarily shut the project down for health and safety reasons.

The Project Manager has the overall responsibility for project health and safety and shall have the authority to take whatever actions may be necessary to provide a safe working environment for all personnel.

The ultimate responsibility for the health and safety of the individual employee rests with the employee themselves, and their colleagues. Each employee is responsible for exercising the utmost care and good judgment in protecting their own health and safety and that of fellow workers. Should a potentially unsafe situation exist, it is the responsibility of the employee to bring that situation to the attention of the appropriate health and safety personnel as designated above. Should the project require the employee to engage in potentially unsafe activities as a result of poor planning, oversight, changing conditions,

etc., it is not only the right, but the responsibility, of the individual to contact the Site Health and Safety Coordinator, Health and Safety Officer and/or Project Manager to re-evaluate the situation and determine the appropriate course of action.

1.3 Medical Surveillance and Training

All personnel engaged in on-Site activities on this project must have had baseline physical examinations in the year prior to commencing work and be participants in medical surveillance program. In addition, all on-Site personnel must be trained in hazardous waste Site investigation health and safety including respiratory protection, personal protective clothing, decontamination, and the proper calibration and use of air monitoring equipment. This training shall be in accordance with 29 C.F.R. 1910.120(e).

1.4 Respiratory Protection

All employees who may be required to use air purifying respirators must be included in the medical surveillance program and be approved for the use of respiratory protection by a licensed physician. Prior to using any air purifying respirator in the field, each employee must be qualitatively fit tested for the specific size, make, and model of respirator he or she will be using according to the procedures set forth in Appendix C of the 29 CFR 1910.1001 asbestos regulations. All employees will be instructed in the proper use of the respirator and cartridge selection. Beards (including a few days growth), large sideburns, or mustaches, which may interfere with a proper respirator seal, are not permitted.

1.5 General Procedures

The following personal hygiene and work practice guidelines are intended to prevent injuries and adverse health effects. These guidelines represent the minimum standard procedures

for reducing potential risks associated with this project and are to be followed by the project staff at all times.

1. A multi-purpose dry chemical fire extinguisher, a complete field first aid kit, a bottle of emergency eye wash solution, emergency phone numbers, and hospital route map shall be maintained in every Site vehicle and in the Site office.

2. Eating, drinking, smoking, taking medications, chewing gum, etc., is prohibited in the immediate vicinity of the operations.

3. Thoroughly wash hands and, if necessary, face before eating or putting anything in your mouth.

4. Stand upwind of excavations, boreholes, drilling spoils, etc., whenever possible.

5. Be alert to potentially changing exposure conditions as evidenced by perceptible odors, unusual appearance of excavated soils, etc.

6. Do not enter any test pit or trench greater than four feet in depth unless in accordance with procedures specified below.

7. Under no circumstances shall any employee enter or ride in or on any backhoe bucket, materials hoist, or any other similar device not specifically designed for carrying human passengers.

8. Be alert to the potential hazards due to other Site activities or emissions (e.g. gas vents).

9. Be alert to the symptoms of fatigue and heat stress, and their effect on the normal caution and judgment of personnel.

10. Establish prearranged hand signals or other means of emergency communication when wearing respiratory equipment, since this equipment seriously impairs speech communications.

11. Noise may become a health and safety hazard, particularly during drilling and construction activities. A good rule of thumb is that if you have to shout in order to communicate from a distance of three feet in steady state (continuous) noise, you should be wearing hearing protection. Likewise, any impact noise from

activities such as driving casing on a drilling operation which is loud enough to cause discomfort, would also indicate the need for hearing protection. Hearing protection is available and should be included in your standard field kit along with hard hat, safety glasses, etc.

12. Always use an appropriate level of personal protection. Lesser levels of protection can result in preventable exposure; excessive levels of safety equipment can impair efficiency and increase the potential for accidents to occur.

In addition to the above items, a Site Safety Meeting will be held at the outset of each task requiring health and safety procedures. Safety briefings will be given to new personnel prior to their beginning work at the Site. This briefing must be given by the Health and Safety Officer or Site Health and Safety Coordinator and coordinated by the Project Manager. All project personnel must sign an acknowledgement of this briefing. Typical forms to be used for this purpose are attached at the rear of this Health and Safety Plan. Additionally, safety meetings will be conducted by the Site Safety Coordinator following the receipt of monitoring data indicating possible exposures above those anticipated.

1.6 Confined Space, Trench, and Test Pit Entry Procedures

The following procedures apply to the entry of any space having limited egress (access to an exit) and the potential for the presence or accumulation of a toxic or explosive atmosphere. This includes certain trenches particularly those through landfill wastes for capping and seepage control, and entry into or working around any leachate collection manhole.

No employee shall enter any trench greater than four feet in depth unless the sides are shored or laid back to a stable

slope as specified in 29 CFR 1926.652 or equivalent State Occupational Health and Safety Regulations.

When an employee is required to enter a pit or trench four or more feet in depth, an adequate means of access and egress such as a slope of at least 2:1 to the bottom of the pit, or a ladder or steps shall be provided. The travel distance between ladders must not be greater than 25 feet or as specified by State Occupational Health and Safety Regulations. Ladders must extend above the surface of the trench/pit by three feet.

Prior to entering any test pit, trench or manhole which may have the potential for the accumulation of toxic gases or vapors, the atmosphere at the bottom of the pit and at four foot intervals thereafter (if greater than four feet in depth) shall be tested for oxygen deficiency, hydrogen sulfide (H_2S), combustible gases, hydrogen cyanide and organic vapors in that order. Appropriate levels of protection shall be employed as specified in Sections 3 and 4 below.

No employee shall enter any test pit requiring the use of Level C-1 (see Section 4.1) or greater protection, unless a back-up person equipped with a pressure demand self-contained breathing apparatus (SCBA) is present. No back-up person shall attempt any emergency rescue unless a second back-up person equipped with an SCBA is present, or until an appropriate emergency response agency has been notified and additional help is on the way.

1.7 Work Zones

Work zones shall be established for each task as required. The zones and their location will be determined by the extent of work, personnel, and equipment mobility and decontamination requirements for each task. Work zones to be considered for each task include an exclusion zone, a contaminant reduction zone, and a support zone. Should these zones be required to be established during any RI/FS task they will be delineated by wooden stakes and flagging or an equivalent method.

2.0 SITE BACKGROUND AND PROJECT DESCRIPTION

2.1 Site Background and Existing Conditions

The Berks Landfill is a closed municipal solid waste landfill. The USEPA has indicated in the Administrative Consent Order that the landfill contains or may contain leachate and other hazardous substances as described below.

The following volatile organic compounds (VOCs) have been detected in samples from on-Site groundwater monitoring wells:

vinyl chloride (up to 542 ppb),
trichloroethylene (up to 316 ppb)
methylene chloride (up to 689 ppb),
trans-1,2-dichloroethylene (up to 379 ppb),
acetone (up to 2030 ppb),
benzene (up to 38 ppb),
4-methyl-2-pentanone (up to 2130 ppb),
toluene (up to 374 ppb),
2-hexanone (up to 215 ppb),
xylenes (up to 151 ppb),
ethylbenzene (up to 104 ppb),
2-butanone (up to 3360 ppb),
chlorobenzene (up to 40 ppb),
tetrachloroethylene (up to 10 ppb),
1,1,1-trichloroethane (up to 83 ppb),
1,1-dichloroethane,
1,2-dichloroethane,
chloroethane, and
1,2-dichloropropane.

The leachate (seepage) samples contained the following VOCs:

toluene at 400 ppb,
trichloroethane at 100 ppb,
2-butanone at 240 ppb,
ethylbenzene at 130 ppb, and
vinyl chloride at 62 ppb.

Samples from the leachate lagoons contained:

vinyl chloride at 5 ppb to 12 ppb,
2-butanone at 14 ppb to 140 ppb,
toluene at 62 ppb,
total xylenes up to 48 ppb,
ethylbenzene up to 12 ppb,
di-noctyl phthalate up to 65 ppb,
2-hexanone up to 12 ppb and
lead at 128 ppb.

The most recent sampling of the leachate (March 20, 1990) indicated:

19.7 ppb acetone,
4.8 ppb cis-1,2-dichloroethene,
5.0 ppb toluene,
4.7 ppb total xylenes, and
1.4 ppb 1,4-dichlorobenzene.

2.2 Project Description

The Berks Landfill (RI) is being undertaken to define the nature and extent of the migration of compounds of concern from the Site. The data obtained during the RI will then be used in a Feasibility Study (FS) to develop and evaluate Remedial Action Alternatives.

In order to achieve the objectives of the RI/FS a field investigation program consisting of test borings, monitoring well installation, geological mapping, and environmental sampling (groundwater, surface water, soil/sediment and leachate) will be carried out at the Site. A detailed description of the Site, Site conditions and work to be carried out is presented in the RI/FS Work Plan (Volume 1).

2.3 Potential Hazards

Although not currently specified, this project may involve drilling and/or excavation through or adjacent to old landfill areas that are suspected to contain industrial wastes that today might be designated as hazardous waste. Based on existing data obtained during recent fence installation, time weighted average exposure levels for personnel working on non-intrusive tasks in the old landfill areas are expected to be low. However, groundwater data and air sampling conducted at the perimeter of the landfill, are not necessarily indicative of potential short term exposure scenarios that may arise should workers encounter isolated pockets of more highly concentrated material.

The possibility of encountering significant quantities and concentrations of any or all of the substances and/or conditions discussed above cannot be discounted, and hence must be anticipated and addressed.

Potential hazards include:

1. Inhalation of organic vapors due to the presence of volatile organics such as toluene, xylene, vinyl chloride, etc. in excavated waste, soil, and groundwater.

2. Inhalation or ingestion of particulate (dust) contaminated with organic chemicals, metals, or pathogens.

3. Dermal exposure and possible percutaneous (skin) absorption of certain lipophilic (readily absorbed through the skin) inorganic and organic chemicals and metals.

4. Slips, trips, falls, bumps, cuts, pinch points, falling objects, crushing injuries, etc., typical of every construction-related job Site. This Site has a higher than average potential of trips and falls due to the number of large stones exposed at the Site and steep slopes.

5. Physical hazards such as noise and heat/cold stress.

Potential chemical hazards at the Site are summarized in Table 1. Exposure via the ingestion route can be greatly reduced if not completely eliminated by the use of gloves, good personal hygiene habits, and restrictions on smoking, eating, and drinking in contaminated areas.

Similarly, dermal exposure can be eliminated by good personal hygiene, the use of gloves and appropriate personal protective clothing, and conscientious personal decontamination procedures.

3.0 AIR MONITORING AND ACTION LEVELS

Action levels for selection of respiratory protection and confined space entry are given in Table 3. Each parameter is further discussed below.

3.1 Oxygen Deficiency, Combustible Gases, Hydrogen Sulfide and Cyanide

Situations that are of most concern from a health and safety standpoint are those that are potentially "IDLH" or immediately dangerous to life and health.

IDLH situations are most commonly associated with oxygen deficient atmospheres, explosive atmospheres, and acutely toxic chemical asphyxiants such as hydrogen sulfide (H_2S) and hydrogen cyanide (HCN).

The Site Health and Safety Coordinator shall have an MSA 361 oxygen, combustible gas, and hydrogen sulfide detector or equivalent instrument(s), and an MSA "Samplair", Draeger, or equivalent pump, and hydrogen cyanide detector tubes (MSA P/N 93262 or equivalent) on Site at all times during intrusive activities.

Prior to entering any trench or test pit, the air in the pit will be monitored for oxygen, hydrogen sulfide, combustible gases, hydrogen cyanide, and VOCs, in that order. Oxygen levels below 19.5 percent require the use of pressure demand self contained breathing apparatus or a pressure demand air line respirator with escape pack.

Air purifying respirators equipped with organic vapor/acid gas cartridges are quite effective in removing H_2S and HCN but are not approved for such use due to the potential for the sudden build up of IDLH concentrations. The use of cartridge type air purifying respirators in atmospheres containing H_2S or HCN at concentrations in excess of the

eight hour threshold limit value (TLV), short term exposure limit (STEL) or TLV ceiling value (C) is permitted only for escape. Entry into any atmosphere containing greater than 10 ppm hydrogen cyanide (ceiling value) or 10 ppm hydrogen sulfide (15 ppm STEL) requires the use of a pressure demand supplied air respirator with escape provisions.

No employee shall enter any trench or test pit with combustible gas concentrations greater than 25 percent LEL (lower explosive limit). The pit must be allowed to aerate naturally or may be actively ventilated. In the case of a municipal landfill, combustible gas readings are most likely due to the presence of methane gas which is odorless and does not show up on the HNU (or other photoionization detector). Therefore, the combustible gas indicator should be calibrated to methane.

Employees should be aware of the fact that "25 percent of the LEL" represents a concentration of several thousand to tens of thousands parts per million of a gas or vapor in air depending on the particular gas. If there is any reason to suspect that a combustible gas reading is due to anything other than methane (i.e solvent odors, high readings on HNU etc.), there is a high likelihood that a toxicity hazard exists as well as the explosion hazard and the action level and procedures discussed in Section 3.2 below will also apply.

High combustible gas levels (up to 100 percent LEL) are not of tremendous concern at depth in a boring or well if oxygen levels are below 12 percent, and readings are less than 25% LEL at the top of the borehole. Under these circumstances, employees should continue to closely monitor conditions, and stand well clear (at least five feet), and upwind of the mouth of the hole.

If, however, it is apparent that methane gas is entering the hole under pressure and levels at the top of the hole exceed 25 percent of the LEL, employees must exercise extreme caution. Smoking should not be permitted within fifty feet of the hole. Drilling equipment should be raised and lowered slowly to minimize the possibility of sparking and employees should stand clear of the hole. An inflatable bladder should be inserted in the well casing and combustible gas levels checked both inside the casing and around the outside at ground level, prior to any welding.

3.2 VOC Monitoring

Substances that are most hazardous from a chronic inhalation standpoint are those that are relatively volatile, highly toxic (i.e low threshold limit value), and have odor threshold much higher than the TLV. Vinyl chloride and benzene, both of which were previously detected in Site groundwater samples, fall into this category.

The designated Site Health and Safety Coordinator shall have an 10.6 eV HNU or equivalent on Site at all times and will establish "background readings" well upwind of any excavation, spoils pile, borehole, etc.

Given the fact that benzene, and vinyl chloride, are confirmed or suspected human carcinogens, any consistent readings in the breathing zone that are perceptibly above the upwind background for more than fifteen minutes, or any readings in the breathing zone greater than 5 ppm above background (other than a momentary peak) shall be the action level for donning half face air purifying respirators equipped with organic vapor acid gas cartridges. Given the rapid breakthrough time of vinyl chloride, cartridges will be replaced after each day of use, or after four hours of actual use, whichever is less.

Any readings consistently greater than 10 ppm above background for fifteen minutes, greater than 25 ppm above background for five minutes, or any peak reading greater than 50 ppm in the breathing zone will be the action level for either temporarily discontinuing work, or upgrading the level of respiratory protection to "Level B" (SCBA's).

4.0 PERSONAL PROTECTIVE CLOTHING AND RESPIRATORY PROTECTION

4.1 Personal Protective Equipment

The rationale for use of personal protective equipment during the project is outlined in Table 3. The initial level of personal protective clothing required at the Site will be D-1.

LEVEL D-1 PROTECTION

1. a normal work uniform;
2. a hard hat;
3. safety glasses; and,
4. steel toed boots.

Chemically resistant gloves shall be worn whenever it is necessary to handle waste, wet soil, or groundwater. This level shall be upgraded to level D-2 when tasks are such that there is the likelihood of inadvertently contacting wastes or other potentially contaminated material.

LEVEL D-2 PROTECTION

1. One or two piece Tyvek suit or splash suit if splash hazard exists.
2. Cloth coveralls (long pants and shirt sleeves).
3. Steel toed rubber boots.
4. Safety glasses or safety goggles if splash hazard exits.
5. Hard Hat.
6. Chemically resistant gloves.
7. Inner gloves of PVC or latex rubber.

LEVEL C-2 PROTECTION

D-2 plus air purifying respirator using organic vapor/acid cartridges (plus dust and mist filters if dusty conditions exist).

LEVEL C-3 PROTECTION

1. Comfortable field clothing (long pants and shirt sleeves).
2. Hard hat.
3. One piece Tyvek inner suit.
4. Inner gloves of PVC or latex taped to inner Tyvek.
5. Hooded one piece waterproof outer suit (Saranex or PVC "Nuke Suit").
6. Outer chemically-resistant gloves taped to outer suit.
7. Solvent resistant steel toed rubber boots taped to outer suit.
8. Full-face air purifying respirator.

LEVEL B-2 PROTECTION

D-2 plus pressure demand supplied-air respirator.

LEVEL B-3 PROTECTION

C-3 with pressure demand supplied-air respirator in place of full-face air purifying respirator.

4.2 Heat Stress

Working in protective clothing can greatly increase the likelihood of heat fatigue, heat exhaustion, and heat stroke, the latter being a life threatening condition. All employees are to be alert to the possibility and symptoms of heat stress. The employee is to leave the work area, rest, cool off, and drink plenty of water/Gatorade/Squencher, etc., should any of the following symptoms occur: extreme fatigue, cramps, dizziness, headache, nausea, profuse sweating, pale clammy skin. If the symptoms do not subside after a reasonable rest period, the employee shall notify the Project Supervisor or Site Health and Safety Coordinator and seek medical assistance. Personnel will be aware that

natural or induced (due to protective clothing) humidity is a major factor in heat-related problems. Personnel will exercise increased vigilance during high humidity situations.

4.3 Cold Stress

Cold weather can produce vasoconstriction of the hands, hypothermia, anoxia, frostbite, and freezing. All employees are to be alert to the possibility and symptoms of cold stress. Protective measures for cold stress include wearing a hat and covering the neck, protective clothing for the hands and other exposed areas, layers of clothing to increase trapped air (insulation), and adequate footware. If the symptoms of shivering, burning sensations, or extreme pain occur, the employee should immediately seek shelter and warmer temperatures.

Some solvents, gasolines and compressed gases on contact with skin can increase the likelihood and severity of frostbite. Protective measures such as gloves shall be taken when handling these materials.

5.0 DECONTAMINATION AND WASTE HANDLING

A source of clean water for personal and equipment decontamination is to be available on Site. A source, such as 5 gallon jerry cans, must be brought on Site on a daily basis. Adequate amounts must be kept on hand for personal and equipment decontamination. A separate source of drinking water shall also be maintained.

All visible contamination, i.e., mud, will be scraped, brushed, washed and/or scrubbed off of boots and outer gloves. Tyvek suits will be removed and discarded prior to leaving the Site. All discarded items shall be placed in plastic bags and then in appropriately marked containers in a designated area for ultimate disposal. All spent decontamination fluids will be contained for disposal.

All drill cuttings generated during the drilling process will be collected and placed in containers or "sandwiched" within plastic sheeting and stored at the Site.

All water purged from boreholes prior to sampling or generated during development of newly drilled wells will be directed or pumped to the leachate collection system or leachate manhole to be processed in a similar manner to leachate currently treated at the Site.

6.0 CONTINGENCY AND EMERGENCY RESPONSE PLANS

The following procedures have been established to deal with emergency situations that might occur during operations. Project staff shall have means of communication on Site, or be within visual or voice communication range of someone who does, at all times. Project staff should familiarize themselves with the location of the nearest phone, and the designated medical facilities which will be posted at the Project Site. In the event of an emergency situation, Project staff shall follow the procedures specified below. When help arrives, Project staff defer all emergency response authority to appropriate responding agency personnel.

If an unanticipated, potentially hazardous situation arises as indicated by instrument readings, visible contamination, unusual or excessive odors, etc., project personnel shall temporarily cease operations, move away to a safe area, and contact the Health and Safety Officer or Project Manager.

In the event of a serious emergency situation, project staff shall contact the local fire department, or paramedics as appropriate and inform them of the nature of the emergency, and then notify the Project Manager and the Health and Safety Officer. A list of important telephone numbers is listed at the end of Section 5.

6.1 Medical Emergency Response Plan

Should any person visiting or working at the Site be injured or become ill, notify the on-Site Health and Safety Coordinator and initiate the following emergency response plan:

Note: The expected nature of chemical contamination on this project is not anticipated to present an immediate threat to human health. Other than removal of outer garments and

gross contamination (i.e., mud), immediate emergency treatment of injuries should take precedence over rigorous personal decontamination.

1. If able, the injured person should proceed to the nearest available source of first aid. If the injured party is extremely muddy, remove outer garments and if necessary, wash the injured area with soap and water.

2. If the victim is unable to walk, but is conscious and there is no evidence of spinal injury, escort or transport the injured person to the nearest first aid facility. If the victim cannot be moved without causing further injury such as in the case of a severe compound fracture, take necessary emergency steps to control bleeding and immediately call for medical assistance as discussed below.

If the injury involves foreign material in the eyes, immediately flush the eyes with emergency eye wash solution and rinse with copious amounts of water at the nearest emergency eye wash station. Obtain or administer first aid as required. If further medical treatment is required seek medical assistance as discussed below.

If the victim is unconscious or unable to move, do not move the injured person unless absolutely necessary to save his or her life, until the nature of the injury has been determined.

If there is any evidence of spinal injury do not move the victim unless absolutely necessary to save his or her life. Administer CPR if the victim is not breathing, control severe bleeding, treat for shock and immediately seek medical assistance as discussed below.

3. If further medical treatment is required and:

a. The injury is not severe, contact and take the injured party to the clinic/hospital by private automobile.

b. The injury is severe, immediately call Paramedics (911). In the interim, determine the status of the Reading Hospital (215) 378-6218 and advise them of the situation.

4. If the injured person is a Project staff member, a fellow Project staff member will accompany the injured person to the hospital to ensure prompt and proper medical attention. After proper medical treatment has been obtained, the companion staff members should notify the Health and Safety Officer and the Project Manager and prepare a written report.

6.2 Fire and Explosions

The dry chemical fire extinguishers provided to project personnel are effective for fires involving ordinary combustibles such as wood, grass, etc., flammable liquids, and electrical equipment. They are appropriate for small, localized fires such as a drum of burning refuse, a small burning gasoline spill, a vehicle engine fire, etc. No attempt should be made to use the provided extinguishers for well established fires or large areas or volumes of flammable liquids. Used fire extinguishers shall be recharged or replaced immediately.

In the case of fire, prevention is the best contingency plan. There should be no smoking in the vicinity of any invasive actions on or adjacent to the landfill and smoking materials, where permitted, should be extinguished with care.

Catalytic converters on the underside of vehicles are sufficiently hot to ignite dry grass. Project staff should avoid driving over dry grass that is higher than the ground clearance of the vehicle, and be aware of the potential fire hazard posed by the catalytic converter at all times. Never

allow a running vehicle to sit in a stationary position over dry grass or other combustible materials.

In the event of a fire or explosion:

1. If the situation can be readily controlled with available resources without jeopardizing the health and safety of yourself or other Site personnel, take immediate action to do so. If not:

2. Isolate the fire to prevent spreading if possible.

3. Clear the area of all personnel working in the immediate vicinity.

4. Immediately notify Site emergency personnel and the local fire department. Sinking Spring Police (215) 378-4411, West Wyomissing Fire Company (215) 373-5848.

6.3 Unforeseen Circumstances

The Health and Safety procedures specified in this plan are based on the best information available at the time. Unknown conditions may exist, and known conditions may change. This plan can not possibly account for every unknown or anticipate every contingency. Should substantially higher levels of contamination be encountered in the soil or groundwater, or should any situation arise which is obviously beyond the scope of the monitoring, respiratory protection and decontamination procedures specified herein, work activities shall be modified (such as moving to another location) or halted pending discussion with the Health and Safety Officer and implementation of appropriate protective measures.

Emergency Response Authority

The Site Health and Safety Coordinator shall also act as the designated Site emergency coordinator and shall have final authority for initial response to on-Site emergency situations.

Upon arrival of the appropriate emergency response personnel, the Site health and safety coordinator shall defer all authority but shall remain on the scene if necessary to provide any and all possible assistance. At the earliest opportunity, the Site health and safety coordinator shall contact the project manager or health and safety officer.

Project Manager Randolph White Phone (w) 609-273-1110
(h) _____

Health and Safety W.E. Harris Phone (w) 609-273-1110
Officer (h) _____

Emergency Contacts

1. Hazardous Substance Spills (SARA Title 111)

Pennsylvania Emergency Response Commission
c/o Pennsylvania Emergency Management Agency'
Room B-151
Transportation and Safety Building
Commonwealth and Forster Streets
Harrisburg, PA 17120

(717) 236-7976

2. Hospital

Reading Hospital
6th and Spruce Street
West Reading, PA 19603

Emergency: (215) 378-6218
Main Number: (215) 378-6000

3. Police

Sinking Spring Police
2800 Shillington Road (at Bradley Ave.)
Sinking Spring, PA 19608

Emergency: (215) 378-4911
Main Number: (215) 678-3431

4. Fire

Grill Fire Company
Mt. View Road at Philadelphia Road
Reading, PA 19609

Emergency: (215) 373-5848
Main Number: (215) 775-4808

The 911 emergency telephone number for fire, hospital, and police is also active for this area.

NOTE: **THIS LIST MUST BE POSTED AT THE PROJECT SITE AND IN ALL SITE VEHICLES ALONG WITH THE ATTACHED HOSPITAL ROUTE MAP (FIGURE H1).**

POTENTIAL CHEMICAL HAZARDS

CHEMICAL	INHALATION	INGESTION	DIRECT CONTACT	ABSORPTION	PRIMARY TARGETS
Acetone	x	x	x		resp. sys., skin
Benzene	x	x	x	x	blood, CNS
2-Butanone	x	x	x		CNS, lungs
Chlorobenzene	x	x	x		resp. sys., eyes
1,1-Dichloroethane	x	x	x		skin, liver
1,2-Dichloroethane	x	x	x		skin, liver
trans 1,2-Dichloroethylene	x	x	x		resp. sys., eyes CNS, perf. NS
1,2-Dichloropropane	x	x	x		skin, eyes
Di-n-octyl Phtalate		x			skin, eyes
Ethylbenzene	x	x	x		eyes, upper resp. sys.
Hexane	x	x	x		skin, eyes
2-Hexanone				x	CNS, skin
Lead	x	x	x		GI tract, CNS
4-Methyl 2-pentanone					
Methylene Chloride	x	x	x		skin, CNS
Tetrachloroethylene	x	x	x		liver, kidney
Toluene	x	x	x	x	CNS, liver
Trichloroethanes	x	x	x	x	CNS, eyes
Trichloroethylene	x	x	x		resp. sys., heart
Vinyl Chloride	x				liver, CNS
Xylenes	x	x	x	x	CNS, eyes

Footnotes: resp. sys. = respiratory system
CNS = central nervous system
perf. NS = peripheral nervous system
GI tract = gastrointestinal tract

With the exception of lead, these chemicals share many common symptoms.
The symptoms include: irritations of eyes, nose, throat, respiratory tract; dizziness, weakness, drowsiness, incoordination, and headaches.
Chemicals with CNS targets may cause tingling sensations or loss of sensation at the extremities.
Lead exposures can cause headaches, muscle/joint pain, decreased appetite, insomnia, weakness, weight loss, constipation and cramps.

TABLE 2

AIR MONITORING AND ACTION LEVELS

INSTRUMENT	PARAMETER	FREQUENCY	CONCENTRATION	ACTION(S)
MSA Model 361	Combustible Gases	Initially and during invasive site work	<5% LEL*	Continue investigation.
			5-25% LEL*	Continue with extreme caution.
			>25% LEL*	Halt work, discuss options, including ceasing work at that location.
MSA Model 361	Hydrogen Sulfide (H2S)	Initially and during drilling and/or excavations	>10ppm continuous *	Halt work until levels subside or site personnel are equipped with pressure demand SCBAs.
			or 15 ppm for 15 minutes* or >25 ppm peak*	NOTE: If air purifying respirators with organic vapor acid gas cartridges are worn due to odor nuisance, monitoring must be continuous.
MSA Model 361	Oxygen (O2)	Initially and during confined space entry	19.5% *	Halt work, leave immediate area, assess reason(s) for oxygen deficiency.
Colometric Detector Tubes (e.g., MSA P/N 93262)	Hydrogen Cyanide (HCN)	Periodically if gas is actively venting from auger hole	>1ppm *	Sample at least every 15 minutes until 2 consecutive readings are <1ppm.
			>10ppm *	Cease operations, determine HCN concentration in breathing zone. If detected, in air concentration downwind of hole, cease work until HCN concentration subsides or personnel are equipped with pressure demand SCBAs.
PID	Volatile Organic Compounds (VOCs)	Initially and every 15 minutes thereafter	Consistent reading in breathing space above background for 15 minutes. Any readings in breathing space greater than 5 ppm.*	Cease operations until equipped with SCBAs, levels subside or personnel wear air purifying respirators with organic vapor/acid gas cartridges, and are monitored continuously.
Examples: HNU PI 101 10.6 eV lamp			>10ppm above background for 15 minutes or >25ppm for 5 minutes or >50ppm peak concentration.	Temporarily ceasing work or upgrade to Level B protection with pressure demand SCBA.

* Other than a momentary peak

PERSONAL PROTECTIVE EQUIPMENT RATIONALE			
SITUATION	RESPIRATORY PROTECTION	DERMAL PROTECTION	UPGRADE CRITERIA
Basic Protection	D	1	When conducting, or in the vicinity of other, listed activities or As required by safety personnel
Surface Water Sampling and Flow Measurements	D	1	Upgrade to level C-2 if indicated by air monitoring results.
Wetlands Transit	D	1	Upgrade to C-2/3 or B-2/3 if indicated by air monitoring results. Use Level 3 when likelihood of liquid contact occurs.
Possible inadvertent contact with waste or leachate, drilling through landfill contents.	D	2	When monitoring results indicate need for respiratory protection upgrade to C-2. When dermal contact is other than incidental, upgrade to D-3 or C-3.
Leachate Sampling	C	3	Upgrade to B-3 if indicated by air monitoring results
Note: See the Health and Safety Plan for equipment details			

ATTACHMENT A

Safety Briefing

The following personnel were present at pre-job safety briefing conducted at _____ (time) on _____ (date) at _____ (location), and have read the above plan and are familiar with its provisions:

Name	Signature

Fully charged ABC Class fire extinguisher available on site? YES ___

Fully stocked First Aid Kit available on site? YES ___

All project personnel advised of location of nearest phone? YES ___

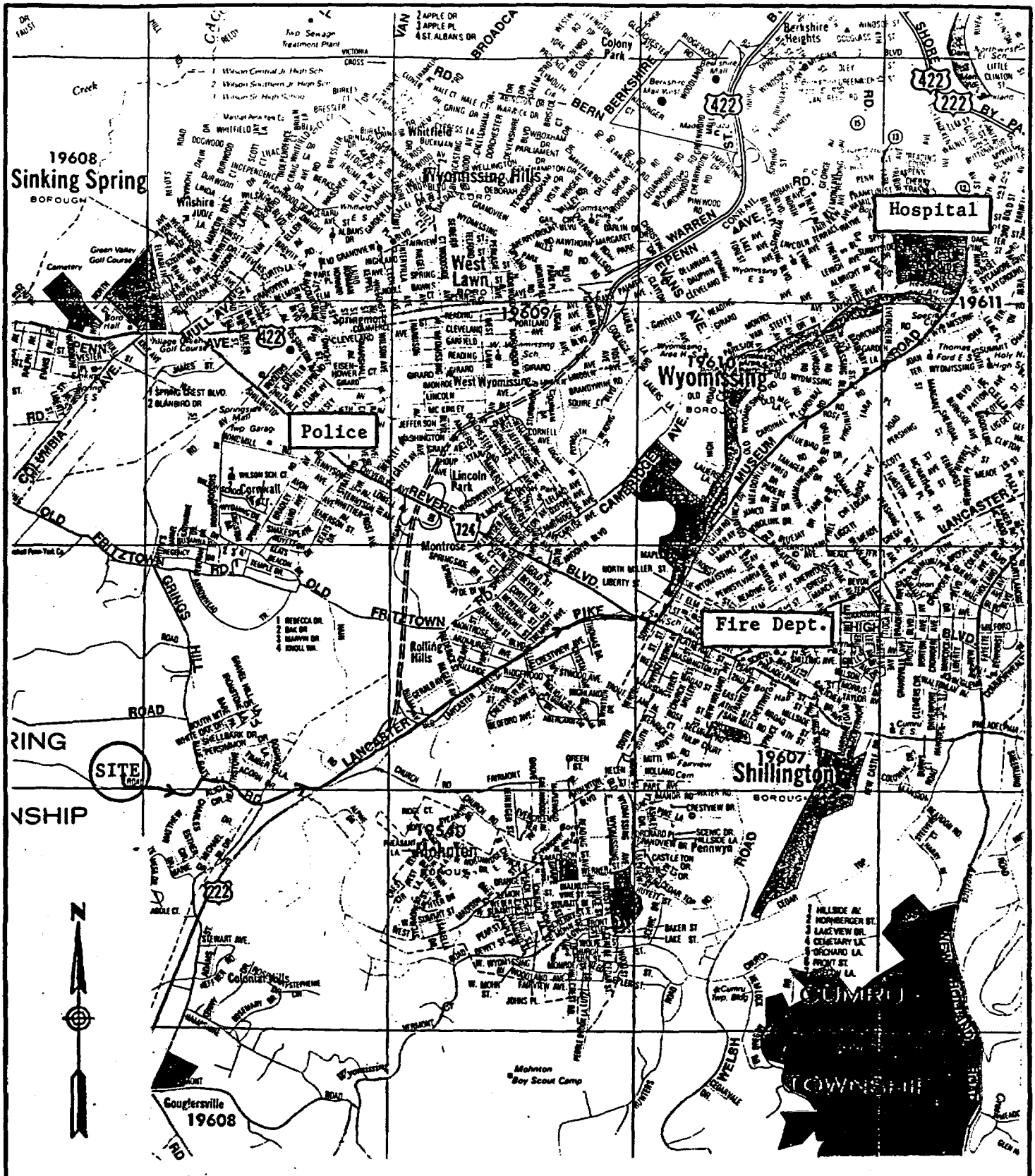
All project personnel advised of location of designated medical facility or facilities? YES ___

_____

Printed Name of Field Team Leader or Site Safety Officer

_____

Signature Date



Directions to Hospital: Wheatfield Rd. to Griggs Hill Rd. to Rt. 222 North (Lancaster Pike). Take Rt. 222 North to Museum Rd. (near intersection with Rt. 724. Take Museum Rd. north to Hospital.

MAY 1 1 1992

JOB No.: 913-6389	SCALE: N/A	ROUTE TO HOSPITAL	
DRAWN: EAM	DATE: 08/06/91		
CHECKED: RSW	DWG. No.: PA21-088		
Golder Associates	BERKS LANDFILL	FIGURE H1	

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