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RCRA ANNUAL REPORT
MARCH 1, 1990
VOLUME II OF III

03/01/90

REPORT

[redacted]

FEED MATERIALS PRODUCTION CENTER

RCRA ANNUAL REPORT FOR 1989

MARCH 1, 1990

VOLUME II of III

FEED MATERIALS PRODUCTION CENTER

RCRA ANNUAL REPORT FOR 1989

MARCH 1, 1990

VOLUME II of III

FMPC RCRA ANNUAL REPORT FOR CALENDAR YEAR 1989

APPENDIX IV

August 1989 Sampling Round Laboratory

Analysis Data Sheets

Cross Reference of Well Identification to Sample Identification
August, 1989
RCRA Assessment Sampling

Sample Number	Location
66490	1027
66492	TRIP
66495	1038
66496	1081
66497	1024
66498	2066
66499	3066
66500	3001
66501	4001
66502	2021
66503	2010
66504	3010
66505	4010
66506	2013
66507	3013
66508	4013
66509	2051
66510	3051
66511	2055
66512	3055
66513	3008
66514	4008
66515	3024
66516	1083
66517	3010
66518	TRIP
66519	TRIP
66520	TRIP
66521	TRIP
66522	TRIP
66523	4008
66524	TRIP
66525	3001
66526	RINS
66527	TRIP
66528	RINS
66529	TRIP
66532	1052
66534	1079
66535	1080
66537	2019
66538	3019
66540	2037
66541	3037
66542	2043
66543	3043
66544	2084
66545	3084

Cross Reference of Well Identification
to Sample Identification
August, 1989
RCRA Assessment Sampling

Sample Number	Location
66547	2043
66548	RINS
66550	TRIP
66551	TRIP
66552	TRIP
66553	TRIP
66554	TRIP
66555	TRIP
66556	1025
66557	1031
66558	1074
66559	1082
66562	1052
66564	1079
66565	1080
66567	2019
66568	3019
66570	2037
66571	3037
66572	2043
66573	3043
66574	2084
66575	3084
66577	2043
66578	RINS
66580	2027
66581	2027
66582	2084
66583	3084
66584	1080
66585	2043
66586	3043
66587	2043
66588	2084
66589	3084
66595	1025
66596	1031
66597	1074
66598	1082
66599	2027
66600	2027

IT Corporation
October 27, 1989

Client Project ID: Fernald RI/FS

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNT 44220
(ITNT 35606)

TABLE 1

SAMPLE SUMMARY TABLE

Field #	ITAS # (ITMWL #)	Matrix	Analysis
66562	MM0015	Water	BNA
66596	MM0016	Water	BNA
66596 RE	MM0016	Water	RE-BNA
66597	MM0017	Water	BNA
SBLK1	Q1449	Water	MB-BNA
SBLK2	Q1469	Water	MB-BNA

Abbreviations: BNA = Semivolatiles
RE = Reprepped/reanalyzed
MB = Method Blank

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

• - Values outside of contract required QC limits.

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: QXM12B909141

Sample Date: N/A
IT Sample ID: QX1449
Prep Date: 09/14/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	10	U
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences. Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: QXM12B909141

Sample Date: N/A
IT Sample ID: QX1449
Prep Date: 09/14/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66562

Sample Date: N/A
IT Sample ID: MM0015
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	2	J	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	2	J
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66562

Sample Date: N/A
IT Sample ID: MM0015
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66596

Sample Date: N/A
IT Sample ID: MM0016
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	11	J
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	6	J
4-Methylphenol	10	U	N-Nitrosodiphenylamine	3	J
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	3	J
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	12		Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	2	J	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66596

Sample Date: N/A
IT Sample ID: MM0016
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	4	J	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	4	J			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences. Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE. TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66597

Sample Date: N/A
IT Sample ID: MM0017
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	2	J
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66597

Sample Date: N/A
IT Sample ID: MM0017
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: QXM12B910041

Sample Date: N/A
IT Sample ID: QX1469
Prep Date: 10/04/89
Analysis Date: (Completed) 10/05/89
Blank Sample ID: QXM12B910041
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	4	J
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: QXM12B910041

Sample Date: N/A
IT Sample ID: QX1469
Prep Date: 10/04/89
Analysis Date: (Completed) 10/05/89
Blank Sample ID: QXM12B910041
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	2	J			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66596R

Sample Date: N/A
IT Sample ID: MM0016R
Prep Date: 10/04/89
Analysis Date: (Completed) 10/05/89
Blank Sample ID: QXM12B910041
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	4	J
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	5	J
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35605

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66596R

Sample Date: N/A
IT Sample ID: MM0016R
Prep Date: 10/04/89
Analysis Date: (Completed) 10/05/89
Blank Sample ID: QXM12B910041
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	3	J	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	8	J			
5-Nitro-o-toluidine	20	U			
Diphenylamine	2	J			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Attn: Heather Bond
C/O ASI Inc.
10845 Hamilton Cleves Road
Ross, OH 45061

Date: October 27, 1989

Page: 1 of 4

Job Number: ITNT 35609

P.O Number: Accounts Payable

This is the Certificate of Analysis for the following:

Client Project ID:	FMPC RI/FS	66592	66580
Date Received by Lab:	09/12/89	66599	66581
Number of Samples:	Three (3)	66600	
Sample Type:	Groundwater	66559	

I. INTRODUCTION

On September 12, 1989, three (3) groundwater samples were received at ITAS-Oak Ridge Lab from Advanced Sciences Inc., Ross, Ohio. The list of analytical tests performed, as well as date of receipt and analysis can be found in the attached report.

Blanks are identified with client sample ID's starting with either "QX..B" or "QX...B.". Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. ANALYTICAL RESULTS/METHODOLOGY

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits. Metal analyses were performed by Inductively Coupled Plasma (ICP) Spectrometry, except for lead which was analyzed by Graphite Furnace Atomic Absorption Spectroscopy.

The samples were analyzed for TCL volatile compounds using the EPA CLP 10/86 Statement of Work.

Reviewed and Approved -

Snell A. Mills

Snell A. Mills, III
Laboratory Manager

SAM/rdj

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

III. QUALITY CONTROL

The volatile analyses were performed on 09/20/89 - 09/21/89. The sample runs proceeded well. The MS/MSD analyses were performed on sample 66600, Project ITNT 35609. All QC results were within QC limits.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected.
B - Compound was found int he method blank.
J - Compound detected but below the contract required quantitation limit. The value given was an estimate.

IT ANALYTICAL SERVICES
OAK RIDGE, TN

Advanced Sciences, Inc.
Date: October 27, 1989
Client Project ID: RI/FS Fernald

Job Number: ITNT 35609

SAMPLE SUMMARY TABLE

Field #	ITAS #	Matrix	Conc.	Analysis
66598	MM0080	WATER	LOW	VOA
	MM0105	WATER	LOW	METALS
66599	MM0081	WATER	LOW	VOA
	MM0106	WATER	LOW	METALS
66600	MM0082	WATER	LOW	VOA
	MM0107	WATER	LOW	METALS
66600MS	MM0083	WATER	LOW	QC/MS/VOA
	MM0108	WATER	LOW	QC/MS/METALS
66600MSD	MM0084	WATER	LOW	QC/MSD/VOA
66600DUP	MM0109	WATER	LOW	QC/DUP/METALS
66559	MM0072	WATER	LOW	CHLORIDE
	MM0072	WATER	LOW	FLUORIDE
	MM0067	WATER	LOW	NITRATE
	MM0072	WATER	LOW	SULFATE
	MM0075	WATER	LOW	TOC
	MM0075	WATER	LOW	TOX
66580	MM0073	WATER	LOW	CHLORIDE
	MM0073	WATER	LOW	FLUORIDE
	MM0068	WATER	LOW	NITRATE
	MM0073	WATER	LOW	SULFATE
	MM0076	WATER	LOW	TOC
	MM0076	WATER	LOW	TOX
66581	MM0074	WATER	LOW	CHLORIDE
	MM0074	WATER	LOW	FLUORIDE
	MM0069	WATER	LOW	NITRATE
	MM0074	WATER	LOW	SULFATE
	MM0077	WATER	LOW	TOC
	MM0077	WATER	LOW	TOX
66581MS	MM0070	WATER	LOW	QC/MS/NITRATE
	MM0078	WATER	LOW	QC/MS/TOC
	MM0078	WATER	LOW	QC/MS/TOX
66581MSD	MM0071	WATER	LOW	QC/MSD/NITRATE
	MM0079	WATER	LOW	QC/MSD/TOC
	MM0079	WATER	LOW	QC/MSD/TOX

Abbreviations:
VOA - volatiles
MS - Matrix Spike
MSD - Matrix Spike Duplicate
TOC - Total Organic Carbon
TOX - Total Organic Halides

IT ANALYTICAL SERVICES
OAK RIDGE, TN

Advanced Sciences, Inc.
Date: October 27, 1989
Client Project ID: RI/FS Fernald

Page: 4 of 4
Job Number: ITNT 35609

T O C

Field #	Sample #	Range
66559	MM0075	1.98 - 2.96
66580	MM0076	2.88 - 3.80
66581	MM0077	1.86 - 2.18
	BLANK	0.059 - 0.311

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

• - Values outside of contract required QC limits.

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

EPA CLP TCL Volatile Organics by GCMS - Current EPA CLP Protocol - MV 702

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: JJ5969
Prep Date:
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXM09B909213
Concentration Units: UG/LITER

Parameter	Result	
Methylene chloride	5	U
Acetone	10	U
1,1-Dichloroethane	5	U
Trichloroethene	5	U
Tetrachlorethene	5	U
Toluene	5	U

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: JJ5970
Prep Date:
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXM09B909213
Concentration Units: UG/LITER

Parameter	Result	
Methylene chloride	5	U
Acetone	10	U
1,1-Dichloroethane	5	U
Trichloroethene	5	U
Tetrachlorethene	5	U
Toluene	5	U

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

EPA CLP TCL Volatile Organics by GCMS - Current EPA CLP Protocol - MV 702

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: JJ5971
Prep Date:
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXM09B909202
Concentration Units: UG/LITER

Parameter	Result	
Methylene chloride	5	U
Acetone	10	U
1,1-Dichloroethane	5	U
Trichloroethene	5	U
Tetrachlorethene	5	U
Toluene	5	U

Client Sample ID: 66600MS

Sample Date: N/A
IT Sample ID: JJ5971MS
Prep Date:
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXM09B909202
Concentration Units: % RECOVERY

Parameter	Result
1,1-Dichloroethene	111
Trichloroethene	99
Benzene	89
Toluene	90
Chlorobenzene	108

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

EPA CLP TCL Volatile Organics by GCMS - Current EPA CLP Protocol - MV 702

Client Sample ID: 66600MSD

Sample Date: N/A
IT Sample ID: JJ5971MSD
Prep Date:
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXM09B909202
Concentration Units: % RECOVERY

Parameter	Result
1,1-Dichloroethene	109
Trichloroethene	99
Benzene	91
Toluene	89
Chlorobenzene	108

Client Sample ID: QXM09B909202

Sample Date: N/A
IT Sample ID: XVB0920B
Prep Date:
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXM09B909202
Concentration Units: UG/LITER

Parameter	Result	
Methylene chloride	2	J
Acetone	10	U
1,1-Dichloroethane	5	U
Trichloroethene	5	U
Tetrachlorethene	5	U
Toluene	5	U

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

EPA CLP TCL Volatile Organics by GCMS - Current EPA CLP Protocol - MV 702

Client Sample ID: QXM09B909213

Sample Date: N/A
IT Sample ID: XVB0921C
Prep Date:
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXM09B909213
Concentration Units: UG/LITER

Parameter	Result	
Methylene chloride	2	J
Acetone	10	U
1,1-Dichloroethane	5	U
Trichloroethene	5	U
Tetrachlorethene	5	U
Toluene	5	U

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Metals by ICP - EPA 200.7 - AP 701

Client Sample ID: QXA16B909262

Sample Date: N/A
IT Sample ID: 16B909262
Prep Date: 09/26/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXA16B909262
Concentration Units: MG/LITER

Parameter	Result
Silver	.01 U
Aluminum	.06 U
Barium	.002 U
Beryllium	.001 U
Calcium	.02 U
Cobalt	.01 U
Chromium	.01 U
Copper	.01 U
Iron	.01 U
Magnesium	.06 U
Nickel	.02 U
Vanadium	.01 U
Zinc	.002 U

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Metals by ICP - EPA 200.7 - AP 701

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0105
Prep Date: 09/26/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXA16B909262
Concentration Units: MG/LITER

Parameter	Result	
Silver	.015	
Aluminum	.208	
Barium	.102	
Beryllium	.002	
Calcium	176	
Cobalt	.01	U
Chromium	.037	
Copper	.01	U
Iron	.102	
Magnesium	79.1	
Nickel	.027	
Vanadium	.03	
Zinc	.021	

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Metals by ICP - EPA 200.7 - AP 701

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0106
Prep Date: 09/26/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXA16B909262
Concentration Units: MG/LITER

Parameter	Result
Silver	.01 U
Aluminum	.275
Barium	.054
Beryllium	.002
Calcium	449
Cobalt	.013
Chromium	.038
Copper	.01 U
Iron	3.27
Magnesium	72.2
Nickel	.037
Vanadium	.044
Zinc	.026

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Metals by ICP - EPA 200.7 - AP 701

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0107
Prep Date: 09/26/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXA16B909262
Concentration Units: MG/LITER

Parameter	Result
Silver	.01 U
Aluminum	.287
Barium	.066
Beryllium	.002
Calcium	519
Cobalt	.014
Chromium	.036
Copper	.01 U
Iron	9.61
Magnesium	81.9
Nickel	.037
Vanadium	.048
Zinc	.108

Client Sample ID: 66600D1

Sample Date: N/A
IT Sample ID: MM0107D1
Prep Date: 09/26/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXA16B909262
Concentration Units: MG/LITER

Parameter	Result
Calcium	526
Magnesium	84.4

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Metals by ICP - EPA 200.7 - AP 701

Client Sample ID: 66600D2

Sample Date: N/A
IT Sample ID: MM0107D2
Prep Date: 09/26/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXA16B909262
Concentration Units: MG/LITER

Parameter	Result
Calcium	542
Magnesium	86.4

Client Sample ID: 66600MS

Sample Date: N/A
IT Sample ID: MM0107MS
Prep Date: 09/26/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXA16B909262
Concentration Units: % RECOVERY

Parameter	Result
Silver	85.8
Aluminum	120
Barium	97.5
Beryllium	96.4
Cobalt	92
Chromium	92.2
Copper	94.8
Iron	97.9
Nickel	91.9
Vanadium	94.5
Zinc	93.1

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Metals by ICP - EPA 200.7 - AP 701

Client Sample ID: 66600MSD

Sample Date: N/A
IT Sample ID: MM0107MSD
Prep Date: 09/26/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXA16B909262
Concentration Units: % RECOVERY

Parameter	Result
Silver	83
Aluminum	500
Barium	96.6
Beryllium	95.6
Cobalt	90
Chromium	91.4
Copper	93
Iron	126
Nickel	90.4
Vanadium	93.7
Zinc	94.9

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Lead by Furnace AA - EPA SW846 3020 & 7421 - AG 019

Client Sample ID: QXA17B909262

Sample Date: N/A
IT Sample ID: 17B909262
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA17B909262
Concentration Units: MG/LITER

Parameter	Result
Lead	.002 U

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0105
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA17B909262
Concentration Units: MG/LITER

Parameter	Result
Lead	.002 U

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0106
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA17B909262
Concentration Units: MG/LITER

Parameter	Result
Lead	.002 U

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Lead by Furnace AA - EPA SW846 3020 & 7421 - AG 019

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0107
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA17B909262
Concentration Units: MG/LITER

Parameter	Result
Lead	.006

Client Sample ID: 66600MS

Sample Date: N/A
IT Sample ID: MM0107MS
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA17B909262
Concentration Units: % RECOVERY

Parameter	Result
Lead	89

Client Sample ID: 66600MSD

Sample Date: N/A
IT Sample ID: MM0107MSD
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA17B909262
Concentration Units: % RECOVERY

Parameter	Result
Lead	90.8

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Chloride by Ion Specific Electrode - EPA 325.3 - WW 017

Client Sample ID: QXW17B909214

Sample Date: N/A
IT Sample ID: 17B909214
Prep Date: 09/21/89
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXW17B909214
Concentration Units: MG/LITER

Parameter	Result
Chloride	.5 U

Client Sample ID: 66559

Sample Date: N/A
IT Sample ID: MM0072
Prep Date: 09/21/89
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXW17B909214
Concentration Units: MG/LITER

Parameter	Result
Chloride	49

Client Sample ID: 66580

Sample Date: N/A
IT Sample ID: MM0073
Prep Date: 09/21/89
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXW17B909214
Concentration Units: MG/LITER

Parameter	Result
Chloride	77

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Chloride by Ion Specific Electrode - EPA 325.3 - WW 017

Client Sample ID: 66581

Sample Date: N/A
IT Sample ID: MM0074
Prep Date: 09/21/89
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXW17B909214
Concentration Units: MG/LITER

Parameter	Result
Chloride	114

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Flouride by Ion Specific Electrode - EPA 340.2 - WW 042

Client Sample ID: QXW42B910091

Sample Date: N/A
IT Sample ID: 42B910091
Prep Date: 10/09/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXW42B910091
Concentration Units: MG/LITER

Parameter	Result
Fluoride	.05 U

Client Sample ID: 66559

Sample Date: N/A
IT Sample ID: MM0072
Prep Date: 10/09/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXW42B910091
Concentration Units: MG/LITER

Parameter	Result
Fluoride	.58

Client Sample ID: 66580

Sample Date: N/A
IT Sample ID: MM0073
Prep Date: 10/09/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXW42B910091
Concentration Units: MG/LITER

Parameter	Result
Fluoride	.5

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Flouride by Ion Specific Electrode - EPA 340.2 - WW 042

Client Sample ID: 66581

Sample Date: N/A
IT Sample ID: MM0074
Prep Date: 10/09/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXW42B910091
Concentration Units: MG/LITER

Parameter	Result
Fluoride	.13

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Nitrate, as N - EPA 353.3 - WW 053

Client Sample ID: QXW53B909222

Sample Date: N/A
IT Sample ID: 53B909222
Prep Date: 09/22/89
Analysis Date: (Completed) 09/22/89
Blank Sample ID: QXW53B909222
Concentration Units: MG/LITER

Parameter	Result
Nitrate	.1 U

Client Sample ID: 66559

Sample Date: N/A
IT Sample ID: MMD067
Prep Date: 09/22/89
Analysis Date: (Completed) 09/22/89
Blank Sample ID: QXW53B909222
Concentration Units: MG/LITER

Parameter	Result
Nitrate	.132

Client Sample ID: 66580

Sample Date: N/A
IT Sample ID: MMD068
Prep Date: 09/22/89
Analysis Date: (Completed) 09/22/89
Blank Sample ID: QXW53B909222
Concentration Units: MG/LITER

Parameter	Result
Nitrate	.1 U

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Nitrate, as N - EPA 353.3 - WW 053

Client Sample ID: 66581

Sample Date: N/A
IT Sample ID: MM0069
Prep Date: 09/22/89
Analysis Date: (Completed) 09/22/89
Blank Sample ID: QXW53B909222
Concentration Units: MG/LITER

Parameter	Result
Nitrate	.1 U

Client Sample ID: 66581MS

Sample Date: N/A
IT Sample ID: MM0069MS
Prep Date: 09/22/89
Analysis Date: (Completed) 09/22/89
Blank Sample ID: QXW53B909222
Concentration Units: % RECOVERY

Parameter	Result
Nitrate	82.3

Client Sample ID: 66581MSD

Sample Date: N/A
IT Sample ID: MM0069MSD
Prep Date: 09/22/89
Analysis Date: (Completed) 09/22/89
Blank Sample ID: QXW53B909222
Concentration Units: % RECOVERY

Parameter	Result
Nitrate	81.3

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Total Organic Carbon - EPA 415.1 - OM 001

Client Sample ID: QX001B909181

Sample Date: N/A
IT Sample ID: 01B909181
Prep Date: 09/18/89
Analysis Date: (Completed) 09/18/89
Blank Sample ID: QX001B909181
Concentration Units: MG/LITER

Parameter	Result	
Total Organic Carbon	1	U

Client Sample ID: 66559

Sample Date: N/A
IT Sample ID: MM0075
Prep Date: 09/18/89
Analysis Date: (Completed) 09/18/89
Blank Sample ID: QX001B909181
Concentration Units: MG/LITER

Parameter	Result
Total Organic Carbon	2.49

Client Sample ID: 66580

Sample Date: N/A
IT Sample ID: MM0076
Prep Date: 09/18/89
Analysis Date: (Completed) 09/18/89
Blank Sample ID: QX001B909181
Concentration Units: MG/LITER

Parameter	Result
Total Organic Carbon	3.33

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Total Organic Carbon - EPA 415.1 - OM 001

Client Sample ID: 66581

Sample Date: N/A
IT Sample ID: MM0077
Prep Date: 09/18/89
Analysis Date: (Completed) 09/18/89
Blank Sample ID: QX001B909181
Concentration Units: MG/LITER

Parameter	Result
Total Organic Carbon	1.98

Client Sample ID: 66581MS

Sample Date: N/A
IT Sample ID: MM0077MS
Prep Date: 09/18/89
Analysis Date: (Completed) 09/18/89
Blank Sample ID: QX001B909181
Concentration Units: % RECOVERY

Parameter	Result
Total Organic Carbon	106

Client Sample ID: 66581MSD

Sample Date: N/A
IT Sample ID: MM0077MSD
Prep Date: 09/18/89
Analysis Date: (Completed) 09/18/89
Blank Sample ID: QX001B909181
Concentration Units: % RECOVERY

Parameter	Result
Total Organic Carbon	166

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Total Organic Halides - EPA 450.1/SW846 9020 - OM 004

Client Sample ID: QX004B909151

Sample Date: N/A
IT Sample ID: 04B909151
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QX004B909151
Concentration Units: MG/LITER

Parameter	Result
Total Organic Halides	.01 U

Client Sample ID: 66559

Sample Date: N/A
IT Sample ID: MMD075
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QX004B909151
Concentration Units: MG/LITER

Parameter	Result
Total Organic Halides	.021

Client Sample ID: 66580

Sample Date: N/A
IT Sample ID: MMD076
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QX004B909151
Concentration Units: MG/LITER

Parameter	Result
Total Organic Halides	.028

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Total Organic Halides - EPA 450.1/SW846 9020 - OM 004

Client Sample ID: 66581

Sample Date: N/A
IT Sample ID: MM0077
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QX004B909151
Concentration Units: MG/LITER

Parameter	Result
Total Organic Halides	.01 U

Client Sample ID: 66581MS

Sample Date: N/A
IT Sample ID: MM0077MS
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QX004B909151
Concentration Units: % RECOVERY

Parameter	Result
Total Organic Halides	105

Client Sample ID: 66581MSD

Sample Date: N/A
IT Sample ID: MM0077MSD
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QX004B909151
Concentration Units: % RECOVERY

Parameter	Result
Total Organic Halides	103

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Sulfate - EPA 375.4 - WW 081

Client Sample ID: QXW81B909145

Sample Date: N/A
IT Sample ID: 81B909145
Prep Date: 09/14/89
Analysis Date: (Completed) 09/14/89
Blank Sample ID: QXW81B909145
Concentration Units: MG/LITER

Parameter	Result	
Sulfate	2	U

Client Sample ID: QXW81B909155

Sample Date: N/A
IT Sample ID: 81B909155
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW81B909155
Concentration Units: MG/LITER

Parameter	Result	
Sulfate	2	U

Client Sample ID: 66559

Sample Date: N/A
IT Sample ID: M80072
Prep Date: 09/14/89
Analysis Date: (Completed) 09/14/89
Blank Sample ID: QXW81B909145
Concentration Units: MG/LITER

Parameter	Result
Sulfate	195

Advanced Sciences, Inc.
Date: 27-OCT-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Sulfate - EPA 375.4 - WW 081

Client Sample ID: 66580

Sample Date: N/A
IT Sample ID: MM0073
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW81B909155
Concentration Units: MG/LITER

Parameter	Result
Sulfate	726

Client Sample ID: 66581

Sample Date: N/A
IT Sample ID: MM0074
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW81B909155
Concentration Units: MG/LITER

Parameter	Result
Sulfate	1320

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Attn: Cindy Capannari
C/O ASI Inc.
10845 Hamilton Cleves Road
Ross, OH 45061

Date: November 15, 1989

Page 1 of 5

Job Number: ITNT 35609

P.O Number: Accounts Payable

This is the Certificate of Analysis for the following samples:

Client Project ID:	Fernald RI/FS	66598
Date Received by Lab:	09/12/89	66599
Number of Samples:	Three (3)	66600
Sample Type:	Water	

I. **INTRODUCTION**

On September 12, 1989, three (3) water samples were received at ITAS-Oak Ridge Lab from Advanced Sciences Inc., Ross, Ohio. The list of analytical tests performed, as well as date of receipt and analysis can be found in the attached report.

Blanks are identified with client sample ID's starting with either "QX..B" or "QX...B". Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. **ANALYTICAL RESULTS/METHODOLOGY**

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

The samples were analyzed for TCL and additional Appendix IX volatile organic compound by gas chromatography/mass spectroscopy in accordance with EPA CLP 2/88 Statement of Work. This analysis was performed at ITAS-Knoxville, Tennessee Laboratory, narrative submitted separately.

Reviewed and Approved

Snell A. Mills III

Snell A. Mills, III
Laboratory Manager

SAM/rdj

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories

The samples were analyzed for the TCL and additional Appendix IX semivolatiles organic compounds by gas chromatography/mass spectroscopy in accordance with the EPA CLP 2/88 Statement of Work. The samples were extracted at the IT-Mixed Waste Laboratory in Oak Ridge, Tennessee, and the analysis was performed at ITAS-Knoxville, Tennessee Laboratory, narrative submitted separately.

The samples were extracted and analyzed for TCL and additional Appendix IX pesticides/PCB compounds (Isochin and Kepone) by gas chromatography using the EPA CLP 10/86 Statement of Work.

The samples were extracted for Appendix IX herbicide compounds and analyzed by gas chromatography using EPA Method 8150 USEPA SW-846, 3rd Ed., 1986.

The samples were extracted and analyzed for TCL and additional Appendix IX inorganics using the EPA CLP 7/87 Statement of Work.

The samples were prepared and analyzed for Sulfide in accordance with EPA method 9030, SW-846, 3rd edition, 1986.

The samples were prepared and analyzed for fluoride in accordance with the method 4500-F-C Ion Selective Electrode Method, Standard Methods, 17th edition, 1989.

The samples were analyzed for both isomer specific 2,3,7,8-TCDD and total tetra through hexa (Cl_4 - Cl_6) dioxin and furan homologs using a modified version of EPA method 8280, revised September, 1986. The analysis was performed at ITAS-Knoxville, Tennessee, narrative submitted separately.

The samples were analyzed for Appendix IX compounds, at ITAS-San Jose Laboratory, San Jose, California, using EPA method 8140, USEPA SW-846, 3rd edition, 1986, narrative submitted separately.

III. QUALITY CONTROL

The pesticide and aroclor analyses were performed on 09/26/89 and 09/28/89. All samples and blanks were prepped as low-level waters. One (1) out of twelve (12) matrix spike duplicate recoveries were outside the QC required limit. All of the water pesticide surrogate recoveries were within the QC required limits,

The herbicide analysis was performed on 10/10/89, no confirmation run was needed. The MS/MSD analyses were performed on sample 66600, there are no limits set for herbicides.

Organic data was reported with qualifiers as follows:

U - Compound analyzed for but not detected.
E - Compound exceeded calibration range of instrument.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below the contract required quantitation limit. The value given was an estimate.
B - Compound was found in the method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer intentatively identified compounds.

The inorganic QC for these samples are referenced to ITNT 35609, sample number 66600, submitted separately.

The samples were prepared for ICP analysis on 09/26/89 and analyzed on 10/02/89 and 10/18/89. The zinc and barium serial dilutions did not meet QC requirements and is flagged with an "E".

Mercury analysis was prepared and analyzed by cold vapor analyses on 09/25/89. The matrix spike was outside the QC limits.

Potassium analysis was prepared on 09/26/89 and analyzed on 09/28/89 by flame AA.

The samples were prepared for GFAA analysis on 09/26/89. The samples were analyzed during the period 10/04/89 - 10/10/89. The analytical spike recovery for lead was outside 15% window. All Selenium samples were outside the 15% window for analytical spike recovery and the matrix spike was outside QC limits.

The samples were prepared on 09/13/89 for Cyanide analyses and analyzed on 09/15/89.

The samples were prepared and analyzed for Sulfide on 09/12/89.

The samples were prepared and analyzed for Fluoride on 10/09/89. The MS/MSD analyses were performed on sample 66532, (Job Number: ITNT 35605, to be submitted separately).

Inorganic data was reported with the following qualifiers:

N - Matrix Spike outside QC limits.
* - Duplicate values outside QC limits.
E - Furnace anal. spike 40%; ICP serial dilution outside QC limits.
W - Furnace anal. spike recovery outside + or - 15% window.
S - Method of standard used (MSA).
+ - Correlation coefficient for MSA <0.995.

Advanced Sciences, Inc.
Date: November 15, 1989
Client Project ID: RI/FS Fernald

IT ANALYTICAL SERVICES
OAK RIDGE, TN

Job Number: ITNT 35609

SAMPLE SUMMARY TABLE

Field #	ITAS #	Matrix	Conc.	Analysis
66598	MM0080	WATER	LOW	VOA
	MM0085	WATER	LOW	BNA
	MM0090	WATER	LOW	SULFIDE
	MM0095	WATER	LOW	PEST/PCB/HERBICIDE
	MM0100	WATER	LOW	OP PEST
	MM0105	WATER	LOW	METALS
	MM0110	WATER	LOW	CYANIDE
	MM0115	WATER	LOW	DIOXIN/FURAN
66599	MM0081	WATER	LOW	VOA
	MM0086	WATER	LOW	BNA
	MM0091	WATER	LOW	SULFIDE
	MM0096	WATER	LOW	PEST/PCB/HERBICIDE
	MM0101	WATER	LOW	OP PEST
	MM0106	WATER	LOW	METALS
	MM0111	WATER	LOW	CYANIDE
	MM0116	WATER	LOW	DIOXIN/FURANS
66600	MM0082	WATER	LOW	VOA
	MM0087	WATER	LOW	BNA
	MM0092	WATER	LOW	SULFIDE
	MM0097	WATER	LOW	PEST/PCB/HERB
	MM0102	WATER	LOW	OP PEST
	MM0107	WATER	LOW	METALS
	MM0112	WATER	LOW	CYANIDE
	MM0117	WATER	LOW	DIOXIN/FURAN
66600D	MM0108	WATER	LOW	QC/DUP/METALS
66600MS	MM0083	WATER	LOW	QC/MS/VOA
	MM0088	WATER	LOW	QC/MS/BNA
	MM0093	WATER	LOW	QC/MS/SULFIDE
	MM0098	WATER	LOW	QC/MS/PEST/PCB/HERB
	MM0103	WATER	LOW	QC/MS/OP PEST
	MM0109	WATER	LOW	QC/MS/METALS
	MM0113	WATER	LOW	QC/MS/CYANIDE
	MM0118	WATER	LOW	QC/MS/DIOXIN/FURAN
66600MSD	MM0084	WATER	LOW	QC/MSD/VOA
	MM0089	WATER	LOW	QC/MSD/BNA
	MM0094	WATER	LOW	QC/MSD/SULFIDE
	MM0099	WATER	LOW	QC/MSD/PEST/PCB/HERB
	MM0104	WATER	LOW	QC/MSD/OP PEST
	MM0109	WATER	LOW	QC/MSD/CYANIDE
	MM0119	WATER	LOW	QC/MSD/DIOXIN/FURAN

SAMPLE SUMMARY TABLE
(Continued)

Field #	ITAS #	Matrix	Conc.	Analysis
66559	MM0072	WATER	LOW	FLUORIDE
66580	MM0073	WATER	LOW	FLUORIDE
66581	MM0074	WATER	LOW	FLUORIDE

ABBREVIATIONS:
- VOA - Volatile Organic Analysis
- BNA - Base-Neutral Acid Extractions
- Pest - Pesticide
- OP - Organo Phosphorus
- MS - Matrix Spike
- MSD - Matrix Spike Duplicate
- HERB - Herbicides
- DUP - Duplicate

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

• - Values outside of contract required QC limits.

Table EDT-5

EPA CLP INORGANIC QUALIFIERS

U - Indicates compound was analyzed for but not detected.

B - The reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL).

E - The reported value is estimated because of the presence of interference.

M - Duplicate injection precision not met.

N - Spiked sample recovery not within control limits.

S - The reported value was determined by the Method of Standard Additions.

W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

G - Native analyte > 4 times spike added, therefore acceptance criteria do not apply.

X - Detection limit is higher than normal due to sample matrix interferences.

• - Duplicate analysis not within control limits.

+ - Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT[illegible]

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC,781

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0095
Prep Date: 09/14/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909141
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4,4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4,4'-DDD	.1	U
Endosulfan sulfate	.1	U
4,4'-DDT	.1	U
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	.1	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0096
Prep Date: 09/14/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909141
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4,4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4,4'-DDD	.1	U
Endosulfan sulfate	.1	U
4,4'-DDT	.1	U
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	1	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE TN

Client Project ID: Fernald RI/FS

Job Number [illegible]

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0097
Prep Date: 09/14/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909141
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4.4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4.4'-DDD	.1	U
Endosulfan sulfate	.1	U
4.4'-DDT	.1	U
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	.1	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT3560[illegible]

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC [illegible]

Client Sample ID: 66600DL

Sample Date: N/A
IT Sample ID: MM0097-3
Prep Date: 09/14/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909141
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.15	U
beta-BHC	.15	U
delta-BHC	.15	U
gamma-BHC (Lindane)	.15	U
Heptachlor	.15	U
Aldrin	.15	U
Heptachlor epoxide	.15	U
Endosulfan-I	.15	U
Dieldrin	.3	U
4,4'-DDE	.3	U
Endrin	.3	U
Endosulfan II	.3	U
4,4'-DDD	.3	U
Endosulfan sulfate	.3	U
4,4'-DDT	.3	U
Methoxychlor	1.5	U
Endrin ketone	.3	U
alpha-Chlordane	1.5	U
gamma-Chlordane	1.5	U
Toxaphene	3	U
Aroclor-1016	1.5	U
Aroclor-1221	1.5	U
Aroclor-1232	1.5	U
Aroclor-1242	1.5	U
Aroclor-1248	1.5	U
Aroclor-1254	3	U
Aroclor-1260	3	U
Isodrin	.15	U
Kepone	.3	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT[illegible]

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66600DLMS

Sample Date: N/A
IT Sample ID: MM00983MS
Prep Date: 09/14/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909141
Concentration Units: % RECOVERY

Parameter	Result
gamma-BHC (Lindane)	96
Heptachlor	58
Aldrin	57
Dieldrin	70
Endrin	119
4,4'-DDT	83

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66600DLMSD

Sample Date: N/A
IT Sample ID: M00993MSD
Prep Date: 09/14/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909141
Concentration Units: % RECOVERY

Parameter	Result
gamma-BHC (Lindane)	84
Heptachlor	55
Aldrin	54
Dieldrin	62
Endrin	129 *
4,4'-DDT	64

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

RCRA/Appendix IX/Water Supply Herbicides - SM 509B/EPA SW846-8150 - GC 754

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0095
Prep Date: 09/13/89
Analysis Date: (Completed) 10/11/89
Blank Sample ID: QXG10B909131
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.05	U
Propanoic acid, 2-(2,4,5-tri	.025	U
2,4,5-Trichlorophenoxyacetic	5	U

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0096
Prep Date: 09/13/89
Analysis Date: (Completed) 10/11/89
Blank Sample ID: QXG10B909131
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.05	U
Propanoic acid, 2-(2,4,5-tri	.025	U
2,4,5-Trichlorophenoxyacetic	5	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT15609

RCRA/Appendix IX/Water Supply Herbicides - SM 509B/EPA SW846-8150 - GC 754

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0097
Prep Date: 09/13/89
Analysis Date: (Completed) 10/11/89
Blank Sample ID: QXG10B909131
Concentration Units: UG/LITER

Parameter	Result
2,4-Dichlorophenoxyacetic ac	.05 U
Propanoic acid, 2-(2,4,5-tri	.025 U
2,4,5-Trichlorophenoxyacetic	5 U

Client Sample ID: 66600MS

Sample Date: N/A
IT Sample ID: MM0098MS
Prep Date: 09/13/89
Analysis Date: (Completed) 10/11/89
Blank Sample ID: QXG10B909131
Concentration Units: % RECOVERY

Parameter	Result
2,4-Dichlorophenoxyacetic ac	968
Propanoic acid, 2-(2,4,5-tri	214

Client Sample ID: 66600MSD

Sample Date: N/A
IT Sample ID: MM0099MSD
Prep Date: 09/13/89
Analysis Date: (Completed) 10/11/89
Blank Sample ID: QXG10B909131
Concentration Units: % RECOVERY

Parameter	Result
2,4-Dichlorophenoxyacetic ac	323
Propanoic acid, 2-(2,4,5-tri	154

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: [illegible]

Appendix IX Metals by ICP - Modified Current EPA CLP Protocol - AP 714

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0105
Prep Date: 09/26/89
Analysis Date: (Completed) 10/18/89
Blank Sample ID: QXA14B909261
Concentration Units: UG/LITER

Parameter	Result	
Aluminum	208	
Antimony	30	U
Barium	102	BE
Beryllium	1.5	B
Cadmium	10.5	
Calcium	176000	
Chromium	37.4	
Cobalt	10	U
Copper	10	U
Iron	102	
Magnesium	79100	
Manganese	13.3	B
Nickel	27.4	B
Silver	14.9	
Sodium	18700	
Vanadium	30.3	B
Zinc	21.4	E
Osmium	50	U
Tin	30	U

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT3560

Appendix IX Metals by ICP - Modified Current EPA CLP Protocol - AP 714

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0106
Prep Date: 09/26/89
Analysis Date: (Completed) 10/18/89
Blank Sample ID: QXA14B909261
Concentration Units: UG/LITER

Parameter	Result	
Aluminum	275	
Antimony	30	U
Barium	53.7	BE
Beryllium	2.4	B
Cadmium	10.3	
Calcium	449000	
Chromium	37.7	
Cobalt	12.8	B
Copper	10	U
Iron	3270	
Magnesium	72200	
Manganese	1940	
Nickel	37.1	B
Silver	10	U
Sodium	33400	
Vanadium	43.8	B
Zinc	26	E
Osmium	50	U
Tin	30	U

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Metals by ICP - Modified Current EPA CLP Protocol - AP 714

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0107
Prep Date: 09/26/89
Analysis Date: (Completed) 10/18/89
Blank Sample ID: QXA14B909261
Concentration Units: UG/LITER

Parameter	Result	
Aluminum	287	
Antimony	30	U
Barium	65.5	BE
Beryllium	2.4	B
Cadmium	19.3	
Calcium	519000	
Chromium	35.9	
Cobalt	13.8	B
Copper	10	U
Iron	9610	
Magnesium	81900	
Manganese	1580	
Nickel	37.3	B
Silver	10	U
Sodium	35100	
Vanadium	47.9	B
Zinc	108	E
Osmium	50	U
Tin	30	U

Client Sample ID: 66600S2

Sample Date: N/A
IT Sample ID: MM0107S2
Prep Date: 09/26/89
Analysis Date: (Completed) 10/18/89
Blank Sample ID: QXA14B909261
Concentration Units: % RECOVERY

Advanced Sciences. Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Metals by ICP - Modified Current EPA CLP Protocol - AP 714

Client Sample ID: 66600D

Sample Date: N/A
IT Sample ID: MM0108D
Prep Date: 09/26/89
Analysis Date: (Completed) 10/18/89
Blank Sample ID: QXA14B909261
Concentration Units: UG/LITER

Parameter	Result	
Aluminum	287.9	
Antimony	30	U
Barium	65.5	B
Beryllium	2.4	B
Cadmium	19.1	
Calcium	520000	
Chromium	36.2	
Cobalt	13.1	B
Copper	10	U
Iron	9602	
Magnesium	82000	
Manganese	1586	
Nickel	37.9	B
Silver	10	U
Sodium	35100	
Vanadium	47.6	B
Zinc	107.2	
Osmium	50	U
Tin	30	U

Advanced Sciences. Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35669

Appendix IX Metals by ICP - Modified Current EPA CLP Protocol - AP 714

Client Sample ID: 66600S1

Sample Date: N/A
IT Sample ID: MM0109S1
Prep Date: 09/26/89
Analysis Date: (Completed) 10/18/89
Blank Sample ID: QXA14B909261
Concentration Units: % RECOVERY

Parameter	Result	
Aluminum	120.2	
Antimony	106.1	
Barium	97.5	
Beryllium	96.4	
Cadmium	95.2	
Chromium	92.2	
Cobalt	92	
Copper	94.8	
Iron	97.9	
Manganese	94.8	
Nickel	91.9	
Silver	85.8	
Vanadium	94.5	
Zinc	93.1	
Osmium	0	N
Tin	70.7	N

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number [illegible]

Metals by Furnace AA - Current EPA CLP Protocol - AG 702

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0105
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA12B909261
Concentration Units: UG/LITER

Parameter	Result	
Arsenic	2	U
Lead	2	UW
Selenium	2	UWN
Thallium	1	U

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0106
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA12B909261
Concentration Units: UG/LITER

Parameter	Result	
Arsenic	2	U
Lead	2	UW
Selenium	2	UWN
Thallium	1	U

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Mercury by Cold Vapor AA - Current EPA CLP Protocol - AV 002

Client Sample ID: QXA00B909252

Sample Date: N/A
IT Sample ID: 00B909252
Prep Date: 09/25/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QXA00B909252
Concentration Units: UG/LITER

Parameter	Result	
Mercury	.2	U

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0105
Prep Date: 09/25/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QXA00B909252
Concentration Units: UG/LITER

Parameter	Result	
Mercury	.2	UN

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0106
Prep Date: 09/25/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QXA00B909252
Concentration Units: UG/LITER

Parameter	Result	
Mercury	.2	UN

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Metals by Furnace AA - Current EPA CLP Protocol - AG 702

Client Sample ID: 66600D

Sample Date: N/A
IT Sample ID: MM0108D
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA12B909261
Concentration Units: UG/LITER

Parameter	Result	
Arsenic	2	U
Lead	5.7	
Selenium	2	U
Thallium	1	U

Client Sample ID: 66600S1

Sample Date: N/A
IT Sample ID: MM0109S1
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA12B909261
Concentration Units: % RECOVERY

Parameter	Result	
Arsenic	82.8	
Lead	89	
Selenium	67	N
Thallium	85.6	

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Metals by Furnace AA - Current EPA CLP Protocol - AG 702

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0107
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA12B909261
Concentration Units: UG/LITER

Parameter	Result	
[illegible]	2	U
Lead	5.7	
Selenium	2	UWN
Thallium	1	U

Client Sample ID: 66600S2

Sample Date: N/A
IT Sample ID: MM0107S2
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA12B909261
Concentration Units: % RECOVERY

Parameter	Result
Selenium	57

Advanced Sciences. Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: [illegible]

Mercury by Cold Vapor AA - Current EPA CLP Protocol - AV 002

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0107
Prep Date: 09/25/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QXA00B909252
Concentration Units: UG/LITER

Parameter	Result	
Mercury	.2	UN

Client Sample ID: 66600D

Sample Date: N/A
IT Sample ID: MM0108D
Prep Date: 09/25/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QXA00B909252
Concentration Units: UG/LITER

Parameter	Result	
Mercury	.2	U

Client Sample ID: 66600S1

Sample Date: N/A
IT Sample ID: MM0109S1
Prep Date: 09/25/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QXA00B909252
Concentration Units: % RECOVERY

Parameter	Result	
Mercury	130	N

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number [illegible]

Potassium by Flame AA - Current EPA CLP Protocol - AA 069

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0105
Prep Date: 09/26/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXA14B909261
Concentration Units: UG/LITER

Parameter	Result	
Potassium	1770	B

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0106
Prep Date: 09/26/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXA14B909261
Concentration Units: UG/LITER

Parameter	Result	
Potassium	4200	B

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0107
Prep Date: 09/26/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXA14B909261
Concentration Units: UG/LITER

Parameter	Result
Potassium	5530

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Potassium by Flame AA - Current EPA CLP Protocol - AA 069

Client Sample ID: 66600D

Sample Date: N/A
IT Sample ID: MM0108D
Prep Date: 09/26/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXA14B909261
Concentration Units: UG/LITER

Parameter	Result
Potassium	5329

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35[illegible]

Total Cyanide - Current EPA CLP Protocol - WW 034

Client Sample ID: QXW34B909131

Sample Date: N/A
IT Sample ID: 34B909131
Prep Date: 09/13/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW34B909131
Concentration Units: UG/LITER

Parameter	Result	
Cyanide	5	U

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0105
Prep Date: 09/13/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW34B909131
Concentration Units: UG/LITER

Parameter	Result	
Cyanide	5	U

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0106
Prep Date: 09/13/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW34B909131
Concentration Units: UG/LITER

Parameter	Result	
Cyanide	5	U

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT00609

Total Cyanide - Current EPA CLP Protocol - WW 034

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0107
Prep Date: 09/13/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW34B909131
Concentration Units: UG/LITER

Parameter	Result	
Cyanide	5	U

Client Sample ID: 66600D

Sample Date: N/A
IT Sample ID: MM0108D
Prep Date: 09/13/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW34B909131
Concentration Units: UG/LITER

Parameter	Result	
Cyanide	5	U

Client Sample ID: 66600S1

Sample Date: N/A
IT Sample ID: MM0109S1
Prep Date: 09/13/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW34B909131
Concentration Units: % RECOVERY

Parameter	Result
Cyanide	91.7

Advanced Sciences, Inc.
Date: 05-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Sulfide - - WW 085

Client Sample ID: QXW85B909123

Sample Date: N/A
IT Sample ID: 85B909123
Prep Date: 09/12/89
Analysis Date: (Completed) 09/12/89
Blank Sample ID: QXW85B909123
Concentration Units: MG/LITER

Parameter	Result	
Sulfide	.5	U

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0090
Prep Date: 09/12/89
Analysis Date: (Completed) 09/12/89
Blank Sample ID: QXW85B909123
Concentration Units: MG/LITER

Parameter	Result	
Sulfide	.5	U

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0091
Prep Date: 09/12/89
Analysis Date: (Completed) 09/12/89
Blank Sample ID: QXW85B909123
Concentration Units: MG/LITER

Parameter	Result	
Sulfide	.5	U

Advanced Sciences, Inc.
Date: 05-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Sulfide - - WW 085

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0092
Prep Date: 09/12/89
Analysis Date: (Completed) 09/12/89
Blank Sample ID: QXW85B909123
Concentration Units: MG/LITER

Parameter	Result
Sulfide	.5 U

Client Sample ID: 66600MS

Sample Date: N/A
IT Sample ID: MM0093MS
Prep Date: 09/12/89
Analysis Date: (Completed) 09/12/89
Blank Sample ID: QXW85B909123
Concentration Units: % RECOVERY

Parameter	Result
Sulfide	105

Client Sample ID: 66600MSD

Sample Date: N/A
IT Sample ID: MM0094MSD
Prep Date: 09/12/89
Analysis Date: (Completed) 09/12/89
Blank Sample ID: QXW85B909123
Concentration Units: % RECOVERY

Parameter	Result
Sulfide	115

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
P.O. Box 549
Oak Ridge, TN 37831
ATTN: Mary Hall

September 29, 1989

Job Number: ITNT 44133 (ITNT 35609)

P.O. Number: 464085.01

This is the Certificate of Analysis for the following samples:

Client Project ID:	Fernald RI/FS
Date Received by Lab:	09/13/89
Number of Samples:	Five (5)
Sample Type:	Water-three (3), Matrix spikes-two (2)

I. Introduction

On 09/13/89, three (3) water samples and two (2) matrix spikes arrived at the ITAS-Knoxville, Tennessee laboratory from the IT-Mixed Waste Laboratory in Oak Ridge, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all CLP data are not blank corrected. Table 1 lists field and ITAS numbers, sample matrix and analysis requested.

The samples were analyzed for Target Compound List (TCL) and additional Appendix IX volatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 2/88 Statement of Work.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
September 29, 1989

Client Project ID: Fernald RI/FS

Job Number: ITNT 44133
(ITNT 35609)

III. Quality Control

The volatiles analyses were performed on 09/20 and 09/21/89 by purge and trap with J&W DB-624 Megabore column on a Finnigan OWA GC/MS/DS. The CLP Target Compound List (TCL) analysis was straightforward, with no unusual difficulties. MS/MSD analysis of sample MM0082 showed all spikes within advisory limits. Additional specific Appendix IX compounds were generally well behaved, and were standardized for by initial (3-point) and continuing calibrations: these data are included in the standards data section. Some compounds were, however, "bad actors" and were treated differently: dichlorodifluoromethane, acetonitrile, isobutyl alcohol, dioxane and pyridine were all analyzed for based on essentially single standard runs establishing their spectra, retention time, and practical detection limit. Whereas the freon showed low response due to loss through the trap, the others tended to soil the system and show carryover at the levels required for detection. Chromatograms at the end of the standards data section indicate how the bad actors were evaluated: acetonitrile was run at 300 µg/liter (on a 6 rather than 10 minute purge, to examine trap efficiency for costandard dichlorodifluoromethane), isobutanol and dioxane at higher levels; and pyridine (which overlaps with surrogate toluene-D8) was finally seen at 200,000 µg/liter. These standards were not all run on the same day as the samples because (as already indicated) system contamination and false positives might occur, and levels were still being determined as the sample analyses from several projects progressed. Except from the one difference in purge time, all of the standards were run under the same conditions as the samples. The final reported quantitation limits for the bad actors were based on reasonable projections from the chromatograms, and, for dichlorodifluoromethane, the response at the upper level of the initial calibration. The compounds just discussed were evaluated manually. Other species had software target search; their quantitation limits were based on the responses seen, EPA published levels, and previous studies. The package was put together in CLP format. An additional, Appendix IX form was included with each CLP TCL form 1; in some cases the data were redundant, as the lists overlapped. There were no other problems seen in final review of the data.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected.
E - Compound exceeded calibration range of instrument.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below the contract required detection limit. The value given was an estimate.
S - Spiked compound.
B - Compound was found in the method blank.

IT Corporation
September 29, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT 44133
(ITNT 35609)

TABLE 1

SAMPLE SUMMARY TABLE

Field #	IT-MWL #	ITAS #	Matrix	Analysis
66598	MM0080	JJ5969	Water	VO
66599	MM0081	JJ5970	Water	VO
66600	MM0082	JJ5971	Water	VO
66600 MS	MM0083	JJ5972	Water	QC-MS-VO
66600 MSD	MM0084	JJ5973	Water	QC-MSD-VO

Abbreviations: VO = Volatiles
MS = Matrix spike
MSD = Matrix spike duplicate

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

* - Values outside of contract required QC limits.

Advanced Sciences, Inc.
Date: 01-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Volatile Organics - Modified Current EPA CLP Protocol - MV 713

Client Sample ID: QXM09B909211

Sample Date: N/A
IT Sample ID: XVB0921
Prep Date:
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXM09B909211
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Chloromethane	10	U	Acrolein	10	U
Bromomethane	10	U	Acrylonitrile	10	U
Vinyl chloride	10	U	2-Chloro-1,3-butadiene	5	U
Chloroethane	10	U	3-Chloropropene	5	U
Methylene chloride	2	J	1,2-dibromo-3-chloropropane	10	U
Acetone	10	U	1,2-Dibromoethane	5	U
Carbon disulfide	5	U	Dibromomethane	10	U
1,1-Dichloroethene	5	U	trans-1,4-Dichloro-2-butene	20	U
1,1-Dichloroethane	5	U	Dichlorodifluoromethane	200	U
Chloroform	5	U	trans-1,2-Dichloroethene	5	U
1,2-Dichloroethane	5	U	1,4-Dioxane	1000	U
2-Butanone	10	U	Ethyl cyanide	100	U
1,1,1-Trichloroethane	5	U	Ethyl methacrylate	10	U
Carbon Tetrachloride	5	U	Iodomethane	5	U
Vinyl Acetate	10	U	Isobutyl alcohol	3000	U
Bromodichloromethane	5	U	Methacrylonitrile	10	U
1,2-Dichloropropane	5	U	Methyl methacrylate	10	U
cis-1,3-Dichloropropene	5	U	Pyridine	50000	U
Trichloroethene	5	U	1,1,1,2-Tetrachloroethane	5	U
Dibromochloromethane	5	U	Trichlorofluoromethane	5	U
1,1,2-Trichloroethane	5	U	1,2,3-Trichloropropane	5	U
Benzene	5	U			
trans-1,3-Dichloropropene	5	U			
Bromoform	5	U			
4-Methyl-2-pentanone	10	U			
2-Hexanone	10	U			
Tetrachlorethene	5	U			
1,1,2,2-Tetrachloroethane	5	U			
Toluene	5	U			
Chlorobenzene	5	U			
Ethylbenzene	5	U			
Styrene	5	U			
Total xylenes	5	U			
Acetonitrile	200	U			

Advanced Sciences, Inc.
Date: 01-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Volatile Organics - Modified Current EPA CLP Protocol - MV 713

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: JJ5969
Prep Date:
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXM09B909211
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Chloromethane	10	U	Acrolein	10	U
Bromomethane	10	U	Acrylonitrile	10	U
Vinyl chloride	10	U	2-Chloro-1,3-butadiene	5	U
Chloroethane	10	U	3-Chloropropene	5	U
Methylene chloride	5	U	1,2-dibromo-3-chloropropane	10	U
Acetone	10	U	1,2-Dibromoethane	5	U
Carbon disulfide	5	U	Dibromomethane	10	U
1,1-Dichloroethene	5	U	trans-1,4-Dichloro-2-butene	20	U
1,1-Dichloroethane	5	U	Dichlorodifluoromethane	200	U
Chloroform	5	U	trans-1,2-Dichloroethene	5	U
1,2-Dichloroethane	5	U	1,4-Dioxane	1000	U
2-Butanone	10	U	Ethyl cyanide	100	U
1,1,1-Trichloroethane	5	U	Ethyl methacrylate	10	U
Carbon Tetrachloride	5	U	Iodomethane	5	U
Vinyl Acetate	10	U	Isobutyl alcohol	3000	U
Bromodichloromethane	5	U	Methacrylonitrile	10	U
1,2-Dichloropropane	5	U	Methyl methacrylate	10	U
cis-1,3-Dichloropropene	5	U	Pyridine	50000	U
Trichloroethene	5	U	1,1,1,2-Tetrachloroethane	5	U
Dibromochloromethane	5	U	Trichlorofluoromethane	5	U
1,1,2-Trichloroethane	5	U	1,2,3-Trichloropropane	5	U
Benzene	5	U			
trans-1,3-Dichloropropene	5	U			
Bromoform	5	U			
4-Methyl-2-pentanone	10	U			
2-Hexanone	10	U			
Tetrachlorethene	5	U			
1,1,2,2-Tetrachloroethane	5	U			
Toluene	5	U			
Chlorobenzene	5	U			
Ethylbenzene	5	U			
Styrene	5	U			
Total xylenes	5	U			
Acetonitrile	200	U			

Advanced Sciences, Inc.
Date: 01-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Volatile Organics - Modified Current EPA CLP Protocol - MV 713

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: JJ5970
Prep Date:
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXM09B909211
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Chloromethane	10	U	Acrolein	10	U
Bromomethane	10	U	Acrylonitrile	10	U
Vinyl chloride	10	U	2-Chloro-1,3-butadiene	5	U
Chloroethane	10	U	3-Chloropropene	5	U
Methylene chloride	5	U	1,2-dibromo-3-chloropropane	10	U
Acetone	10	U	1,2-Dibromoethane	5	U
Carbon disulfide	10		Dibromomethane	10	U
1,1-Dichloroethene	5	U	trans-1,4-Dichloro-2-butene	20	U
1,1-Dichloroethane	5	U	Dichlorodifluoromethane	200	U
Chloroform	5	U	trans-1,2-Dichloroethene	5	U
1,2-Dichloroethane	5	U	1,4-Dioxane	1000	U
2-Butanone	10	U	Ethyl cyanide	100	U
1,1,1-Trichloroethane	5	U	Ethyl methacrylate	10	U
Carbon Tetrachloride	5	U	Iodomethane	5	U
Vinyl Acetate	10	U	Isobutyl alcohol	3000	U
Bromodichloromethane	5	U	Methacrylonitrile	10	U
1,2-Dichloropropane	5	U	Methyl methacrylate	10	U
cis-1,3-Dichloropropene	5	U	Pyridine	50000	U
Trichloroethene	5	U	1,1,1,2-Tetrachloroethane	5	U
Dibromochloromethane	5	U	Trichlorofluoromethane	5	U
1,1,2-Trichloroethane	5	U	1,2,3-Trichloropropane	5	U
Benzene	5	U			
trans-1,3-Dichloropropene	5	U			
Bromoform	5	U			
4-Methyl-2-pentanone	10	U			
2-Hexanone	10	U			
Tetrachlorethene	5	U			
1,1,2,2-Tetrachloroethane	5	U			
Toluene	5	U			
Chlorobenzene	5	U			
Ethylbenzene	5	U			
Styrene	5	U			
Total xylenes	5	U			
Acetonitrile	200	U			

Advanced Sciences, Inc.
Date: 01-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Volatile Organics - Modified Current EPA CLP Protocol - MV 713

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: JJ5971
Prep Date:
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXM09B909201
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Chloromethane	10	U	Acrolein	10	U
Bromomethane	10	U	Acrylonitrile	10	U
Vinyl chloride	10	U	2-Chloro-1,3-butadiene	5	U
Chloroethane	10	U	3-Chloropropene	5	U
Methylene chloride	5	U	1,2-dibromo-3-chloropropane	10	U
Acetone	10	U	1,2-Dibromoethane	5	U
Carbon disulfide	1	J	Dibromomethane	10	U
1,1-Dichloroethene	5	U	trans-1,4-Dichloro-2-butene	20	U
1,1-Dichloroethane	5	U	Dichlorodifluoromethane	200	U
Chloroform	5	U	trans-1,2-Dichloroethene	5	U
1,2-Dichloroethane	5	U	1,4-Dioxane	1000	U
2-Butanone	10	U	Ethyl cyanide	100	U
1,1,1-Trichloroethane	5	U	Ethyl methacrylate	10	U
Carbon Tetrachloride	5	U	Iodomethane	5	U
Vinyl Acetate	10	U	Isobutyl alcohol	3000	U
Bromodichloromethane	5	U	Methacrylonitrile	10	U
1,2-Dichloropropane	5	U	Methyl methacrylate	10	U
cis-1,3-Dichloropropene	5	U	Pyridine	50000	U
Trichloroethene	5	U	1,1,1,2-Tetrachloroethane	5	U
Dibromochloromethane	5	U	Trichlorofluoromethane	5	U
1,1,2-Trichloroethane	5	U	1,2,3-Trichloropropane	5	U
Benzene	5	U			
trans-1,3-Dichloropropene	5	U			
Bromoform	5	U			
4-Methyl-2-pentanone	10	U			
2-Hexanone	10	U			
Tetrachlorethene	5	U			
1,1,2,2-Tetrachloroethane	5	U			
Toluene	5	U			
Chlorobenzene	5	U			
Ethylbenzene	5	U			
Styrene	5	U			
Total xylenes	5	U			
Acetonitrile	200	U			

Advanced Sciences, Inc.
Date: 01-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Volatile Organics - Modified Current EPA CLP Protocol - MV 713

Client Sample ID: 66600MS

Sample Date: N/A
IT Sample ID: JJ5972MS
Prep Date:
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXM09B909201
Concentration Units: % RECOVERY

Parameter	Result
1,1-Dichloroethene	111
Trichloroethene	99
Benzene	89
Toluene	90
Chlorobenzene	108

Client Sample ID: 66600MSD

Sample Date: N/A
IT Sample ID: JJ5973MSD
Prep Date:
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXM09B909201
Concentration Units: % RECOVERY

Parameter	Result
1,1-Dichloroethene	109
Trichloroethene	99
Benzene	91
Toluene	89
Chlorobenzene	108

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
P.O. Box 549
Oak Ridge, TN 37831
ATTN: Mary Hall

October 27, 1989

Job Number: ITNT 44219 (ITNT 35609)

P.O. Number: 464085.01

This is the Certificate of Analysis for the following samples:

Client Project ID:	Fernald RI/FS
Date Received by Lab:	09/26/89
Number of Samples:	Five (5)
Sample Type:	Water extracts

I. Introduction

On 09/26/89, five (5) water extracts arrived at the ITAS-Knoxville, Tennessee laboratory from the IT-Mixed Waste Laboratory in Oak Ridge, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all CLP data are not blank corrected. Table 1 lists field and ITAS numbers, sample matrix and analysis requested.

The samples were analyzed for Target Compound List (TCL) and additional Appendix IX semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 2/88 Statement of Work.

Reviewed and Approved:

Alyce Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
October 27, 1989

Client Project ID: Fernald RI/FS

Job Number: ITNT 44219
(ITNT 35609)

III. Quality Control

The semivolatiles analyses were performed on 09/28, 10/02 and 10/05/89 by direct injection of sample extract on a Restek RTX-5 capillary column on a Finnigan 4500 GC/MS/DS. The sample runs met with problems in that 66599 and 66600 (plus MS and MSD) all had low or nonexistent acid surrogate recoveries. The fact that all three runs, unspiked and spiked, of 66600 showed similar recoveries tended to confirm a matrix effect for that sample. Sample 66599 was reextracted (beyond the usual CLP holding time) and its rerun also confirmed a matrix effect. Both original and rerun data for 66599 were submitted. The MS/MSD analysis on 66600 showed further examples of the matrix effect on primarily acidic species. Standardization was done for all analytes. In addition to those for TCL's, calibration and continuing standards (AC, A9, or H suffix, e.g. SSTD050AC) were run for non-TCL Appendix IX species. Hexachlorophene showed poorest response and required an additional higher level calibration (on 10/02/89) to complete a 5-point. All standards were reported in CLP format, and all data supplied. The quantitation limits listed were based on standard results, CLP protocol, and data from previous studies. There were no other problems seen in final review of the data.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected.
E - Compound exceeded calibration range of instrument.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below the contract required detection limit. The value given was an estimate.
S - Spiked compound.
B - Compound was found in the method blank.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
October 27, 1989

Client Project ID: Fernald RI/FS

Job Number: ITNT 44219
(ITNT 35609)

TABLE 1

SAMPLE SUMMARY TABLE

Field #	ITAS # (ITMWL #)	Matrix	Analysis
66598	MM0085	Water	BNA
66599	MM0086	Water	BNA
66599 RE	MM0086	Water	RE-BNA
66600	MM0087	Water	BNA
66600 MS	MM0088	Water	QC-MS-BNA
66600 MSD	MM0089	Water	QC-MSD-BNA

Abbreviations: BNA = Semivolatiles
MS = Matrix spike
MSD = Matrix spike duplicate
RE = Reprepped/reanalyzed

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

• - Values outside of contract required QC limits.

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0085
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	10	U
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66598

Sample Date: N/A
IT Sample ID: MM0085
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences. Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE. TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0086
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	3	J
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	3	J
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66599

Sample Date: N/A
IT Sample ID: MM0086
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0087
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	10	U
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66600

Sample Date: N/A
IT Sample ID: MM0087
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66600MS

Sample Date: N/A
IT Sample ID: MM0088MS
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: % RECOVERY

Parameter	Result	
Phenol	0	*
2-Chlorophenol	0	*
1,4-Dichlorobenzene	47	
N-Nitroso-di-n-propylamine	0	*
1,2,4-Trichlorobenzene	55	
4-Chloro-3-methylphenol	1	*
Acenaphthene	65	
4-Nitrophenol	22	
2,4-Dinitrotoluene	67	
Pentachlorophenol	22	
Pyrene	92	

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66600MSD

Sample Date: N/A
IT Sample ID: MM0089MSD
Prep Date: 09/14/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXM12B909141
Concentration Units: % RECOVERY

Parameter	Result	
Phenol	0	*
2-Chlorophenol	5	*
1,4-Dichlorobenzene	58	
N-Nitroso-di-n-propylamine	0	*
1,2,4-Trichlorobenzene	71	
4-Chloro-3-methylphenol	3	*
Acenaphthene	81	
4-Nitrophenol	40	
2,4-Dinitrotoluene	83	
Pentachlorophenol	44	
Pyrene	106	

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66599R

Sample Date: N/A
IT Sample ID: MM0086R
Prep Date: 10/04/89
Analysis Date: (Completed) 10/05/89
Blank Sample ID: QXM12B910041
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	2	JB
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35609

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66599R

Sample Date: N/A
IT Sample ID: MM0086R
Prep Date: 10/04/89
Analysis Date: (Completed) 10/05/89
Blank Sample ID: QXM12B910041
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Attn: Heather Bond
C/O ASI Inc.
10845 Hamilton Cleves Road
Ross, OH 45061

Date: November 2, 1989

Page 1 of 4

Job Number: ITNT 35610

P.O Number: Accounts Payable

This is the Certificate of Analysis for the following:

Client Project ID: FMPC RI/FS
Date Received by Lab: 9/13/89
Number of Samples: Two (2)
Sample Type: Groundwater

66595
66556

Introduction

On September 13, 1989, two (2) groundwater samples were received at ITAS-Oak Ridge Lab from Advanced Sciences Inc., Ross, Ohio. The list of analytical tests performed, as well as date of receipt and analysis can be found in the attached report.

Blanks are identified with client sample ID's starting with either "QX..B" or "QX...B". Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits. The metal analysis was performed by Inductively Coupled Plasma (ICP) Spectrometry, except for lead which was analyzed by Graphite Furnace Atomic Absorption Spectroscopy.

The sample was analyzed for HSL volatile compounds using the EPA CLP 10/86 Statement of Work.

Reviewed and Approved:

Snell A. Mills III

Snell A. Mills III
Laboratory Manager

SAM/sca

III. Quality Control

The volatile analysis was performed on 09/20/89. The sample runs proceeded well. The MS/MSD analyses were performed on sample 66600, Project ITNT 35609. All QC results were within QC limits.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected.
B - Compound was found in the method blank.
J - Compound detected but below the contract required quantitation limit. The value given was an estimate.

Advanced Sciences, Inc.
Date: November 2, 1989
Client Project ID: RI/FS Fernald

IT ANALYTICAL SERVICES
OAK RIDGE, TN
Page 3 of 4
Job Number: ITNT 35610

SAMPLE SUMMARY TABLE

Field #	ITAS #	Matrix	Conc.	Analysis
66595	MM0125	WATER	LOW	VOA
	MM0130	WATER	LOW	METALS
66556	MM0121	WATER	LOW	$Cl^-/Fl^-/SO^{-2}_4$
	MM0120	WATER	LOW	NITRATE
	MM0122	WATER	LOW	TOC/ TOX

Abbreviations:
VOA - Volatiles
TOC - Total Organic Carbon
TOX - Total Organic Halides
Cl^- - Chloride
Fl^- - Fluoride
SO^{-2}_4 - Sulfate

Advanced Sciences, Inc.
Date: November 2, 1989
Client Project ID: RI/FS Fernald

IT ANALYTICAL SERVICES
OAK RIDGE, TN
Page 4 of 4
Job Number: ITNT 35610

T O C

Field #	Sample #	Range
66556	MM0122	2.02 - 2.57
	BLANK	0.059 - 0.311

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromnos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

* - Values outside of contract required QC limits.

Advanced Sciences, Inc.
Date: 03-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

EPA CLP TCL Volatile Organics by GCMS - Current EPA CLP Protocol - MV 702

Client Sample ID: 66556

Sample Date: N/A
IT Sample ID: MM0125
Prep Date:
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXM09B909203
Concentration Units: UG/LITER

Parameter	Result	
Methylene chloride	5	U
Acetone	10	U
1,1-Dichloroethane	5	U
Trichloroethene	5	U
Tetrachlorethene	5	U
Toluene	5	U

Client Sample ID: QXM09B909203

Sample Date: N/A
IT Sample ID: XVB0920C
Prep Date:
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXM09B909203
Concentration Units: UG/LITER

Parameter	Result	
Methylene chloride	2	J
Acetone	10	U
1,1-Dichloroethane	5	U
Trichloroethene	5	U
Tetrachlorethene	5	U
Toluene	5	U

Advanced Sciences, Inc.
Date: 03-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Metals by ICP - EPA 200.7 - AP 701

Client Sample ID: QXA16B909263

Sample Date: N/A
IT Sample ID: 16B909263
Prep Date: 09/26/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXA16B909263
Concentration Units: MG/LITER

Parameter	Result
Silver	.01 U
Aluminum	.06 U
Barium	.002 U
Beryllium	.001 U
Calcium	.02 U
Cobalt	.01 U
Chromium	.01 U
Copper	.01 U
Iron	.01 U
Magnesium	.06 U
Nickel	.02 U
Vanadium	.01 U
Zinc	.002 U

Advanced Sciences, Inc.
Date: 03-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Metals by ICP - EPA 200.7 - AP 701

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0130
Prep Date: 09/26/89
Analysis Date: (Completed) 10/02/89
Blank Sample ID: QXA16B909263
Concentration Units: MG/LITER

Parameter	Result
Silver	.01 U
Aluminum	.582
Barium	.093
Beryllium	.002
Calcium	570
Cobalt	.012
Chromium	.038
Copper	.01 U
Iron	.286
Magnesium	212
Nickel	.056
Vanadium	.061
Zinc	.292

Advanced Sciences, Inc.
Date: 03-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Lead by Furnace AA - EPA SW846 3020 & 7421 - AG 019

Client Sample ID: QXA17B909263

Sample Date: N/A
IT Sample ID: 17B909263
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA17B909263
Concentration Units: MG/LITER

Parameter	Result
Lead	.002 U

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0130
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA17B909263
Concentration Units: MG/LITER

Parameter	Result
Lead	.002

Advanced Sciences, Inc.
Date: 03-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Chloride by Ion Specific Electrode - EPA 325.3 - WW 017

Client Sample ID: QXW17B909215

Sample Date: N/A
IT Sample ID: 17B909215
Prep Date: 09/21/89
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXW17B909215
Concentration Units: MG/LITER

Parameter	Result
Chloride	.5 U

Client Sample ID: 66556

Sample Date: N/A
IT Sample ID: MM0121
Prep Date: 09/21/89
Analysis Date: (Completed) 09/21/89
Blank Sample ID: QXW17B909215
Concentration Units: MG/LITER

Parameter	Result
Chloride	1040

Advanced Sciences, Inc.
Date: 03-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Flouride by Ion Specific Electrode - EPA 340.2 - WW 042

Client Sample ID: QXW42B910092

Sample Date: N/A
IT Sample ID: 42B910092
Prep Date: 10/09/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXW42B910092
Concentration Units: MG/LITER

Parameter	Result
Fluoride	.05 U

Client Sample ID: 66556

Sample Date: N/A
IT Sample ID: MM0121
Prep Date: 10/09/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXW42B910092
Concentration Units: MG/LITER

Parameter	Result
Fluoride	.36

Advanced Sciences, Inc.
Date: 03-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Nitrate, as N - EPA 353.3 - WW 053

Client Sample ID: QXW53B909223

Sample Date: N/A
IT Sample ID: 53B909223
Prep Date: 09/22/89
Analysis Date: (Completed) 09/22/89
Blank Sample ID: QXW53B909223
Concentration Units: MG/LITER

Parameter	Result
Nitrate	.1 U

Client Sample ID: 66556

Sample Date: N/A
IT Sample ID: MM0120
Prep Date: 09/22/89
Analysis Date: (Completed) 09/22/89
Blank Sample ID: QXW53B909223
Concentration Units: MG/LITER

Parameter	Result
Nitrate	132

Advanced Sciences, Inc.
Date: 03-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Total Organic Carbon - EPA 415.1 - OM 001

Client Sample ID: QX001B909182

Sample Date: N/A
IT Sample ID: 01B909182
Prep Date: 09/18/89
Analysis Date: (Completed) 09/18/89
Blank Sample ID: QX001B909182
Concentration Units: MG/LITER

Parameter	Result	
Total Organic Carbon	1	U

Client Sample ID: 66556

Sample Date: N/A
IT Sample ID: MM0122
Prep Date: 09/18/89
Analysis Date: (Completed) 09/18/89
Blank Sample ID: QX001B909182
Concentration Units: MG/LITER

Parameter	Result
Total Organic Carbon	2.27

Advanced Sciences, Inc.
Date: 03-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Total Organic Halides - EPA 450.1/SW846 9020 - OM 004

Client Sample ID: QX004B909181

Sample Date: N/A
IT Sample ID: 04B909181
Prep Date: 09/18/89
Analysis Date: (Completed) 09/18/89
Blank Sample ID: QX004B909181
Concentration Units: MG/LITER

Parameter	Result
Total Organic Halides	.01 U

Client Sample ID: 66556

Sample Date: N/A
IT Sample ID: MM0122
Prep Date: 09/18/89
Analysis Date: (Completed) 09/18/89
Blank Sample ID: QX004B909181
Concentration Units: MG/LITER

Parameter	Result
Total Organic Halides	.039

Advanced Sciences, Inc.
Date: 03-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Sulfate - EPA 375.4 - WW 081

Client Sample ID: QXW81B909156

Sample Date: N/A
IT Sample ID: 81B909156
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW81B909156
Concentration Units: MG/LITER

Parameter	Result	
Sulfate	2	U

Client Sample ID: 66556

Sample Date: N/A
IT Sample ID: MM0121
Prep Date: 09/15/89
Analysis Date: (Completed) 09/15/89
Blank Sample ID: QXW81B909156
Concentration Units: MG/LITER

Parameter	Result
Sulfate	677

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Attn: Cindy Capannari
C/O ASI Inc.
10845 Hamilton Cleves Road
Ross, OH 45061

Date: November 16, 1989

Page 1 of 4

Job Number: ITNT 35610

P.O Number: Accounts Payable

This is the Certificate of Analysis for the following samples:

Client Project ID:	Fernald RI/FS	66556 9.25 Chem
Date Received by Lab:	09/13/89	66583 App 9 Org
Number of Samples:	Three (3)	66595 App 9
Sample Type:	Water	

I. INTRODUCTION

On September 13, 1989, three (3) water samples were received at ITAS-Oak Ridge Laboratory from Advanced Sciences Inc., Ross, Ohio. The list of analytical tests performed, as well as date of receipt and analysis can be found in the attached report.

One cooler containing the organophosphorus pesticide sample 66583 and all requested analyses of sample 66582 were not received from Federal Express with the rest of the shipment. The temperature at arrival was 15°C, which is outside of QC limits. The samples in this cooler were not analyzed but returned per client request.

Blanks are identified with client sample ID's starting with either "QX..B" or "QX...B". Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. ANALYTICAL RESULTS/METHODOLOGY

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

Reviewed and Approved
Marshall for Snell Mills III
Snell M. Mills, III
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

The sample (66595) was analyzed for TCL and additional Appendix IX volatile organic compounds by gas chromatography/mass spectroscopy in accordance with EPA CLP 2/88 Statement of Work. This analysis was performed at ITAS-Knoxville, Tennessee Laboratory, narrative submitted separately.

The samples were analyzed for TCL and additional Appendix IX semivolatiles organic compounds by gas chromatography/mass spectroscopy in accordance with the EPA CLP 2/88 Statement of Work. The samples were extracted at the IT-Mixed Waste Laboratory in Oak Ridge, Tennessee, and the analysis was performed at ITAS-Knoxville, Tennessee Laboratory, narrative submitted separately.

The samples were extracted for TCL and additional Appendix IX pesticide/PCB compounds (Isochin and Kepone) and analyzed by gas chromatography using the EPA CLP 10/86 Statement of Work.

The samples were extracted and analyzed for Appendix IX herbicide compounds at ITAS-Knoxville, Tennessee Laboratory by gas chromatography using EPA Method 8150 USEPA SW-846, 3rd Ed., 1986, narrative submitted separately.

The sample was analyzed for TCL and additional IX inorganics using the EPA CLP 7/87 Statement of Work.

The sample was prepared and analyzed for Sulfide in accordance with EPA Method 9030, SW-846, 3rd Edition, 1986.

The sample was prepared and analyzed for fluoride in accordance with method 4500-F-C Ion Selective Electrode Method, Standard Methods, 17th Edition 1989.

The sample was analyzed for both isomer specific 2,3,7,8-TCDD and Total Tetra through hexa (Cl_4 - Cl_6) dioxin and furan homologs using a modified version of EPA Method 8280, revised September, 1986. The analysis was performed at ITAS - Technology Development Laboratory, Knoxville, Tennessee, narrative submitted separately.

The sample was analyzed for organophosphorus pesticide, at the ITAS-San Jose Laboratory, San Jose, California, Appendix IX compounds using EPA Method 8140, USEPA SW-846, 3rd Edition, 1986, to be submitted under separate cover.

III. QUALITY CONTROL

The pesticide and aroclor QC for these samples are referenced to ITNT 35609, sample number 66600, submitted separately.

The pesticide and aroclor analysis was performed on 09/26/89 and 09/28/89. All samples and blanks were prepped as low-level waters. Three (3) out of three (3) water pesticide surrogate recovery was within the QC required limit.

Organic data was reported with qualifiers as follows:

U - Compound analyzed for but not detected.
E - Compound exceeded calibration range of instrument.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below the contract required quantitation limit. The value given was an estimate.
B - Compound was found in the method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer intentatively identified compounds.

The inorganic QC for these samples are referenced to ITNT 35609, sample number 66600, submitted separately. The samples were prepared for ICP analysis on 09/26/89 and analyzed on 10/02/89 and 10/12/89. The zinc and barium serial dilutions did not meet QC requirements and is flagged with an "E".

Mercury analysis was prepared and analyzed on 09/25/89 by cold vapor analyses.

Potassium analysis was prepared on 09/26/89 and analyzed on 09/28/89 by flame AA.

The samples were prepared for GFAA analysis on 09/26/89. The samples were analyzed during the period 10/04/89 - 10/09/89. All selenium samples were outside the 15% window for analytical spike recovery and the matrix spike was outside QC limits.

The samples were prepared on 09/18/89 for cyanide analysis and analyzed on 09/27/89.

The samples were prepared and analyzed for sulfide on 09/20/89.

The samples were prepared and analyzed for fluoride on 09/13/89. The MS/MSD analyses were performed on sample 66532, (Job Number: ITNT 35605, to be submitted separately).

Inorganic data was reported with the following qualifiers:

N - Matrix spike outside QC limits
* - Duplicate values outside QC limits
E - Furnace anal. spike <40%; ICP serial dilution outside QC limits
W - Furnace anal. spike recovery outside + or - 15% window
S - Method of standard used (MSA)
+ - Correlation coefficient for MSA <0.995

IT ANALYTICAL SERVICES
OAK RIDGE, TN

Advanced Sciences, Inc.
Date: November 16, 1989
Client Project ID: RI/FS Fernald

Job Number: ITNT 35610

SAMPLE SUMMARY TABLE

Field #	ITAS #	Matrix	Conc.	Analysis
66556	MM0121	WATER	LOW	FLUORIDE
66583	MM0123	WATER	LOW	BNA
	MM0124	WATER	LOW	PEST/PCB/HERB
66595	MM0125	WATER	LOW	VOA
	MM0126	WATER	LOW	BNA
	MM0127	WATER	LOW	SULFIDE
	MM0128	WATER	LOW	PEST/PCB/HERB
	MM0129	WATER	LOW	OP PEST
	MM0130	WATER	LOW	METALS
	MM0131	WATER	LOW	CYANIDE
	MM0132	WATER	LOW	DIOXIN/FURAN

ABBREVIATIONS:
- TOC - Total Organic Carbon
- TOX - Total Organic Halides
- BNA - Semivolatiles
- OP - Organophosphorus
- PEST - Pesticides
- HERB - Herbicides
- VOA - Volatile Organic Analysis

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

• - Values outside of contract required QC limits.

Table EDT-5

EPA CLP INORGANIC QUALIFIERS

U - Indicates compound was analyzed for but not detected.

B - The reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL).

E - The reported value is estimated because of the presence of interference.

M - Duplicate injection precision not met.

N - Spiked sample recovery not within control limits.

S - The reported value was determined by the Method of Standard Additions.

W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

G - Native analyte > 4 times spike added, therefore acceptance criteria do not apply.

X - Detection limit is higher than normal due to sample matrix interferences.

* - Duplicate analysis not within control limits.

+ - Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Advanced Sciences. Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE. TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: QXG19B909151

Sample Date: N/A
IT Sample ID: QX1452
Prep Date: 09/15/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909151
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4,4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4,4'-DDD	.1	U
Endosulfan sulfate	.1	U
4,4'-DDT	.1	U
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	.1	U

Advanced Sciences. Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE. TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66583

Sample Date: N/A
IT Sample ID: MM0124
Prep Date: 09/15/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909151
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4,4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4,4'-DDD	.1	U
Endosulfan sulfate	.1	U
4,4'-DDT	.1	U
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	.1	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0128
Prep Date: 09/15/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909151
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4,4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4,4'-DDD	.1	U
Endosulfan sulfate	.1	U
4,4'-DDT	.1	U
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	.1	U

Advanced Sciences. Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE. TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Metals by ICP - Modified Current EPA CLP Protocol - AP 714

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0130
Prep Date: 09/26/89
Analysis Date: (Completed) 10/12/89
Blank Sample ID: QXA14B909261
Concentration Units: UG/LITER

Parameter	Result	
Aluminum	582	
Antimony	30	U
Barium	93.4	BE
Beryllium	2.5	B
Cadmium	24.5	
Calcium	570000	
Chromium	38	
Cobalt	12.1	B
Copper	10	U
Iron	286	
Magnesium	212000	
Manganese	398	
Nickel	55.9	
Silver	10	U
Sodium	210000	
Vanadium	61.2	
Zinc	292	E
Osmium	469	
Tin	30	U

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Metals by Furnace AA - Current EPA CLP Protocol - AG 702

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0130
Prep Date: 09/26/89
Analysis Date: (Completed) 10/09/89
Blank Sample ID: QXA12B909261
Concentration Units: UG/LITER

Parameter	Result	
Arsenic	2	UW
Lead	2.5	B
Selenium	2	UWN
Thallium	1	U

Advanced Sciences. Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Mercury by Cold Vapor AA - Current EPA CLP Protocol - AV 002

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0130
Prep Date: 09/25/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QXA00B909252
Concentration Units: UG/LITER

Parameter	Result	
Mercury	.2	UN

Advanced Sciences. Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Potassium by Flame AA - Current EPA CLP Protocol - AA 069

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0130
Prep Date: 09/26/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXA14B909261
Concentration Units: UG/LITER

Parameter	Result
Potassium	5460

Advanced Sciences, Inc.
Date: 10-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Total Cyanide - Current EPA CLP Protocol - WW 034

Client Sample ID: QXW34B909182

Sample Date: N/A
IT Sample ID: 34B909182
Prep Date: 09/18/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXW34B909182
Concentration Units: UG/LITER

Parameter	Result	
Cyanide	5	U

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0130
Prep Date: 09/18/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXW34B909182
Concentration Units: UG/LITER

Parameter	Result	
Cyanide	5	U

Advanced Sciences, Inc.
Date: 05-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Sulfide - - WW 085

Client Sample ID: QXW85B909201

Sample Date: N/A
IT Sample ID: 85B909201
Prep Date: 09/20/89
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXW85B909201
Concentration Units: MG/LITER

Parameter	Result
Sulfide	.5 U

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0127
Prep Date: 09/20/89
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXW85B909201
Concentration Units: MG/LITER

Parameter	Result
Sulfide	4.26

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
P.O. Box 549
Oak Ridge, TN 37831
ATTN: Mary Hall

October 31, 1989

Job Number: ITNT 44180 (ITNT 35610)

P.O. Number: 464085.01

This is the Certificate of Analysis for the following sample:

Client Project ID:	Fernald RI/FS
Date Received by Lab:	09/19/89
Number of Samples:	One (1)
Sample Type:	Water

I. Introduction

On 09/19/89, one (1) water sample arrived at the ITAS-Knoxville, Tennessee laboratory from the IT-Mixed Waste Laboratory in Oak Ridge, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all CLP data are not blank corrected. Table 1 lists field and ITAS numbers, sample matrix and analysis requested.

The sample was analyzed for Target Compound List (TCL) and additional Appendix IX volatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 2/88 Statement of Work.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

IT Analytical Services, 5815 Middlebrook Pike, Knoxville, TN 37921

681-1-89

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
October 31, 1989

Client Project ID: Fernald RI/FS

Job Number: ITNT 44180
(ITNT 25610)

III. Quality Control

The volatiles analyses were performed on 09/20/89 by purge and trap with J&W DB-624 Megabore column on a Finnigan OWA GC/MS/DS. The sample and related runs went well. The standardization included the usual protocol for TCL compounds, a three point and continuing calibration for most additional Appendix IX compounds, and specific retention time and detection limit runs for "bad actors", as described in previous project narratives. Despite some initial problems with levels, all analytes were ultimately standardized for, by at least one representative run. All relevant standard data are included in this package. The package was assembled in CLP format. An additional Appendix IX form was included with each CLP TCL form 1. In some cases the data were redundant, as the lists overlapped. There were no other problems seen in final review of the data.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected.
E - Compound exceeded calibration range of instrument.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below the contract required detection limit. The value given was an estimate.
B - Compound was found in the method blank.

IT Corporation
November 16, 1989

Client Project ID: Fernald RI/FS

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNT 44180
(ITNT 35610)

TABLE 1

SAMPLE SUMMARY TABLE

Field #	ITAS # (ITMWL #)	Matrix	Analysis
66595	JJ6186 (MM0125)	Water	VO

Abbreviations: VO - Volatiles

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

• - Values outside of contract required QC limits.

Advanced Sciences, Inc.
Date: 01-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Volatile Organics - Modified Current EPA CLP Protocol - MV 713

Client Sample ID: 66556

Sample Date: N/A
IT Sample ID: JJ6186
Prep Date:
Analysis Date: (Completed) 09/20/89
Blank Sample ID: QXM09B909201
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Chloromethane	10	U	Acrolein	10	U
Bromomethane	10	U	Acrylonitrile	10	U
Vinyl chloride	10	U	2-Chloro-1,3-butadiene	5	U
Chloroethane	10	U	3-Chloropropene	5	U
Methylene chloride	5	U	1,2-dibromo-3-chloropropane	10	U
Acetone	10	U	1,2-Dibromoethane	5	U
Carbon disulfide	5	U	Dibromomethane	10	U
1,1-Dichloroethene	5	U	trans-1,4-Dichloro-2-butene	20	U
1,1-Dichloroethane	5	U	Dichlorodifluoromethane	200	U
Chloroform	5	U	trans-1,2-Dichloroethene	5	U
1,2-Dichloroethane	5	U	1,4-Dioxane	1000	U
2-Butanone	10	U	Ethyl cyanide	100	U
1,1,1-Trichloroethane	5	U	Ethyl methacrylate	10	U
Carbon Tetrachloride	5	U	Iodomethane	5	U
Vinyl Acetate	10	U	Isobutyl alcohol	3000	U
Bromodichloromethane	5	U	Methacrylonitrile	10	U
1,2-Dichloropropane	5	U	Methyl methacrylate	10	U
cis-1,3-Dichloropropene	5	U	Pyridine	50000	U
Trichloroethene	5	U	1,1,1,2-Tetrachloroethane	5	U
Dibromochloromethane	5	U	Trichlorofluoromethane	5	U
1,1,2-Trichloroethane	5	U	1,2,3-Trichloropropane	5	U
Benzene	5	U			
trans-1,3-Dichloropropene	5	U			
Bromoform	5	U			
4-Methyl-2-pentanone	10	U			
2-Hexanone	10	U			
Tetrachlorethene	5	U			
1,1,2,2-Tetrachloroethane	5	U			
Toluene	5	U			
Chlorobenzene	5	U			
Ethylbenzene	5	U			
Styrene	5	U			
Total xylenes	5	U			
Acetonitrile	200	U			

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
P.O. Box 549
Oak Ridge, TN 37831
ATTN: Mary Hall

November 10, 1989

Job Number: ITNT 44219 (ITNT 35610)

P.O. Number: 464085.01

This is the Certificate of Analysis for the following samples:

Client Project ID:	Fernald RI/FS
Date Received by Lab:	09/26/89
Number of Samples:	Three (3)
Sample Type:	Water extracts-two (2), blank extract-one (1)

I. Introduction

On 09/26/89, two (2) water extracts and one (1) blank extract arrived at the ITAS-Knoxville, Tennessee laboratory from the IT-Mixed Waste Laboratory in Oak Ridge, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all CLP data are not blank corrected. Table 1 lists field and ITAS numbers, sample matrix and analysis requested.

The samples were analyzed for Target Compound List (TCL) and additional Appendix IX semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 2/88 Statement of Work.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

IT Corporation
November 10, 1989

Client Project ID: Fernald RI/FS

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNT 44219
(ITNT 35610)

III. Quality Control

The semivolatiles analyses were performed on 09/27, 09/28 and 10/05/89 by direct injection of sample extract on a Restek RTX-5 capillary column on a Finnigan 4500 GC/MS/DS. The sample runs went well except that 66583 showed some low acid surrogate recoveries. The sample was reextracted (outside holding time) and rerun, with better results. Both sets of run data were submitted. Standardization was done for all Appendix IX analytes reported. In addition to the usual TCL standards, 5 point calibrations were run for non-TCL compounds in the course of the overall analysis. The daily standards were compared against these calibrations, and reported in a format similar to that of the CLP continuing calibration forms for TCL's. The non-TCL calibrations were designated with AC, A9, and H suffixes (the last for an 11/02 series to complete a 5 point for hexachlorophene). All standard data were submitted. The quantitation limits listed were based on standard results, CLP protocol, and data from previous studies. There were no other problems seen in final review of the data.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected.
E - Compound exceeded calibration range of instrument.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below the contract required detection limit. The value given was an estimate.
B - Compound was found in the method blank.

IT Corporation
November 10, 1989

Client Project ID: Fernald RI/FS

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNT 44219
(ITNT 35610)

TABLE I

SAMPLE SUMMARY TABLE

Field #	ITAS #	Matrix	Analysis
66583	MM0123	Water	BNA
66583 RE	MM0123	Water	RE-BNA
66595	MM0126	Water	BNA
SBLK1	Q1453	Water	MB-BNA
SBLK2	Q1469	Water	MB-BNA

Abbreviations: BNA = Semivolatiles
RE = Reanalyzed/reprepped sample
MB = Method Blank

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

• - Values outside of contract required QC limits.

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66583

Sample Date: N/A
IT Sample ID: MM0123
Prep Date: 09/15/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	10	U
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	2	J
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	Ethyl methacrylate	20	U
			2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66583

Sample Date: N/A
IT Sample ID: MM0123
Prep Date: 09/15/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
[illegible]methylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
[illegible] methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0126
Prep Date: 09/15/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	3	J
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	3	BJ
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	Ethyl methacrylate	20	U
			2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: MM0126
Prep Date: 09/15/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66583R

Sample Date: N/A
IT Sample ID: MM0123R
Prep Date: 10/04/89
Analysis Date: (Completed) 10/05/89
Blank Sample ID: QXM12B910041
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	2	BJ
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	Ethyl methacrylate	20	U
			2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66583R

Sample Date: N/A
IT Sample ID: MM0123R
Prep Date: 10/04/89
Analysis Date: (Completed) 10/05/89
Blank Sample ID: QXM12B910041
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
Tetraethyldithiopyrophosphat	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
1550 Bear Creek Road
Oak Ridge, TN 37830
ATTN: Mary Hall

November 14, 1989

Job Number: ITNT 44167 (ITNT 35610)

P.O. Number: 464085.01

This is the Certificate of Analysis for the following samples:

Client Project ID:	Fernald
Date Received by Lab:	09/15/89
Number of Samples:	Two (2)
Sample Type:	Water

I. Introduction

On 09/15/89, two (2) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from the IT Mixed Waste Laboratory for the Fernald project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical result before it is reported.

The samples were analyzed for Appendix IX Chlorophenoxy Herbicides by gas chromatography/electron capture detection (GC-ECD) based on SW-846 method 8150.

Reviewed and Approved:

Alyce Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

IT Analytical Services, 5815 Middlebrook Pike, Knoxville, TN 37921

681-1-88

IT Corporation
November 14, 1989

Client Project ID: Fernald

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNT 44167
(ITNT 35610)

III. Quality Control

The samples were extracted for Appendix IX Chlorophenoxy Herbicides on 09/18/89 and analyzed on 09/25/89. No problems were encountered. Spiked blank samples were analyzed with ITAS project BRL 44151. Copies of the QC data are included. Blank BL4797 was not analyzed for 2,4,5-T. It was analyzed on a separate run that did not include a 2,4,5-T standard. A copy of the chromatogram is enclosed. No peak is found at the expected 2,4,5-T retention time.

IT Corporation
November 16, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT 44167
(ITNT 35610)

TABLE 1

SAMPLE SUMMARY TABLE

Field #	ITAS #	ITAS Knoxville #	Matrix
66583	MM0124	JJ6141	Water
66595	MM0128	JJ6142	Water

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Advanced Sciences, Inc.
Date: 05-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

RCRA/Appendix IX/Water Supply Herbicides - SM 509B/EPA SW846-8150 - GC 754

Client Sample ID: QG10B90918D1

Sample Date: N/A
IT Sample ID: BL4797
Prep Date: 09/18/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QG10B90918D1
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.2	U
Propanoic acid, 2-(2,4,5-tri	.1	U
2,4,5-Trichlorophenoxyacetic	.1	U

Client Sample ID: QG10B90918D1MS1

Sample Date: N/A
IT Sample ID: BL4798MS1
Prep Date: 09/18/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QG10B90918D1
Concentration Units: % RECOVERY

Parameter	Result
2,4-Dichlorophenoxyacetic ac	85
Propanoic acid, 2-(2,4,5-tri	92

Client Sample ID: QG10B90918D1MS2

Sample Date: N/A
IT Sample ID: BL4799MS2
Prep Date: 09/18/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QG10B90918D1
Concentration Units: % RECOVERY

Parameter	Result
2,4-Dichlorophenoxyacetic ac	80
Propanoic acid, 2-(2,4,5-tri	62

Advanced Sciences, Inc.
Date: 05-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35610

RCRA/Appendix IX/Water Supply Herbicides - SM 509B/EPA SW846-8150 - GC 754

Client Sample ID: 66583

Sample Date: N/A
IT Sample ID: JJ6141
Prep Date: 09/18/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QG10B90918D1
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.2	U
Propanoic acid, 2-(2,4,5-tri	.1	U
2,4,5-Trichlorophenoxyacetic	.1	U

Client Sample ID: 66595

Sample Date: N/A
IT Sample ID: JJ6142
Prep Date: 09/18/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QG10B90918D1
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.2	U
Propanoic acid, 2-(2,4,5-tri	.1	U
2,4,5-Trichlorophenoxyacetic	.1	U

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Attn: Cindy Capannari
C/O ASI Inc.
10845 Hamilton Cleves Road
Ross, OH 45061

Date: November 16, 1989

Page 1 of 3

Job Number: ITNT 35611

P.O Number: Accounts Payable

This is the Certificate of Analysis for the following samples:

Client Project ID:	Fernald RI/FS	66584
Date Received by Lab:	09/14/89	66585 66587
Number of Samples:	Four (4)	
Sample Type:	Water	66586

I. INTRODUCTION

On September 14, 1989, four (4) water samples were received at ITAS-Oak Ridge Laboratory from Advanced Sciences Inc., Ross, Ohio. The list of analytical tests performed, as well as date of receipt and analysis can be found in the attached report.

Blanks are identified with client sample ID's starting with either "QX..B" or "QX...B". Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. ANALYTICAL RESULTS/METHODOLOGY

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

The samples were analyzed for TCL and additional Appendix IX semivolatiles organic compounds by gas chromatography/mass spectroscopy in accordance with the EPA CLP 2/88 Statement of Work. The samples were extracted at the IT-Mixed Waste Laboratory in Oak Ridge, Tennessee, and the analysis was performed at ITAS-Knoxville, Tennessee Laboratory, narrative submitted separately.

Reviewed and Approved

Snell A. Mills, III
Laboratory Manager
SAM/rdj

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

The samples were extracted for TCL and additional Appendix IX pesticide/PCB compounds (Isochin and Kepone) and analyzed by gas chromatography using the EPA CLP 10/86 Statement of Work.

The samples were extracted and analyzed for Appendix IX herbicide compounds at ITAS-Knoxville, Tennessee Laboratory by gas chromatography using EPA Method 8150 USEPA SW-846, 3rd Ed., 1986, narrative submitted separately.

The samples were analyzed for organophosphorus pesticide, at the ITAS-San Jose Laboratory, San Jose, California, Appendix IX compounds using EPA Method 8140, USEPA SW-846, 3rd Edition, 1986, to be submitted under separate cover.

III. QUALITY CONTROL

The pesticide and aroclor QC for these samples are referenced to ITNT 35609, sample number 66600, submitted separately.

The pesticide and aroclor analysis was performed on 09/26/89 and 09/27/89. All samples and blanks were prepped as low-level waters. Three (3) out of seven (7) water pesticide surrogate recovery was outside the QC required limit.

Organic data was reported with qualifiers as follows:

U - Compound analyzed for but not detected.
E - Compound exceeded calibration range of instrument.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below the contract required quantitation limit. The value given was an estimate.
B - Compound was found in the method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer intentatively identified compounds.

Advanced Sciences, Inc.
Date: November 16, 1989
Client Project ID: RI/FS Fernald

IT ANALYTICAL SERVICES
OAK RIDGE, TN

Job Number: ITNT 35611

SAMPLE SUMMARY TABLE

Field #	ITAS #	Matrix	Conc.	Analysis
66584	MM0133	WATER	LOW	BNA
	MM0137	WATER	LOW	PEST/PCB/HERB
	MM0141	WATER	LOW	OP PEST
66585	MM0134	WATER	LOW	BNA
	MM0138	WATER	LOW	PEST/PCB/HERB
	MM0142	WATER	LOW	OP PEST
66586	MM0135	WATER	LOW	BNA
	MM0139	WATER	LOW	PEST/PCB/HERB
	MM0143	WATER	LOW	OP PEST
66587	MM0136	WATER	LOW	BNA
	MM0140	WATER	LOW	PEST/PCB/HERB
	MM0144	WATER	LOW	OP PEST

ABBREVIATIONS:
BNA - Base-Neutral Acid Extractions
PEST - Pesticides
PCB - Polychlorinated Biphenyl
HERB - Herbicides
OP - Organophosphorus

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

* - Values outside of contract required QC limits.

Advanced Sciences. Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66584

Sample Date: N/A
IT Sample ID: MM0137
Prep Date: 09/15/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909151
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4,4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4,4'-DDD	.1	U
Endosulfan sulfate	.1	U
4,4'-DDT	.1	U
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	.1	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66585

Sample Date: N/A
IT Sample ID: MM0138
Prep Date: 09/15/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909151
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4,4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4,4'-DDD	.1	U
Endosulfan sulfate	.1	U
4,4'-DDT	.1	U
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	.1	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: [illegible]

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 7[illegible]

Client Sample ID: 66585DL

Sample Date: N/A
IT Sample ID: MM0138-20
Prep Date: 09/15/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXG19B909151
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	1	U
beta-BHC	1	U
delta-BHC	1	U
gamma-BHC (Lindane)	1	U
Heptachlor	1	U
Aldrin	1	U
Heptachlor epoxide	1	U
Endosulfan-I	1	U
Dieldrin	2	U
4,4'-DDE	2	U
Endrin	2	U
Endosulfan II	2	U
4,4'-DDD	2	U
Endosulfan sulfate	2	U
4,4'-DDT	2	U
Methoxychlor	10	U
Endrin ketone	2	U
alpha-Chlordane	10	U
gamma-Chlordane	10	U
Toxaphene	20	U
Aroclor-1016	10	U
Aroclor-1221	10	U
Aroclor-1232	10	U
Aroclor-1242	10	U
Aroclor-1248	10	U
Aroclor-1254	20	U
Aroclor-1260	20	U
Isodrin	1	U
Kepone	2	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT[illegible]

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66586

Sample Date: N/A
IT Sample ID: MM0139
Prep Date: 09/15/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909151
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4.4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4.4'-DDD	.1	U
Endosulfan sulfate	.1	U
4.4'-DDT	.1	U
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	.1	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66587

Sample Date: N/A
IT Sample ID: MM0140
Prep Date: 09/15/89
Analysis Date: (Completed) 09/26/89
Blank Sample ID: QXG19B909151
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4,4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4,4'-DDD	.1	U
Endosulfan sulfate	.1	U
4,4'-DDT	1.4	XU
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	.1	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number [illegible]

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66587DL

Sample Date: N/A
IT Sample ID: MM0140-5
Prep Date: 09/15/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXG19B909151
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.25	U
beta-BHC	.25	U
delta-BHC	.25	U
gamma-BHC (Lindane)	.25	U
Heptachlor	.25	U
Aldrin	.25	U
Heptachlor epoxide	.25	U
Endosulfan-I	.25	U
Dieldrin	.5	U
4,4'-DDE	.5	U
Endrin	.5	U
Endosulfan II	.5	U
4,4'-DDD	.5	U
Endosulfan sulfate	.5	U
4,4'-DDT	.5	U
Methoxychlor	2.5	U
Endrin ketone	.5	U
alpha-Chlordane	2.5	U
gamma-Chlordane	2.5	U
Toxaphene	5	U
Aroclor-1016	2.5	U
Aroclor-1221	2.5	U
Aroclor-1232	2.5	U
Aroclor-1242	2.5	U
Aroclor-1248	2.5	U
Aroclor-1254	5	U
Aroclor-1260	5	U
Isodrin	.25	U
Kepone	.5	U

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
1550 Bear Creek Road
Oak Ridge, TN 37830
ATTN: Mary Hall

November 14, 1989

Job Number: ITNT 44167 (ITNT 35611)

P.O. Number: 464085.01

This is the Certificate of Analysis for the following samples:

Client Project ID:	Fernald
Date Received by Lab:	09/15/89
Number of Samples:	Four (4)
Sample Type:	Water

I. Introduction

On 09/15/89, four (4) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from the IT Mixed Waste Laboratory for the Fernald project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical result before it is reported.

The samples were analyzed for Appendix IX Chlorophenoxy Herbicides by gas chromatography/electron capture detection (GC-ECD) based on SW-846 method 8150.

III. Quality Control

The samples were extracted for Appendix IX Chlorophenoxy Herbicides on 09/18/89 and analyzed on 09/25/89. No problems were encountered. Spiked blank samples were analyzed with ITAS project BRL 44151. Copies of the QC data are included.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

IT Corporation
November 16, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT 44167
(ITNT 35611)

TABLE 1

SAMPLE SUMMARY TABLE

Field #	ITAS #	ITAS Knoxville #	Matrix
66584	MM0137	JJ6143	Water
66585	MM0137	JJ6144	Water
66586	MM0139	JJ6145	Water
66587	MM0140	JJ6146	Water

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Advanced Sciences, Inc.
Date: 05-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

RCRA/Appendix IX/Water Supply Herbicides - SM 509B/EPA SW846-8150 - GC 754

Client Sample ID: QG10B90918D2

Sample Date: N/A
IT Sample ID: BL4804
Prep Date: 09/18/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QG10B90918D2
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.2	U
Propanoic acid, 2-(2,4,5-tri	.1	U
2,4,5-Trichlorophenoxyacetic	.1	U

Client Sample ID: 66584

Sample Date: N/A
IT Sample ID: JJ6143
Prep Date: 09/18/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QG10B90918D2
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.2	U
Propanoic acid, 2-(2,4,5-tri	.1	U
2,4,5-Trichlorophenoxyacetic	.1	U

Advanced Sciences, Inc.
Date: 05-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

RCRA/Appendix IX/Water Supply Herbicides - SM 509B/EPA SW846-8150 - GC 754

Client Sample ID: 66585

Sample Date: N/A
IT Sample ID: JJ6144
Prep Date: 09/18/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QG10B90918D2
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.2	U
Propanoic acid, 2-(2,4,5-tri	.1	U
2,4,5-Trichlorophenoxyacetic	.1	U

Client Sample ID: 66586

Sample Date: N/A
IT Sample ID: JJ6145
Prep Date: 09/18/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QG10B90918D2
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.2	U
Propanoic acid, 2-(2,4,5-tri	.1	U
2,4,5-Trichlorophenoxyacetic	.1	U

Advanced Sciences, Inc.
Date: 05-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

RCRA/Appendix IX/Water Supply Herbicides - SM 509B/EPA SW846-8150 - GC 754

Client Sample ID: 66587

Sample Date: N/A
IT Sample ID: JJ6146
Prep Date: 09/18/89
Analysis Date: (Completed) 09/25/89
Blank Sample ID: QG10B90918D2
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.2	U
Propanoic acid, 2-(2,4,5-tri	.1	U
2,4,5-Trichlorophenoxyacetic	.1	U

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
P.O. Box 549
Oak Ridge, TN 37831
ATTN: Mary Hall

November 16, 1989

Job Number: ITNT 44219 (ITNT 35611)

P.O. Number: 464085.01

This is the Certificate of Analysis for the following samples:

Client Project ID:	Fernald RI/FS
Date Received by Lab:	09/26/89
Number of Samples:	Four (4)
Sample Type:	Water extracts

I. Introduction

On 09/26/89, four (4) water extracts arrived at the ITAS-Knoxville, Tennessee laboratory from the IT-Mixed Waste Laboratory in Oak Ridge, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all CLP data are not blank corrected. Table 1 lists field and ITAS numbers, sample matrix and analysis requested.

The samples were analyzed for Target Compound List (TCL) and additional Appendix IX semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 2/88 Statement of Work.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

IT Corporation
November 16, 1989

Client Project ID: Fernald RI/FS

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNT 44219
(ITNT 35611)

III. Quality Control

The semivolatiles analyses were performed on 09/27 and 09/28/89 by direct injection of sample extract on a Restek RTX-5 capillary column on a Finnigan 4500 GC/MS/DS. The sample runs went well. TCL analytes were standardized for by the usual CLP protocol. After running daily one-point standards for the non-TCL analytes, it was decided to run 5 point calibrations for those compounds as well, under the same conditions as the sample runs. The daily standard responses were compared to those of the calibrations and reported in a format similar to CLP continuing calibration listings. All analytes were standardized for; hexachlorophene required an additional 3-point (on 10/02/89) because of its low response. The non-TCL calibration standards were designated with A9, AC, and H (for hexachlorophene) suffixes. All standard data were included in the final package. The quantitation limits reported were based on CLP protocol, previous studies, and present standard data. There were no problems seen in final review of the data.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected.
E - Compound exceeded calibration range of instrument.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below the contract required detection limit. The value given was an estimate.
B - Compound was found in the method blank.

IT Corporation
November 16, 1989

Client Project ID: Fernald RI/FS

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNT 44219
(ITNT 35611)

TABLE I

SAMPLE SUMMARY TABLE

Field #	ITAS #	Matrix	Analysis
66584	MM0133	Water	BNA
66585	MM0134	Water	BNA
66586	MM0135	Water	BNA
66587	MM0136	Water	BNA
SBLK1	Q1453	Water	MB-BNA

Abbreviations: BNA = Semivolatiles
MB = Method Blank

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66584

Sample Date: N/A
IT Sample ID: MM0133
Prep Date: 09/15/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	2	BJ
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	3	J
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66584

Sample Date: N/A
IT Sample ID: MM0133
Prep Date: 09/15/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66585

Sample Date: N/A
IT Sample ID: MM0134
Prep Date: 09/15/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	2	J	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	3	BJ
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	2	J
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66585

Sample Date: N/A
IT Sample ID: MM0134
Prep Date: 09/15/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66586

Sample Date: N/A
IT Sample ID: MM0135
Prep Date: 09/15/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	10	U
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	15	
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66586

Sample Date: N/A
IT Sample ID: MM0135
Prep Date: 09/15/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences. Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66587

Sample Date: N/A
IT Sample ID: MM0136
Prep Date: 09/15/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	10	U
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	3	J
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

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Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35611

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66587

Sample Date: N/A
IT Sample ID: MM0136
Prep Date: 09/15/89
Analysis Date: (Completed) 09/28/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Attn: Cindy Capannari
C/O ASI Inc.
10845 Hamilton Cleves Road
Ross, OH 45061

Date: November 15, 1989

Page: 1 of 3

Job Number: ITNT 35612

P.O Number: Accounts Payable

This is the Certificate of Analysis for the following:

66588
66589

Client Project ID: FMPC RI/FS
Date Received by Lab: 09/15/89
Number of Samples: Two (2)
Sample Type: Water

I. INTRODUCTION

On September 15, 1989, two (2) water samples were received at ITAS-Oak Ridge Lab from Advanced Sciences Inc., Ross, Ohio. The list of analytical tests performed, as well as date of receipt and analysis can be found in the attached report.

Blanks are identified with client sample ID's starting with either "QX..B" or "QX...B.". Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. ANALYTICAL RESULTS/METHODOLOGY

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

Reviewed and Approved

Snell A. Mills III
Laboratory Manager

SAM/rdj

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories

II. ANALYTICAL RESULTS/METHODOLOGY (Continued)

The sample (66588) was extracted for semivolatiles at ITAS-Oak Ridge using the EPA CLP 2/88 Statement of Work. The extracts were analyzed at ITAS-Knoxville for the Target Compound List (TCL) and additional Appendix IX compounds by gas chromatography/mass spectroscopy (GC/MS) in with the EPA CLP 2/88 Statement of Work, narrative is submitted separately.

The sample (66588) was extracted and analyzed for the chlorinated pesticide/PCB, Target Compound List (TCL) and additional Appendix IX compounds by gas Chromatography (GC) using the EPA CLP 10/86 Statement of Work.

The sample (66588) was extracted and analyzed for chlorinated herbicide Appendix IX compounds by gas chromatography (GC) using method 8150, USEPA SW-846, 3rd edition, 1986.

The samples were analyzed for organophosphorus pesticides at ITAS-San Jose Laboratory, San Jose, California and the narrative will be submitted separately.

III. QUALITY CONTROL

The pesticide and Aroclor sample was extracted on 09/15/89 and analyzed on 09/27/89. Isodrin and kepone were added to the CLP analysis to satisfy Appendix IX requirements. All samples and blank were prepped as low-level waters. Two (2) out of two (2) water pesticide surrogate recoveries are within the Q.C. required limits. The MS/MSD analyses were performed on sample 66600, (Job Number: ITNT 35609, to be reported separately).

The herbicide sample was extracted on 09/20/89 and analyzed on 10/11/89, no confirmation run was needed for this analysis. All herbicide samples and blanks were prepped by Method 8150, USEPA SW-846. The MS/MSD analyses were performed on sample 66600, (Job Number: ITNT 36509, to be reported separately).

Organic data was reported with qualifiers as follows:

U - Compound analyzed for but not detected.
E - Compound exceeded calibration range of instrument.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below the contract required quantitation limit. The value given was an estimate.
B - Compound was found in the method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer intentatively identified compounds.

SAMPLE SUMARY TABLE

Field #	ITAS #	Matrix	Conc.	Analysis
66588	MM0145	WATER	LOW	BNA
	MM0146	WATER	LOW	PEST/PCB/HERB
	MM0147	WATER	LOW	OP PEST
66589	MM0148	WATER	LOW	OP PEST

Abbreviations: BNA - Base-Neutral Acid Extractions
PEST - Pesticide
OP - Organophosphorus

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

* - Values outside of contract required QC limits.

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35612

Appendix IX Chlorinated Pesticides - Modified Current CLP Protocol - GC 781

Client Sample ID: 66588

Sample Date: N/A
IT Sample ID: MM0146
Prep Date: 09/15/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXG19B909151
Concentration Units: UG/LITER

Parameter	Result	
alpha-BHC	.05	U
beta-BHC	.05	U
delta-BHC	.05	U
gamma-BHC (Lindane)	.05	U
Heptachlor	.05	U
Aldrin	.05	U
Heptachlor epoxide	.05	U
Endosulfan-I	.05	U
Dieldrin	.1	U
4.4'-DDE	.1	U
Endrin	.1	U
Endosulfan II	.1	U
4.4'-DDD	.1	U
Endosulfan sulfate	.1	U
4.4'-DDT	.1	U
Methoxychlor	.5	U
Endrin ketone	.1	U
alpha-Chlordane	.5	U
gamma-Chlordane	.5	U
Toxaphene	1	U
Aroclor-1016	.5	U
Aroclor-1221	.5	U
Aroclor-1232	.5	U
Aroclor-1242	.5	U
Aroclor-1248	.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U
Isodrin	.05	U
Kepone	.1	U

Advanced Sciences, Inc.
Date: 13-NOV-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number [illegible]

RCRA/Appendix IX/Water Supply Herbicides - SM 509B/EPA SW846-8150 - GC 754

Client Sample ID: 66588

Sample Date: N/A
IT Sample ID: MM0146
Prep Date: 09/20/89
Analysis Date: (Completed) 10/11/89
Blank Sample ID: QXG10B909201
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.05	U
Propanoic acid, 2-(2,4,5-tri	.025	U
2,4,5-Trichlorophenoxyacetic	5	U

Client Sample ID: QXG10B909201

Sample Date: N/A
IT Sample ID: QX1460
Prep Date: 09/20/89
Analysis Date: (Completed) 10/11/89
Blank Sample ID: QXG10B909201
Concentration Units: UG/LITER

Parameter	Result	
2,4-Dichlorophenoxyacetic ac	.05	U
Propanoic acid, 2-(2,4,5-tri	.025	U
2,4,5-Trichlorophenoxyacetic	5	U

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
P.O. Box 549
Oak Ridge, TN 37831
ATTN: Mary Hall

November 10, 1989

Job Number: ITNT 44219 (ITNT 35612)

P.O. Number: 464085.01

This is the Certificate of Analysis for the following sample:

Client Project ID:	Fernald RI/FS
Date Received by Lab:	09/26/89
Number of Samples:	One (1)
Sample Type:	Water extract

I. Introduction

On 09/26/89, one (1) water extract arrived at the ITAS-Knoxville, Tennessee laboratory from the IT-Mixed Waste Laboratory in Oak Ridge, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all CLP data are not blank corrected. Table 1 lists field and ITAS numbers, sample matrix and analysis requested.

The sample was analyzed for Target Compound List (TCL) and additional Appendix IX semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 2/88 Statement of Work.

Reviewed and Approved:

Alyce Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

IT Corporation
November 10, 1989

Client Project ID: Fernald RI/FS

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNT 44219
(ITNT 35612)

III. Quality Control

The semivolatiles analyses were performed on 09/27/89 by direct injection of sample extract on a Restek RTX-5 capillary column on a Finnigan 4500 GC/MS/DS. The sample and related runs went well. There was one low surrogate recovery, but it was not so errant as to affect the overall compliance of the sample. All Appendix IX analytes were evaluated against daily standards, and all standards were checked against 5 point calibrations. This included non-TCL Appendix IX analytes, for which 5 point calibrations were run after the sample runs, but under the same conditions. The daily standards for these compounds were compared with the averages from the calibration standards (designated with AC, A9, or H suffixes), and presented in the same format as for CLP TCL continuing calibrations. TCL compounds were standardized for and reported according to routine CLP protocol. All standards (except for hexachlorophene, which required additional standardization on 11/02/89) showed good response with the method. The quantitation limits listed were based on standard results, CLP protocol, and data from previous studies. There were no other problems seen in final review of the data.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected.
E - Compound exceeded calibration range of instrument.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below the contract required detection limit. The value given was an estimate.
B - Compound was found in the method blank.

IT Corporation
November 10, 1989

Client Project ID: Fernald RI/FS

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNT 44219
(ITNT 35612)

TABLE I

SAMPLE SUMMARY TABLE

Field #	ITAS #	Matrix	Analysis
66588	MM0145	Water	BNA
SBLK1	Q1453	Water	MB-BNA

Abbreviations: BNA = Semivolatiles
MB = Method Blank

"CONCENTRATION UNIT" CODES

% MOISTURE	Percent Moisture Content
% RECOVERY	Percent Recovery of Known Spiked Compound
% SOLIDS	Percent Solids Content
COLONIES/100 ML	Colonies/100 milliliters (bacteriological concentration)
MG/KG	Milligrams per Kilogram (ppm)
MG/LITER	Milligrams per Liter (ppm)
UG/KG	Microgram per Kilogram (ppb)
UG/LITER	Microgram per Liter (ppb)
STANDARD UNITS	Standard pH Units
UMHOS/CM	Micromhos per Centimeter (conductivity concentration)
PCI/LITER	picoCuries/Liter (radiological concentration)
PCI/G	picoCuries/Gram (radiological concentration)
TOTAL MG	Total Milligrams
MG/M3	Milligrams per Cubic Meter
STD	Standard Deviation
RPD	Relative Percent Difference
UL/LITER	Microliters per Liter (ppb)
COLONIES/50 ML	Colonies/50 Milliliters (bacteriological concentration)
MMPY	Millimeters per Year
F	Degrees F
NG/G	Nanograms per Gram (ppb)

EDT SUFFIX CODES FOR "LAB SAMPLE" AND "CLIENT SAMPLE" NUMBERS

MS	Matrix Spike (sample spiked before prep)
MSD	Matrix Spike Duplicate (duplicate prep/analysis of spiked sample)
D	Duplicate (duplicate prep/analysis of a sample--could also have a D1, D2, etc.)
S	Spike (spiked before prep)
SD	Spike Duplicate (duplicate prep/analysis of a spiked sample)
S1	Original Spike (same as S--only used if there is an S2)
S2	Post Digestion Spike (original sample spiked after prep)
R	Reprepped (could be combined with other suffix codes, i.e. RMS, RD or could also have a R1, R2, etc.)
A	Replicate Analysis (additional analysis of original prepped sample--could also have a A1, A2, etc.)
U	Unfiltered Sample (unfiltered sample prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. UMS, UMSD, UD, etc.)
F	Filtered Sample (sample filtered before prep/analysis--used when client sample number is the same for both unfiltered and filtered samples--could be combined with other suffix codes, i.e. FMS, FMSD, FD, etc.)
BK	Back sorbent section of sampler tube
FR	Front sorbent section of sampler tube
DL	Dilution (original sample diluted for analysis)

edt1.jes

Table EDT-4

EPA CLP ORGANIC QUALIFIERS/RECOVERY FLAGS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Estimated value due to a confirmed compound which is off-scale in both columns.

Y - Indistinguishable isomer in tentatively identified compounds.

Z - No estimated value reported, or an elevated CRQL reported because matrix effects interfere with or obscure the compound on one or both columns. In either situation, the compound does not confirm as a positive identification.

* - Values outside of contract required QC limits.

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35612

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: QXM12B909151

Sample Date: N/A
IT Sample ID: QX1453
Prep Date: 09/15/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
Pentachloronitrobenzene	20	U	3-Nitroaniline	50	U
Diallate	10	U	Acenaphthene	10	U
Phenol	10	U	2,4-Dinitrophenol	50	U
bis(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	2	J
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35612

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: QXM12B909151

Sample Date: N/A
IT Sample ID: QX1453
Prep Date: 09/15/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35612

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66588

Sample Date: N/A
IT Sample ID: MM0145
Prep Date: 09/15/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
[illegible]achloronitrobenzene	20	U	3-Nitroaniline	50	U
	10	U	Acenaphthene	10	U
	10	U	2,4-Dinitrophenol	50	U
[illegible]3(2-Chloroethyl)ether	10	U	4-Nitrophenol	50	U
2-Chlorophenol	10	U	Dibenzofuran	10	U
1,3-Dichlorobenzene	10	U	2,4-Dinitrotoluene	10	U
1,4-Dichlorobenzene	10	U	Diethyl phthalate	10	U
Benzyl alcohol	10	U	4-Chlorophenylphenyl ether	10	U
1,2-Dichlorobenzene	10	U	Fluorene	10	U
2-Methylphenol	10	U	4-Nitroaniline	50	U
bis(2-Chloroisopropyl)ether	10	U	4,6-Dinitro-2-methylphenol	50	U
4-Methylphenol	10	U	N-Nitrosodiphenylamine	3	BJ
N-Nitroso-di-n-propylamine	10	U	4-Bromophenyl phenyl ether	10	U
Hexachloroethane	10	U	Hexachlorobenzene	10	U
Nitrobenzene	10	U	Pentachlorophenol	50	U
Isophorone	10	U	Phenanthrene	10	U
2-Nitrophenol	10	U	Anthracene	10	U
2,4-Dimethylphenol	10	U	Di-n-butyl phthalate	10	U
bis(2-Chloroethoxy)methane	10	U	Fluoranthene	10	U
2,4-Dichlorophenol	10	U	Pyrene	10	U
1,2,4-Trichlorobenzene	10	U	Butyl benzyl phthalate	10	U
Naphthalene	10	U	3,3'-Dichlorobenzidine	20	U
4-Chloroaniline	10	U	Benzo(a)anthracene	10	U
Hexachlorobutadiene	10	U	Chrysene	10	U
4-Chloro-3-methylphenol	10	U	bis(2-Ethylhexyl) phthalate	10	U
2-Methylnaphthalene	10	U	Di-n-octyl phthalate	10	U
Hexachlorocyclopentadiene	10	U	Benzo(b)fluoranthene	10	U
2,4,6-Trichlorophenol	10	U	Benzo(k)fluoranthene	10	U
2,4,5-Trichlorophenol	50	U	Benzo(a)pyrene	10	U
2-Chloronaphthalene	10	U	Indeno(1,2,3-cd)pyrene	10	U
2-Nitroaniline	50	U	Dibenzo(a,h)anthracene	10	U
Dimethyl phthalate	10	U	Benzo(g,h,i)perylene	10	U
Acenaphthylene	10	U	N-Nitrosodimethylamine	10	U
2,6-Dinitrotoluene	10	U	2-Picoline	70	U

Advanced Sciences, Inc.
Date: 12-DEC-89

IT CORPORATION
KNOXVILLE, TN

Client Project ID: Fernald RI/FS

Job Number: ITNT35612

Appendix IX Base/Neutral/Acid Compounds - Modified Current EPA CLP Protocol - ME 723

Client Sample ID: 66588

Sample Date: N/A
IT Sample ID: MM0145
Prep Date: 09/15/89
Analysis Date: (Completed) 09/27/89
Blank Sample ID: QXM12B909151
Concentration Units: UG/LITER

Parameter	Result		Parameter	Result	
N-Nitrosomethylethylamine	10	U	4-Nitroquinoline-1-oxide	10	U
Methyl methanesulfonate	10	U	Methapyrilene	40	U
N-Nitrosodiethylamine	10	U	Aramite	10	U
Ethyl methanesulfonate	10	U	p-Dimethylaminoazobenzene	30	U
Aniline	10	U	3,3'-Dimethylbenzidine	80	U
Pentachloroethane	20	U	2-Acetylaminofluorene	10	U
3-Methylphenol	10	U	7,12-Dimethylbenz(a)anthrace	20	U
N-Nitrosopyrrolidine	10	U	Hexachlorophene	500	U
Acetophenone	10	U	3-Methylcholanthrene	30	U
N-Nitrosomorpholine	10	U			
o-Toluidine	10	U			
N-Nitrosopiperidine	10	U			
O,O,O-Triethylphosphorothioa	10	U			
2,6-Dichlorophenol	10	U			
Hexachloropropene	20	U			
a,a-Dimethylphenethylamine	10	U			
N-Nitrosodi-n-butylamine	20	U			
p-Phenylenediamine	50	U			
Safrole	10	U			
1,2,4,5-Tetrachlorobenzene	10	U			
Isosafrole	10	U			
1,4-Naphthoquinone	10	U			
m-Dinitrobenzene	10	U			
Pentachlorobenzene	20	U			
2-Naphthylamine	170	U			
1-Naphthylamine	120	U			
2,3,4,6-Tetrachlorophenol	10	U			
5-Nitro-o-toluidine	20	U			
Diphenylamine	10	U			
sym-Trinitrobenzene	10	U			
Phenacetin	10	U			
4-Aminobiphenyl	50	U			
Pronamide	30	U			
Dinoseb	20	U			

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Received: 08/15/89 09/11/89 14:46:52

REPORT TO
ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

ATTEN CINDY DANIELS

PREPARED BY
IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

ATTEN ERS
PHONE 615-482-9707

CERTIFIED BY James Harvey

CONTACT JIM HARVEY

CLIENT RI FS FER SAMPLES 5
COMPANY ADVANCED SCIENCES, INC.
FACILITY 10845 HAMILTON CLEVES ROAD

WORK ID GROUNDWATER SAMPLES-WMCO RCRA
TAKEN
TRANS
TYPE
P.O. # 866A21602-04 602.09.25
INVOICE under separate cover

SAMPLE IDENTIFICATION

01	66495
02	66521
03	66496
04	66490
05	66516

TEST CODES and NAMES used on this report

SPEC	SPECIAL FORM FOR REPORTING
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOTL	URANIUM TOTAL

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-079

SAMPLE ID 66495 FRACTION Q1A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/13/89 Category 44979

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	4	1	ug/l
U-234	1.7	0.3	pci/l
U-235	<1.0		pci/l
U-238	1.3	0.3	pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TC-99	<30.0		pci/l

SAMPLE ID 66521 FRACTION Q2A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/13/89 Category 44979

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TC-99	<30.0		pci/l

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Received: 08/15/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-079

SAMPLE ID 66496 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/13/89 Category 44980

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	43	9	ug/l
TC-99	<30.0		pci/l
U-234	11.3	1.6	pci/l
U-235	<1.0		pci/l
U-238	18.1	2.4	pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

SAMPLE ID 66490 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/13/89 Category 45391

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TC-99	<30.0		pci/l

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Received: 08/15/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-079

SAMPLE ID 66516 FRACTION 05A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/13/89 Category 44981

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	75	14	ug/l
TC-99	542	65	pci/l
U-234	10.9	1.9	pci/l
U-235	<1.0		pci/l
U-238	36.1	5.1	pci/l
TH-228	4.3	0.9	pci/l
TH-230	2.9	0.7	pci/l

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Received: 08/14/89 09/11/89 14:46:30

REPORT TO
ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

ATTEN CINDY DANIELS

PREPARED BY
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1550 BEAR CREEK ROAD
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CERTIFIED BY James Harvey
CONTACT JIM HARVEY

CLIENT RI FS FER SAMPLES 6
COMPANY ADVANCED SCIENCES, INC.
FACILITY 10845 HAMILTON CLEVES ROAD

WORK ID GROUNDWATER SAMPLES-HMCO RCRA
TAKEN
TRANS
TYPE
P.O. # 866A21602-04 602.09.25
INVOICE under separate cover

SAMPLE IDENTIFICATION

01	66497
02	66506
03	66507
04	66508
05	66515
06	66520

TEST CODES and NAMES used on this report

SPEC	SPECIAL FORM FOR REPORTING
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOT	U-TOTAL

SAMPLE ID 66497 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/10/89 Category 44956

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	12	2	ug/l
TC-99	<30.0		pci/l
U-234	4.4	0.7	pci/l
U-235	<1.0		pci/l
U-238	4.7	0.8	pci/l
TH-228	6.2	1.1	pci/l
TH-230	5.9	1.0	pci/l

SAMPLE ID 66506 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/11/89 Category 44961

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TC-99	<30.0		pci/l

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Received: 08/14/89 Results by Sample

SAMPLE ID 66507 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/11/89 Category 44962

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	10	2	ug/l
U-234	3.8		pci/l
U-235	<1.0		pci/l
U-238	4.3		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TC-99	<30.0		pci/l

SAMPLE ID 66508 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/11/89 Category 44963

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	5	1	ug/l
TC-99	<30.0		pci/l
U-234	1.8	0.4	pci/l
U-235	<1.0		pci/l
U-238	1.8	0.4	pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-069

SAMPLE ID 66515 FRACTION 05A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/10/89 Category 44958

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TC-99	<30.0		pci/l

SAMPLE ID 66520 FRACTION 06A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/10/89 Category 44958

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TC-99	<30.0		pci/l

Page 1 ITRSL Oak Ridge REPORT Work Order # R9-08-065
Received: 08/11/89 09/11/89 14:46:09

REPORT TO
ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

ATTEN CINDY DANIELS

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CERTIFIED BY

ATTEN ERS
PHONE 615-482-9707

CONTACT JIM HARVEY

CLIENT RI FS FER SAMPLES 4
COMPANY ADVANCED SCIENCES, INC.
FACILITY 10845 HAMILTON CLEVES ROAD

WORK ID GROUND WATER SAMPLES
TAKEN
TRANS
TYPE
P.O. # 866A21602-04 602.09.25
INVOICE under separate cover

SAMPLE IDENTIFICATION

01	66498
02	66519
03	66499
04	66510

TEST CODES and NAMES used on this report

SPEC	SPECIAL FORM FOR REPORTING
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOT	U-TOTAL

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Received: 08/11/89 Results by Sample

SAMPLE ID 66498 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/09/89 Category 44943

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	2	1	ug/l
U-234	<1.0		pci/l
U-235/236	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	1.1	0.4	pci/l
TH-230	<1.0		pci/l
TH-232	<1.0		pci/l
TC-99	<30.0		pci/l

SAMPLE ID 66519 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/09/89 Category 44943

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
U-234	<1.0		pci/l
U-235/236	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TH-232	<1.0		pci/l
TC-99	<30.0		pci/l

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Received: 08/11/89 Results by Sample

SAMPLE ID 66499 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/09/89 Category 44941

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
U-234	<1.0		pci/l
U-235/236	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TH-232	<1.0		pci/l
TC-99	<30.0		pci/l

SAMPLE ID 66510 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/09/89 Category 44942

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
U-234	<1.0		pci/l
U-235/236	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TH-232	<1.0		pci/l
TC-99	<30.0		pci/l

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REPORT TO
ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

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ATTEN ERS
PHONE 615-482-9707

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CLIENT RI FS FER SAMPLES 8
COMPANY ADVANCED SCIENCES, INC.
FACILITY 10845 HAMILTON CLEVES ROAD

WORK ID GROUNDWATER SAMPLES-WMCO RCRA
TAKEN
TRANS
TYPE
P.O. # 866A21602-04 602.09.25
INVOICE under separate cover

SAMPLE IDENTIFICATION

01	66500
02	66501
03	66502
04	66511
05	66512
06	66525
07	66526
08	66527

TEST CODES and NAMES used on this report

SPEC	SPECIAL FORM FOR REPORTING
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOT	U-TOTAL

SAMPLE ID 66500 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/16/89 Category 44957

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	25	5	ug/l
TC-99	<30.0		pci/l
U-234	7.8	1.1	pci/l
U-235	<1.0		pci/l
U-238	5.5	0.8	pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

SAMPLE ID 66501 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/16/89 Category 45399

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pci/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

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Received: 08/18/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-096

SAMPLE ID 66502 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/17/89 Category 45398

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	2	1	ug/l
TC-99	2853	294	pci/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

SAMPLE ID 66511 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/17/89 Category 44972

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	3	1	ug/l
TC-99	<30.0		pci/l
U-234	1.2	0.4	pci/l
U-235	<1.0		pci/l
U-238	1.4	0.4	pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

SAMPLE ID 66512 FRACTION 05A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/17/89 Category 45394

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pci/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

SAMPLE ID 66525 FRACTION 06A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/16/89 Category 45393

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	15	2	ug/l
TC-99	<30.0		pci/l
U-234	6.8	1.1	pci/l
U-235	<1.0		pci/l
U-238	5.4	0.9	pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-096

SAMPLE ID 66526 FRACTION 07A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/16/89 Category 44994

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pci/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

SAMPLE ID 66527 FRACTION 08A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/16/89 Category 44994

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pci/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

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Received: 08/16/89 09/29/89 18:16:23

REPORT TO
ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

ATTEN CINDY DANIELS

PREPARED BY
IT/RADIOLOGICAL SCIENCES LAB.
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CERTIFIED BY

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PHONE 615-482-9707

CONTACT JIM HARVEY

CLIENT RI FS FER SAMPLES 6
COMPANY ADVANCED SCIENCES, INC.
FACILITY 10845 HAMILTON CLEVES ROAD

WORK ID WMCO RCRA GROUNDWATER-TABLE 2
TAKEN
TRANS
TYPE
P.O. # 866A21602-04 602.09.25
INVOICE under separate cover

SAMPLE IDENTIFICATION

01	66503
02	66504
03	66505
04	66492
05	66517
06	66522

TEST CODES and NAMES used on this report

SPEC	SPECIAL FORM FOR REPORTING
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOT	U-TOTAL

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Received: 08/16/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-085

SAMPLE ID 66503 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/14/89 Category 44984

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	34	7	ug/l
TC-99	<30.0		pCi/l
U-234	11.2	1.5	pCi/l
U-235/236	<1.0		pCi/l
U-238	8.9	1.3	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

SAMPLE ID 66504 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/14/89 Category 44982

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	16	5	ug/l
TC-99	<30.0		pCi/l
U-234	5.7	0.8	pCi/l
U-235/236	<1.0		pCi/l
U-238	4.6	0.7	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

Page 3 ITRSL Oak Ridge REPORT Work Order # R9-08-085
Received: 08/16/89 Results by Sample

SAMPLE ID 66505 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/14/89 Category 44977

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

SAMPLE ID 66492 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/13/89 Category 44977

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	70	13	ug/l
TC-99	63	32	pCi/l
U-234	13.3	1.9	pCi/l
U-235/236	<1.0		pCi/l
U-238	34.3	4.3	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

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Received: 08/16/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-085

SAMPLE ID 66517 FRACTION 05A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/14/89 Category 44983

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	12	3	ug/l
TC-99	<30.0		pCi/l
U-234	6.6	1.0	pCi/l
U-235/236	<1.0		pCi/l
U-238	4.8	0.8	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

SAMPLE ID 66522 FRACTION 06A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/14/89 Category 44983

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

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Received: 08/10/89

ITRSL Oak Ridge REPORT
09/11/89 14:45:55

Work Order # R9-08-060

REPORT TO
ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

ATTEN CINDY DANIELS

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IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

ATTEN ERS
PHONE 615-482-9707

CERTIFIED BY James Harvey

CONTACT JIM HARVEY

CLIENT RI FS FER SAMPLES 2
COMPANY ADVANCED SCIENCES, INC.
FACILITY 10845 HAMILTON CLEVES ROAD

WORK ID MMCO RCRA GROUNDWATER-TABLE 2
TAKEN
TRANS
TYPE
P.O. # B66A21602-04 602.09.25
INVOICE under separate cover

SAMPLE IDENTIFICATION
01 66509
02 66518

TEST CODES and NAMES used on this report

SPEC	SPECIAL FORM FOR REPORTING
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOT	U-TOTAL

ITRSL Oak Ridge REPORT Work Order # R9-08-060
Results by Sample

SAMPLE ID 66509 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/08/89 Category 44955

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TC-99	<30.0		pci/l

SAMPLE ID 66518 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/08/89 Category 44955

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l
TC-99	<30.0		pci/l

Page 1 ITRSL Oak Ridge REPORT Work Order # R9-08-090
Received 08/17/89 09/11/89 14:47:13

REPORT TO: ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

ATTEN: CINDY DANIELS

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

ATTEN: ERS
PHONE: 615-482-9707

CERTIFIED BY: James Harvey
CONTACT: JIM HARVEY

CLIENT: RI FS FER SAMPLES: 4
COMPANY: ADVANCED SCIENCES, INC.
FACILITY: 10845 HAMILTON CLEVES ROAD

WORK ID: GROUNDWATER SAMPLES-WMCO RCRA
TAKEN:
TRANS:
TYPE:
P.O. #: B66A21602-04 602.09.25
INVOICE: under separate cover

SAMPLE IDENTIFICATION.

01	66513
02	66514
03	66523
04	66524

TEST CODES and NAMES used on this report

SPEC	SPECIAL FORM FOR REPORTING
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOTL	URANIUM TOTAL

SAMPLE ID 66513 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/15/89 Category 44951

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pci/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

SAMPLE ID 66514 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/15/89 Category 45392

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pci/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

Page 3 ITRSL Oak Ridge REPORT Work Order # R9-08-090
Received: 08/17/89 Results by Sample

SAMPLE ID 66523 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/15/89 Category 44987

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pci/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

SAMPLE ID 66524 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/15/89 Category 44987

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pci/l
U-234	<1.0		pci/l
U-235	<1.0		pci/l
U-238	<1.0		pci/l
TH-228	<1.0		pci/l
TH-230	<1.0		pci/l

Page 1 ITRSL Oak Ridge REPORT Work Order # R9-09-039
Received: 09/09/89 09/30/89 11:09:37

REPORT TO
ADVANCED SCIENCES, INC.
P.O. BOX 479
ROSS, OH 45061-0479

ATTEN CINDY DANIELS

PREPARED BY
IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

CERTIFIED BY

ATTEN ERS
PHONE 615-482-9707

CONTACT JIM HARVEY

CLIENT RI FS FER SAMPLES 4
COMPANY ADVANCED SCIENCES, INC.
FACILITY 10845 HAMILTON CLEVES ROAD

WORK ID WMCO RCRA GROUNDWATER-TABLE 2
TAKEN
TRANS
TYPE
P.O. # 866A21602-04 602.09.25
INVOICE under separate cover

SAMPLE IDENTIFICATION

01	66532
02	66557
03	66558
04	66553

TEST CODES and NAMES used on this report

ASIRPT	FORM FOR REPORTING DATA
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOTL	URANIUM TOTAL

Page 2 ITRSL Oak Ridge REPORT Work Order # R9-09-039
Received: 09/09/89 Results by Sample

SAMPLE ID 66532 : FRACTION 01A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 09/08/89 Category 40885

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	1.1	0.3	pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	2	1	ug/l

SAMPLE ID 66557 FRACTION 02A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 09/08/89 Category 40881

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	1.6	0.3	pCi/l
U-235/236	<1.0		pCi/l
U-238	5.0	0.7	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	15	2	ug/l

Page 3
Received: 09/09/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-09-039

SAMPLE ID 66558 FRACTION 03A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 09/08/89 Category 40882

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	2.3	0.5	pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	4	1	ug/l

SAMPLE ID 66553 FRACTION 04A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 09/08/89 Category 40882

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	<1		ug/l

Page 1 ITRSL Oak Ridge REPORT Work Order # R9-09-004
Received: 09/01/89 09/29/89 18:15:46

REPORT TO: ADVANCED SCIENCES, INC.
P.O. BOX 479
ROSS, OH 45061-0479

ATTEN: CINDY DANIELS

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

CERTIFIED BY

ATTEN: ERS
PHONE: 615-482-9707

CONTACT: JIM HARVEY

CLIENT: RI FS FER SAMPLES: 5
COMPANY: ADVANCED SCIENCES, INC.
FACILITY: 10845 HAMILTON CLEVES ROAD

WORK ID: WMCO RCRA GROUNDWATER-TABLE 2
TAKEN:
TRANS:
TYPE:
P.O. #: 866A21602-04 602.09.25
INVOICE: under separate cover

SAMPLE IDENTIFICATION

01	66535
02	66542
03	66543
04	66552
05	66547

TEST CODES and NAMES used on this report

ASIRPT	FORM FOR REPORTING DATA
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOTL	URANIUM TOTAL

Page 2 ITRSL Oak Ridge REPORT Work Order # R9-09-004
Received: 09/01/89 Results by Sample

SAMPLE ID 66535 FRACTION 01A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 08/31/89 Category 40883

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	2.90	0.5	pCi/l
U-235/236	<1.0		pCi/l
U-238	1.70	0.4	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	4	1	ug/l

SAMPLE ID 66542 FRACTION 02A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 08/30/89 Category 40871

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	36.0	16.5	pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	<1		ug/l

Page 3 ITRSL Oak Ridge REPORT Work Order # R9-09-004
Received: 09/01/89 Results by Sample

SAMPLE ID 66543 FRACTION 03A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 08/30/89 Category 40819

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	<1		ug/l

SAMPLE ID 66552 FRACTION 04A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 08/30/89 Category 40819

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	<1		ug/l

Page 4 ITRSL Oak Ridge REPORT Work Order # R9-09-004
Received: 09/01/89 Results by Sample

SAMPLE ID 66347 FRACTION 05A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 08/30/89 Category 40869

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	<1		ug/l

Page 1 ITRSL Oak Ridge REPORT Work Order # R9-08-143
Received: 08/30/89 09/29/89 18:14:27

REPORT TO
ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

ATTEN CINDY DANIELS

PREPARED BY
IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

CERTIFIED BY

ATTEN ERS
PHONE 615-482-9707

CONTACT JIM HARVEY

CLIENT RI FS FER SAMPLES 4
COMPANY ADVANCED SCIENCES, INC.
FACILITY 10845 HAMILTON CLEVES ROAD

WORK ID WMCO RCRA GROUNDWATER-TABLE 2
TAKEN
TRANS
TYPE
P.O. # B66A21602-04 602.9.25
INVOICE under separate cover

SAMPLE IDENTIFICATION

01 66537
02 66538
03 66550
04 66548

TEST CODES and NAMES used on this report

SPEC	SPECIAL FORM FOR REPORTING
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOTW	URANIUM TOTAL

Page 2
Received: 08/30/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-143

SAMPLE ID 66537 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/28/89 Category 40814

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	1	1	ug/l
TC-99	2293	236	pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

SAMPLE ID 66538 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/28/89 Category 40812

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	56	9	ug/l
TC-99	<30.0		pCi/l
U-234	10.3	1.4	pCi/l
U-235/236	<1.0		pCi/l
U-238	20.8	2.6	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

SAMPLE ID 66550 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/28/89 Category 40812

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

SAMPLE ID 66548 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/28/89 Category 40817

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

Page 1 ITRSL Oak Ridge REPORT Work Order # R9-08-152
Received: 08/31/89 10/03/89 12:51:54

REPORT TO: ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

ATTEN: CINDY DANIELS

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

CERTIFIED BY

ATTEN: ERS
PHONE: 615-482-9707

CONTACT: JIM HARVEY

CLIENT: RI FS FER SAMPLES: 3
COMPANY: ADVANCED SCIENCES, INC.
FACILITY: 10845 HAMILTON CLEVES ROAD

WORK ID: WMCO RCRA GROUNDWATER-TABLE 2
TAKEN:
TRANS:
TYPE:
P.O. #: 866A21602-04 602.09.25
INVOICE: under separate cover

SAMPLE IDENTIFICATION

01	66545
02	66551
03	66544

TEST CODES and NAMES used on this report

SPEC	SPECIAL FORM FOR REPORTING
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOTL	URANIUM TOTAL

Page 2
Received: 08/31/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-152

SAMPLE ID 66545 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/29/89 Category 40805

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-TOTAL	25	4	ug/l
U-234	9.82	1.29	pCi/l
U-235/236	<1.0		pCi/l
U-238	8.48	1.14	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

SAMPLE ID 66551 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/29/89 Category 40805

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-TOTAL	<1.0		ug/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

Page 3
Received: 08/31/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-08-152

SAMPLE ID 66544 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 08/29/89 Category 40820

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-TOTAL	25	4	ug/l
U-234	10.1	1.36	pCi/l
U-235/236	<1.0		pCi/l
U-238	7.71	1.1	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l

Page 1 ITRSL Oak Ridge REPORT Work Order # R9-09-052
Received: 09/13/89 11/08/89 18:19:51

REPORT TO
ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

ATTEN CINDY DANIELS

PREPARED BY
IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

ATTEN ERS
PHONE 615-482-9707

CERTIFIED BY

CONTACT JIM DILLARD

CLIENT RI FS FER SAMPLES 1
COMPANY ADVANCED SCIENCES, INC.
FACILITY 10845 HAMILTON CLEVES ROAD

WORK ID WMCO RCRA GROUNDWATER-TABLE 2
TAKEN
TRANS
TYPE
P.O. # 866A21602-04 602.09.25
INVOICE under separate cover

SAMPLE IDENTIFICATION	TEST CODES and NAMES used on this report	
01 66555	ASIRPT	FORM FOR REPORTING DATA
	TC99	TC-99
	TH228	TH-228
	TH230	TH-230
	U234	U-234
	U235	U-235/236
	U238	U-238
	UTOTL	URANIUM TOTAL

Page 2
Received: 09/13/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-09-052

SAMPLE ID 66555

FRACTION 01A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 09/11/89 Category 40887

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
U-TOTAL	<1		ug/l
TC-99	<30.0		pCi/l
U-234	2.52	0.46	pCi/l
U-235/236	<1.0		pCi/l
U-238	1.97	0.39	pCi/l
TH-228	2.23	0.43	pCi/l
TH-230	<1.0		pCi/l
TH-232	<1.0		pCi/l

Page 1 ITRSL Oak Ridge REPORT Work Order # R9-09-046
Received: 09/12/89 09/29/89 18:15:10

REPORT TO: ADVANCED SCIENCES, INC.
P.O. BOX 475
ROSS, OH 45061-0475

ATTEN: CINDY DANIELS

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

CERTIFIED BY

ATTEN: ERS
PHONE: 615-482-9707

CONTACT: JIM HARVEY

CLIENT: RI FS FER SAMPLES: 4
COMPANY: ADVANCED SCIENCES, INC.
FACILITY: 10845 HAMILTON CLEVES ROAD

WORK ID: WMCO RCRA GROUNDWATER-TABLE 2
TAKEN:
TRANS:
TYPE:
P.O. #: 866A21602-04 602.09.25
INVOICE: under separate cover

SAMPLE IDENTIFICATION

01	66559
02	66580
03	66554
04	66581

TEST CODES and NAMES used on this report

ASIRPT	FORM FOR REPORTING DATA
TC99	TC-99
TH228	TH-228
TH230	TH-230
U234	U-234
U235	U-235/236
U238	U-238
UTOTL	URANIUM TOTAL

Page 2
Received: 09/12/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-09-046

SAMPLE ID 66559

FRACTION 01A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 09/11/89 Category 40899

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	33.5	5.4	pCi/l
U-235/236	3.7	1.1	pCi/l
U-238	154	22	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	467	64	ug/l

SAMPLE ID 66580

FRACTION 02A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 09/10/89 Category 40890

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	2.4	0.1	pCi/l
U-235/236	<1.0		pCi/l
U-238	4.7	0.7	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	20	3	ug/l

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-09-046

SAMPLE ID 66554 FRACTION 03A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 09/10/89 Category 40890

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	<1.0		pCi/l
U-235/236	<1.0		pCi/l
U-238	<1.0		pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	<1		ug/l

SAMPLE ID 66581 FRACTION 04A TEST CODE ASIRPT NAME FORM FOR REPORTING DATA
Date & Time Collected 09/10/89 Category 40905

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
TC-99	<30.0		pCi/l
U-234	7.9	1.1	pCi/l
U-235/236	<1.0		pCi/l
U-238	6.3	0.9	pCi/l
TH-228	<1.0		pCi/l
TH-230	<1.0		pCi/l
U-TOTAL	20	3	ug/l

APPENDIX V

November 1989 Sampling Round Laboratory Analysis Data Sheets

Cross Reference of Well Identification to Sample Identification
November, 1989
RCRA Assessment Sampling

Sample Number	Location
66651	1024
66653	1052
66657	1025
66659	1027
66663	1030
66665	1031
66667	1038
66671	1074
66673	1079
66675	1080
66677	1081
66679	1082
66681	1083
66683	2043
66685	3043
66687	2066
66689	3066
66691	2010
66693	3010
66695	4010
66697	2013
66699	3013
66701	4013
66703	2019
66705	3019
66707	2021
66709	2027
66711	2037
66713	3037
66715	2051
66717	3051
66719	2055
66721	3055
66723	2084
66725	3084
66727	3001
66729	4001
66731	3008
66733	4008
66735	3024
66737	4101
66739	4102
66741	4103
66743	2027
66745	1083
66747	1052
66749	2055
66751	4008

Cross Reference of Well Identification
to Sample Identification
November, 1989
RCRA Assessment Sampling

Sample Number	Location
66753	RINS
66755	RINS
66757	TRIP
66759	TRIP
66761	TRIP
66763	TRIP
66765	TRIP
66767	TRIP
66769	TRIP
66771	TRIP
66773	TRIP
66775	TRIP
66776	2027
66777	2043

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Dayton Division
3601 South Dixie Drive
Dayton, OH 45439
Tel (513) 294-6856
Fax (513) 294-7816

Formerly Howard Laboratories, Inc

ANALYTICAL REPORT

12-26-89

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

PAGE 1

Sample No.: 4239

Sample Description: #66687

Date Taken: 11-06-89 1115

Date Received: 11-08-89

Chloride	69	mg/L
Fluoride	1.02	mg/L
Nitrogen, Nitrate	0.03	mg/L
Phenols	0.018	mg/L
Sulfate	7	mg/L
Total Organic Carbon (TOC)	4	mg/L
Total Organic Halogens	13.9	ug/L Cl-
Aluminum	0.339	mg/L
Calcium	10.3	mg/L
Iron	2.10	mg/L
Magnesium	2.48	mg/L
Manganese	0.037	mg/L
Sodium	2.42	mg/L
Arsenic	0.014	mg/L
Barium	0.715	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.010	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

Jackie Webster
Jackie Webster
Division Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Dayton Division
3601 South Dixie Drive
Dayton, OH 45439
Tel (513) 294-6856
Fax: (513) 294-7816

Formerly Howard Laboratories, Inc.

ANALYTICAL REPORT

12-26-89

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

PAGE 2

Sample No.: 4239

Sample Description: #66687

Date Taken: 11-06-89 1115

Date Received: 11-08-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Jackie Webster
Division Manager

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Formerly: Howard Laboratories, Inc

ANALYTICAL REPORT

12-26-89

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

PAGE 3

Sample No.: 4240

Sample Description: #66689

Date Taken: 11-06-89 1430

Date Received: 11-08-89

Chloride	679	mg/L
Fluoride	0.15	mg/L
Nitrogen, Nitrate	0.05	mg/L
Phenols	0.068	mg/L
Sulfate	9	mg/L
Total Organic Carbon (TOC)	4.0	mg/L
Total Organic Halogens	11.2	ug/L Cl-
Aluminum	0.847	mg/L
Calcium	168	mg/L
Iron	19.6	mg/L
Magnesium	55.6	mg/L
Manganese	0.138	mg/L
Sodium	312	mg/L
Arsenic	0.101	mg/L
Barium	0.584	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.010	mg/L
Cobalt	<0.025	mg/L
Copper	0.028	mg/L
Lead	0.006	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.050	mg/L

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ANALYTICAL REPORT

12-26-89

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

PAGE 4

Sample No.: 4240

Sample Description: #66689

Date Taken: 11-06-89 1430

Date Received: 11-08-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

12-26-89

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

PAGE 5

Sample No.: 4241

Sample Description: #66715

Date Taken: 11-06-89 1630

Date Received: 11-08-89

Chloride	26	mg/L
Fluoride	0.28	mg/L
Nitrogen, Nitrate	0.03	mg/L
Phenols	0.013	mg/L
Sulfate	394	mg/L
Total Organic Carbon (TOC)	<1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	0.235	mg/L
Calcium	213	mg/L
Iron	5.22	mg/L
Magnesium	52.4	mg/L
Manganese	0.426	mg/L
Sodium	16.3	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.009	mg/L
Cobalt	<0.025	mg/L
Copper	0.027	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.051	mg/L

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ANALYTICAL REPORT

12-26-89

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

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Sample No.: 4241

Sample Description: #66715

Date Taken: 11-06-89 1630

Date Received: 11-08-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

12-29-89

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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PAGE 1

Sample No.: 4714

Sample Description: #66717

Date Taken: 11-09-89 945

Date Received: 11-09-89

Chloride	44	mg/L
Fluoride	0.18	mg/L
Nitrogen, Nitrate	0.24	mg/L
Phenols	0.006	mg/L
Sulfate	23	mg/L
Total Organic Carbon (TOC)	3.0	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	<0.050	mg/L
Calcium	163	mg/L
Iron	4.41	mg/L
Magnesium	45.0	mg/L
Manganese	0.178	mg/L
Sodium	22.0	mg/L
Arsenic	<0.0025	mg/L
Barium	0.226	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	0.030	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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ANALYTICAL REPORT

12-29-89

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

PAGE 2

Sample No.: 4714

Sample Description: #66717

Date Taken: 11-09-89 945

Date Received: 11-09-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<0.50	ug/L
1,1-Dichloroethane	<0.50	ug/L
1,2-Dichloroethane	<0.50	ug/L
Methylene chloride	<0.50	ug/L
Tetrachloroethene	<0.50	ug/L
Toluene	<0.50	ug/L
Trichloroethene	<0.50	ug/L

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ANALYTICAL REPORT

12-29-89

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

PAGE 3

Sample No.: 4716

Sample Description: #66717 - Filtered

Date Taken: 11-09-89 945

Date Received: 11-09-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	156	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	4.33	mg/L
Magnesium, Dissolved	43.8	mg/L
Manganese, Dissolved	0.188	mg/L
Sodium, Dissolved	8.1	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.037	mg/L

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ANALYTICAL REPORT

William Hayes
WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

01-26-90

PAGE 1

Sample No.: 4239

Sample Description: #66687

Date Taken: 11-06-89 1115

Date Received: 11-08-89

Chloride	69	mg/L	
Fluoride	1.02	mg/L	
Nitrogen, Nitrate	0.03	mg/L	
Phenols	0.018	mg/L	
Sulfate	7	mg/L	
Total Organic Carbon (TOC)	4	mg/L	
Total Organic Halogens	13.9	ug/L	Cl-
Aluminum	0.339	mg/L	
Calcium	84.5	mg/L	
Iron	2.10	mg/L	
Magnesium	34.0	mg/L	
Manganese	0.037	mg/L	
Sodium	40.0	mg/L	
Arsenic	0.023	mg/L	
Barium	0.895	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	0.010	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	<0.005	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	<0.020	mg/L	

NOTE: Corrected report. Metals data has been corrected due to interferences caused by water purification failure.

Jackie Webster 275
Jackie Webster
Division Manager

cc: Cindy Daniels, ASI

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ANALYTICAL REPORT

William Hayes
WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

01-26-90

PAGE 2

Sample No.: 4239

Sample Description: #66687

Date Taken: 11-06-89 1115

Date Received: 11-08-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

PAGE 3

Sample No.: 4240

Sample Description: #66689

Date Taken: 11-06-89 1430

Date Received: 11-08-89

Chloride	679	mg/L	
Fluoride	0.15	mg/L	
Nitrogen, Nitrate	0.05	mg/L	
Phenols	0.068	mg/L	
Sulfate	9	mg/L	
Total Organic Carbon (TOC)	4.0	mg/L	
Total Organic Halogens	11.2	mg/L	Cl-
Aluminum	0.847	mg/L	
Calcium	168	mg/L	
Iron	19.6	mg/L	
Magnesium	55.6	mg/L	
Manganese	0.138	mg/L	
Sodium	312	mg/L	
Arsenic	0.101	mg/L	
Barium	0.584	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	0.013	mg/L	
Cobalt	<0.025	mg/L	
Copper	0.028	mg/L	
Lead	0.006	mg/L	
Nickel	<0.005	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	0.050	mg/L	

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Cincinnati OH 45239

PAGE 4

Sample No.: 4240

Sample Description: #66689

Date Taken: 11-06-89 1430

Date Received: 11-08-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

PAGE 5

Sample No.: 4241

Sample Description: #66715

Date Taken: 11-06-89 1630

Date Received: 11-08-89

Chloride	26	mg/L
Fluoride	0.28	mg/L
Nitrogen, Nitrate	0.03	mg/L
Phenols	0.013	mg/L
Sulfate	394	mg/L
Total Organic Carbon (TOC)	<1	mg/L
Total Organic Halogens	<10	mg/L Cl-
Aluminum	0.235	mg/L
Calcium	213	mg/L
Iron	5.22	mg/L
Magnesium	52.4	mg/L
Manganese	0.426	mg/L
Sodium	16.3	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.009	mg/L
Cobalt	<0.025	mg/L
Copper	0.027	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.051	mg/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Cincinnati OH 45239

PAGE 6

Sample No.: 4241

Sample Description: #66715

Date Taken: 11-06-89 1630

Date Received: 11-08-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 4242

Sample Description: #66687 - Filtered

Date Taken: 11-06-89 1115

Date Received: 11-08-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	70.6	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	1.61	mg/L
Magnesium, Dissolved	27.2	mg/L
Manganese, Dissolved	0.027	mg/L
Sodium, Dissolved	46.8	mg/L
Arsenic, Dissolved	0.023	mg/L
Barium, Dissolved	0.844	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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PAGE 8

Sample No.: 4243

Sample Description: #66689 - Filtered

Date Taken: 11-06-89 1430

Date Received: 11-08-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	137	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	12.6	mg/L
Magnesium, Dissolved	49.0	mg/L
Manganese, Dissolved	0.101	mg/L
Sodium, Dissolved	235	mg/L
Arsenic, Dissolved	0.036	mg/L
Barium, Dissolved	0.448	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.047	mg/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 4244

Sample Description: #66715 - Filtered

Date Taken: 11-06-89 1630

Date Received: 11-08-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	201	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	4.48	mg/L
Magnesium, Dissolved	49.0	mg/L
Manganese, Dissolved	0.385	mg/L
Sodium, Dissolved	6.2	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	0.006	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.075	mg/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 4245

Sample Description: #66759 - Trip Blank, D.I. Water

Date Taken: 11-06-89 900

Date Received: 11-08-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

William Hayes
WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

01-26-90

PAGE 1

Sample No.: 4714

Sample Description: #66717

Date Taken: 11-09-89 945

Date Received: 11-09-89

Chloride	44	mg/L
Fluoride	0.18	mg/L
Nitrogen, Nitrate	0.24	mg/L
Phenols	0.006	mg/L
Sulfate	23	mg/L
Total Organic Carbon (TOC)	3.0	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	<0.050	mg/L
Calcium	163	mg/L
Iron	4.41	mg/L
Magnesium	45.0	mg/L
Manganese	0.178	mg/L
Sodium	22.0	mg/L
Arsenic	<0.0025	mg/L
Barium	0.226	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	0.030	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

DUPLICATE

Jackie Webster
Jackie Webster
Division Manager

cc: Cindy Daniels, ASI

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ANALYTICAL REPORT

William Hayes
WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

01-26-90

PAGE 2

Sample No.: 4714

Sample Description: #66717

Date Taken: 11-09-89 945

Date Received: 11-09-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<0.50	ug/L
1,1-Dichloroethane	<0.50	ug/L
1,2-Dichloroethane	<0.50	ug/L
Methylene chloride	<0.50	ug/L
Tetrachloroethene	<0.50	ug/L
Toluene	<0.50	ug/L
Trichloroethene	<0.50	ug/L

DUPLICATE

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
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PAGE 3

Sample No.: 4716

Sample Description: #66717 - Filtered

Date Taken: 11-09-89 945

Date Received: 11-09-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	156	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	4.33	mg/L
Magnesium, Dissolved	43.8	mg/L
Manganese, Dissolved	0.188	mg/L
Sodium, Dissolved	8.1	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.037	mg/L

DUPLICATE

Jackie Webster
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ANALYTICAL REPORT

William Hayes
WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

01-26-90

PAGE 1

Sample No.: 5577

Sample Description: #66683

Date Taken: 11-14-89 1015

Date Received: 11-15-89

Phenols	<0.005	mg/L
Total Organic Carbon (TOC)	3	mg/L
Aluminum	0.266	mg/L
Calcium	104	mg/L
Iron	1.72	mg/L
Magnesium	37.2	mg/L
Manganese	0.252	mg/L
Sodium	38.2	mg/L
Arsenic	<0.0025	mg/L
Barium	0.292	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.011	mg/L
Cobalt	<0.025	mg/L
Copper	0.033	mg/L
Lead	0.007	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.081	mg/L

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c: Cindy Daniels, ASI

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Sample No.: 5577

Sample Description: #66683

Date Taken: 11-14-89 1015

Date Received: 11-15-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

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COMPANY OF OHIO
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Sample No.: 5578

Sample Description: #66685

Date Taken: 11-14-89 1345

Date Received: 11-15-89

Chloride	15	mg/L
Fluoride	0.29	mg/L
Nitrogen, Nitrate	0.02	mg/L
Phenols	<0.005	mg/L
Sulfate	4	mg/L
Total Organic Carbon (TOC)	3	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	<0.050	mg/L
Calcium	89.3	mg/L
Iron	3.41	mg/L
Magnesium	25.5	mg/L
Manganese	0.062	mg/L
Sodium	24.6	mg/L
Arsenic	0.014	mg/L
Barium	0.241	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.037	mg/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 5578

Sample Description: #66685

Date Taken: 11-14-89 1345

Date Received: 11-15-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.50	ug/L
1,1-Dichloroethane	<2.50	ug/L
1,2-Dichloroethane	<2.50	ug/L
Methylene chloride	<2.50	ug/L
Tetrachloroethene	<2.50	ug/L
Toluene	<2.50	ug/L
Trichloroethene	<2.50	ug/L

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Sample No.: 5580

Sample Description: #66761 - Trip Blank

Date Taken: 11-14-89 900

Date Received: 11-15-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.50	ug/L
1,1-Dichloroethane	<2.50	ug/L
1,2-Dichloroethane	<2.50	ug/L
Methylene chloride	<2.50	ug/L
Tetrachloroethene	<2.50	ug/L
Toluene	<2.50	ug/L
Trichloroethene	<2.50	ug/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 5606

Sample Description: #66683 - Filtered

Date Taken: 11-14-89 1015

Date Received: 11-15-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	96.7	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	0.548	mg/L
Magnesium, Dissolved	34.2	mg/L
Manganese, Dissolved	0.205	mg/L
Sodium, Dissolved	38.9	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	0.283	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 5607

Sample Description: #66685 - Filtered

Date Taken: 11-14-89 1345

Date Received: 11-15-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	79.4	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	1.73	mg/L
Magnesium, Dissolved	24.4	mg/L
Manganese, Dissolved	0.061	mg/L
Sodium, Dissolved	18.5	mg/L
Arsenic, Dissolved	0.010	mg/L
Barium, Dissolved	0.299	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.040	mg/L

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ANALYTICAL REPORT

William Hayes
WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

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Sample No.: 5669

Sample Description: #66701

Date Taken: 11-16-89 1010

Date Received: 11-17-89

Chloride	246	mg/L
Fluoride	0.44	mg/L
Nitrogen, Nitrate	0.40	mg/L
Phenols	<0.005	mg/L
Sulfate	267	mg/L
Total Organic Carbon (TOC)	4	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	<0.050	mg/L
Calcium	243	mg/L
Iron	9.49	mg/L
Magnesium	87	mg/L
Manganese	0.114	mg/L
Sodium	83.7	mg/L
Arsenic	<0.0025	mg/L
Barium	0.264	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.008	mg/L
Cobalt	<0.025	mg/L
Copper	0.027	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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cc: Cindy Daniels, ASI

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William Hayes
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Sample No.: 5669

Sample Description: #66701

Date Taken: 11-16-89 1010

Date Received: 11-17-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.50	ug/L
1,1-Dichloroethane	<2.50	ug/L
1,2-Dichloroethane	<2.50	ug/L
Methylene chloride	<2.50	ug/L
Tetrachloroethene	<2.50	ug/L
Toluene	<2.50	ug/L
Trichloroethene	<2.50	ug/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 5670

Sample Description: #66697

Date Taken: 11-16-89 1110

Date Received: 11-17-89

Chloride	23	mg/L
Fluoride	0.21	mg/L
Nitrogen, Nitrate	0.03	mg/L
Phenols	<0.005	mg/L
Sulfate	88	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	0.062	mg/L
Calcium	101	mg/L
Iron	2.46	mg/L
Magnesium	26.7	mg/L
Manganese	0.242	mg/L
Sodium	14.4	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.010	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Cincinnati OH 45239

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Sample No.: 5670

Sample Description: #66697

Date Taken: 11-16-89 1110

Date Received: 11-17-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.50	ug/L
1,1-Dichloroethane	<2.50	ug/L
1,2-Dichloroethane	<2.50	ug/L
Methylene chloride	<2.50	ug/L
Tetrachloroethene	<2.50	ug/L
Toluene	<2.50	ug/L
Trichloroethene	<2.50	ug/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

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Sample No.: 5671

Sample Description: #66699

Date Taken: 11-16-89 1200

Date Received: 11-17-89

Chloride	52	mg/L
Fluoride	0.36	mg/L
Nitrogen, Nitrate	0.14	mg/L
Phenols	<0.005	mg/L
Sulfate	238	mg/L
Total Organic Carbon (TOC)	2	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	0.899	mg/L
Calcium	182	mg/L
Iron	7.10	mg/L
Magnesium	42.9	mg/L
Manganese	0.410	mg/L
Sodium	50.6	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.007	mg/L
Cobalt	<0.025	mg/L
Copper	0.026	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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WESTINGHOUSE MATERIALS
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Cincinnati OH 45239

PAGE 6

Sample No.: 5671

Sample Description: #66699

Date Taken: 11-16-89 1200

Date Received: 11-17-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.50	ug/L
1,1-Dichloroethane	<2.50	ug/L
1,2-Dichloroethane	<2.50	ug/L
Methylene chloride	<2.50	ug/L
Tetrachloroethene	<2.50	ug/L
Toluene	<2.50	ug/L
Trichloroethene	<2.50	ug/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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PAGE 7

Sample No.: 5672

Sample Description: #66709

Date Taken: 11-16-89 1530

Date Received: 11-17-89

Phenols	<0.005	mg/L
Total Organic Carbon (TOC)	4	mg/L
Aluminum	0.256	mg/L
Calcium	258	mg/L
Iron	51.2	mg/L
Magnesium	54.2	mg/L
Manganese	1.41	mg/L
Sodium	36.5	mg/L
Arsenic	0.008	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.007	mg/L
Cobalt	<0.025	mg/L
Copper	0.045	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.107	mg/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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PAGE 8

Sample No.: 5672

Sample Description: #66709

Date Taken: 11-16-89 1530

Date Received: 11-17-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.50	ug/L
1,1-Dichloroethane	<2.50	ug/L
1,2-Dichloroethane	<2.50	ug/L
Methylene chloride	<2.50	ug/L
Tetrachloroethene	<2.50	ug/L
Toluene	<2.50	ug/L
Trichloroethene	<2.50	ug/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 5673

Sample Description: #66743

Date Taken: 11-16-89 1530

Date Received: 11-17-89

Chloride	104	mg/L
Fluoride	0.72	mg/L
Nitrogen, Nitrate	0.14	mg/L
Phenols	<0.005	mg/L
Sulfate	515	mg/L
Total Organic Carbon (TOC)	2	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	0.210	mg/L
Calcium	289	mg/L
Iron	40.2	mg/L
Magnesium	51.4	mg/L
Manganese	1.37	mg/L
Sodium	36.9	mg/L
Arsenic	0.006	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	0.043	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.086	mg/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 5673

Sample Description: #66743

Date Taken: 11-16-89 1530

Date Received: 11-17-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.50	ug/L
1,1-Dichloroethane	<2.50	ug/L
1,2-Dichloroethane	<2.50	ug/L
Methylene chloride	<2.50	ug/L
Tetrachloroethene	<2.50	ug/L
Toluene	<2.50	ug/L
Trichloroethene	<2.50	ug/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 5679

Sample Description: #66701 - Filtered

Date Taken: 11-16-89 1010

Date Received: 11-17-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	235	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	9.17	mg/L
Magnesium, Dissolved	82.6	mg/L
Manganese, Dissolved	0.113	mg/L
Sodium, Dissolved	60.2	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	0.285	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 5680

Sample Description: #66697 - Filtered

Date Taken: 11-16-89 1110

Date Received: 11-17-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	104	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	2.47	mg/L
Magnesium, Dissolved	25.1	mg/L
Manganese, Dissolved	0.202	mg/L
Sodium, Dissolved	14.1	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 5681

Sample Description: #66699 - Filtered

Date Taken: 11-16-89 1200

Date Received: 11-17-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	167	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	6.85	mg/L
Magnesium, Dissolved	41.0	mg/L
Manganese, Dissolved	0.399	mg/L
Sodium, Dissolved	31.1	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.027	mg/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 5682

Sample Description: #66709 - Filtered

Date Taken: 11-16-89 1530

Date Received: 11-17-89

Aluminum, Dissolved	0.203	mg/L
Calcium, Dissolved	298	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	6.90	mg/L
Magnesium, Dissolved	53.2	mg/L
Manganese, Dissolved	1.23	mg/L
Sodium, Dissolved	22.1	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.090	mg/L

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Sample No.: 5683

Sample Description: #66743 - Filtered

Date Taken: 11-16-89 1530

Date Received: 11-17-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	303	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	7.37	mg/L
Magnesium, Dissolved	54.2	mg/L
Manganese, Dissolved	1.22	mg/L
Sodium, Dissolved	23.3	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.059	mg/L

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Sample No.: 5684

Sample Description: #66763 - Trip Blank

Date Taken: 11-16-89 830

Date Received: 11-17-89

VOLATILE COMPOUNDS

METHOD 8240

1,1-Dichloroethane	<2.50	ug/L
1,2-Dichloroethane	<2.50	ug/L
Methylene chloride	<2.50	ug/L
Tetrachloroethene	<2.50	ug/L
Toluene	<2.50	ug/L
Trichloroethene	<2.50	ug/L

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William Hayes
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Sample No.: 6346

Sample Description: #66711

Date Taken: 11-19-89 1440

Date Received: 11-20-89

Chloride	24	mg/L	
Fluoride	0.25	mg/L	
Nitrogen, Nitrate	0.05	mg/L	
Phenols	0.016	mg/L	
Sulfate	295	mg/L	
Total Organic Carbon (TOC)	2	mg/L	
Total Organic Halogens	<10	ug/L	Cl-
Aluminum	0.072	mg/L	
Calcium	189	mg/L	
Iron	5.05	mg/L	
Magnesium	30.9	mg/L	
Manganese	0.547	mg/L	
Sodium	19.9	mg/L	
Arsenic	<0.0025	mg/L	
Barium	<0.200	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	<0.005	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	<0.005	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	0.025	mg/L	

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cc: Cindy Daniels, ASI

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Sample No.: 6346

Sample Description: #66711

Date Taken: 11-19-89 1440

Date Received: 11-20-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 6347

Sample Description: #66713

Date Taken: 11-19-89 1700

Date Received: 11-20-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6348

Sample Description: #66711 - Filtered

Date Taken: 11-19-89 1440

Date Received: 11-20-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	192	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	4.62	mg/L
Magnesium, Dissolved	29.0	mg/L
Manganese, Dissolved	0.617	mg/L
Sodium, Dissolved	10.7	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.032	mg/L

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Sample No.: 6349

Sample Description: #66713 - Filtered

Date Taken: 11-19-89 1700

Date Received: 11-20-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	273	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	14.9	mg/L
Magnesium, Dissolved	61.0	mg/L
Manganese, Dissolved	0.791	mg/L
Sodium, Dissolved	57.9	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	0.209	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.024	mg/L

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William Hayes
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Sample No.: 6618

Sample Description: #66745

Date Taken: 11-21-89 1600

Date Received: 11-22-89

Chloride	56	mg/L
Fluoride	0.29	mg/L
Nitrogen, Nitrate	2.25	mg/L
Phenols	0.005	mg/L
Sulfate	134	mg/L
Total Organic Carbon (TOC)	2	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	2.17	mg/L
Calcium	147	mg/L
Iron	2.15	mg/L
Magnesium	47.8	mg/L
Manganese	0.108	mg/L
Sodium	19.2	mg/L
Arsenic	<0.0025	mg/L
Barium	0.265	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	0.031	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.031	mg/L

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: Cindy Daniels, ASI

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PAGE 2

Sample No.: 6618

Sample Description: #66745

Date Taken: 11-21-89 1600

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6619

Sample Description: #66659

Date Taken: 11-21-89 1710

Date Received: 11-22-89

Chloride	9	mg/L
Fluoride	0.78	mg/L
Nitrogen, Nitrate	0.32	mg/L
Phenols	0.023	mg/L
Sulfate	139	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	0.262	mg/L
Calcium	110	mg/L
Iron	1.67	mg/L
Magnesium	42.5	mg/L
Manganese	0.169	mg/L
Sodium	24.8	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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Sample No.: 6619

Sample Description: #66659

Date Taken: 11-21-89 1710

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6620

Sample Description: #66663

Date Taken: 11-21-89 1545

Date Received: 11-22-89

Chloride	5	mg/L
Fluoride	0.65	mg/L
Nitrogen, Nitrate	1.41	mg/L
Phenols	0.012	mg/L
Sulfate	153	mg/L
Total Organic Carbon (TOC)	9	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	6.92	mg/L
Calcium	213	mg/L
Iron	8.00	mg/L
Magnesium	115	mg/L
Manganese	0.279	mg/L
Sodium	57.0	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.246	mg/L
Cobalt	<0.025	mg/L
Copper	0.156	mg/L
Lead	0.016	mg/L
Nickel	0.193	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.100	mg/L

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Sample No.: 6620

Sample Description: #66663

Date Taken: 11-21-89 1545

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

etone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
oluene	<2.5	ug/L
richloroethene	<2.5	ug/L

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Sample No.: 6621

Sample Description: #66681

Date Taken: 11-21-89 1600

Date Received: 11-22-89

Chloride	57	mg/L	
Fluoride	0.24	mg/L	
Nitrogen, Nitrate	2.33	mg/L	
Phenols	<0.005	mg/L	
Sulfate	143	mg/L	
Total Organic Carbon (TOC)	2	mg/L	
Total Organic Halogens	<10	ug/L	Cl-
Aluminum	6.69	mg/L	
Calcium	154	mg/L	
Iron	1.66	mg/L	
Magnesium	48.6	mg/L	
Manganese	0.073	mg/L	
Sodium	16.3	mg/L	
Arsenic	<0.0025	mg/L	
Barium	<0.200	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	0.008	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	<0.005	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	0.035	mg/L	

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Sample No.: 6621

Sample Description: #66681

Date Taken: 11-21-89 1600

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6622

Sample Description: #66671

Date Taken: 11-21-89 1500

Date Received: 11-22-89

Chloride	128	mg/L
Fluoride	0.99	mg/L
Nitrogen, Nitrate	0.26	mg/L
Phenols	<0.005	mg/L
Sulfate	71	mg/L
Total Organic Carbon (TOC)	<1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	3.55	mg/L
Calcium	289	mg/L
Iron	6.48	mg/L
Magnesium	68.0	mg/L
Manganese	0.317	mg/L
Sodium	15.2	mg/L
Arsenic	<0.0025	mg/L
Barium	0.264	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.343	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	0.008	mg/L
Nickel	0.368	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.023	mg/L

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Sample No.: 6622

Sample Description: #66671

Date Taken: 11-21-89 1500

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6623

Sample Description: #66665

Date Taken: 11-21-89 1520

Date Received: 11-22-89

Chloride	1,100	mg/L
Fluoride	1.18	mg/L
Nitrogen, Nitrate	25.4	mg/L
Phenols	0.012	mg/L
Sulfate	173	mg/L
Total Organic Carbon (TOC)	9	mg/L
Total Organic Halogens	752	ug/L Cl-
Aluminum	1.50	mg/L
Calcium	331	mg/L
Iron	12.5	mg/L
Magnesium	4.9	mg/L
Manganese	0.625	mg/L
Sodium	533	mg/L
Arsenic	<0.0025	mg/L
Barium	0.362	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	3.48	mg/L
Cobalt	<0.025	mg/L
Copper	0.076	mg/L
Lead	<0.005	mg/L
Nickel	1.61	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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Sample No.: 6623

Sample Description: #66665

Date Taken: 11-21-89 1520

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<12.5	ug/L
1,1-Dichloroethane	45.0	ug/L
1,2-Dichloroethane	<12.5	ug/L
Methylene chloride	<12.5	ug/L
Tetrachloroethene	248.0	ug/L
Toluene	<12.5	ug/L
Trichloroethene	527.0	ug/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

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Sample No.: 6624

Sample Description: #66653

Date Taken: 11-21-89 1310

Date Received: 11-22-89

Chloride	6	mg/L
Fluoride	0.79	mg/L
Nitrogen, Nitrate	0.35	mg/L
Phenols	<0.005	mg/L
Sulfate	94	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	5.20	mg/L
Calcium	117	mg/L
Iron	6.68	mg/L
Magnesium	43.8	mg/L
Manganese	0.149	mg/L
Sodium	25.9	mg/L
Arsenic	0.005	mg/L
Barium	0.209	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.058	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	0.039	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.054	mg/L

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Cincinnati OH 45239

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Sample No.: 6624

Sample Description: #66653

Date Taken: 11-21-89 1310

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6625

Sample Description: #66747

Date Taken: 11-21-89 1310

Date Received: 11-22-89

Chloride	6	mg/L
Fluoride	0.95	mg/L
Nitrogen, Nitrate	0.33	mg/L
Phenols	0.011	mg/L
Sulfate	78	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	5.65	mg/L
Calcium	124	mg/L
Iron	7.41	mg/L
Magnesium	46.4	mg/L
Manganese	0.164	mg/L
Sodium	27.7	mg/L
Arsenic	0.005	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.012	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	0.011	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.061	mg/L

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Sample No.: 6625

Sample Description: #66747

Date Taken: 11-21-89 1310

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6626

Sample Description: #66679

Date Taken: 11-21-89 1650

Date Received: 11-22-89

Chloride	39	mg/L	
Fluoride	0.76	mg/L	
Nitrogen, Nitrate	0.38	mg/L	
Phenols	<0.005	mg/L	
Sulfate	213	mg/L	
Total Organic Carbon (TOC)	3	mg/L	
Total Organic Halogens	<10	ug/L	Cl-
Aluminum	16.0	mg/L	
Calcium	198	mg/L	
Iron	18.5	mg/L	
Magnesium	86	mg/L	
Manganese	0.304	mg/L	
Sodium	28.6	mg/L	
Arsenic	0.006	mg/L	
Barium	0.341	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	0.026	mg/L	
Cobalt	<0.025	mg/L	
Copper	0.040	mg/L	
Lead	0.007	mg/L	
Nickel	0.032	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	0.073	mg/L	

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COMPANY OF OHIO
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Sample No.: 6626

Sample Description: #66679

Date Taken: 11-21-89 1650

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6627

Sample Description: #66657

Date Taken: 11-21-89 1420

Date Received: 11-22-89

Chloride	899	mg/L
Fluoride	0.55	mg/L
Nitrogen, Nitrate	152	mg/L
Phenols	0.011	mg/L
Sulfate	338	mg/L
Total Organic Carbon (TOC)	3	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	11.8	mg/L
Calcium	583	mg/L
Iron	18.0	mg/L
Magnesium	207	mg/L
Manganese	0.845	mg/L
Sodium	215	mg/L
Arsenic	0.007	mg/L
Barium	0.656	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.073	mg/L
Cobalt	<0.025	mg/L
Copper	0.042	mg/L
Lead	0.010	mg/L
Nickel	0.065	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.098	mg/L

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Sample No.: 6627

Sample Description: #66657

Date Taken: 11-21-89 1420

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6628

Sample Description: #66673

Date Taken: 11-21-89 0945

Date Received: 11-22-89

Chloride	3	mg/L
Fluoride	0.90	mg/L
Nitrogen, Nitrate	0.44	mg/L
Phenols	0.024	mg/L
Sulfate	200	mg/L
Total Organic Carbon (TOC)	2	mg/L
Total Organic Halogens	<10	ug/L Cl-
luminum	7.92	mg/L
alcium	148	mg/L
ron	8.31	mg/L
agnesium	64.0	mg/L
Manganese	0.235	mg/L
Sodium	21.7	mg/L
Arsenic	0.005	mg/L
Barium	0.216	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.015	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	0.018	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.036	mg/L

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Sample No.: 6628

Sample Description: #66673

Date Taken: 11-21-89 0945

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6629

Sample Description: #66651

Date Taken: 11-21-89 1120

Date Received: 11-22-89

Chloride	2	mg/L
Fluoride	0.85	mg/L
Nitrogen, Nitrate	0.44	mg/L
Phenols	0.012	mg/L
Sulfate	48	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	3.11	mg/L
Calcium	98.2	mg/L
Iron	4.66	mg/L
Magnesium	43.8	mg/L
Manganese	0.245	mg/L
Sodium	27.9	mg/L
Arsenic	0.006	mg/L
Barium	0.254	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.028	mg/L

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COMPANY OF OHIO
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Sample No.: 6629

Sample Description: #66651

Date Taken: 11-21-89 1120

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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COMPANY OF OHIO
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Sample No.: 6630

Sample Description: #66667

Date Taken: 11-22-89 0840

Date Received: 11-22-89

Chloride	16	mg/L
Fluoride	0.55	mg/L
Nitrogen, Nitrate	0.32	mg/L
Phenols	0.010	mg/L
Sulfate	136	mg/L
Total Organic Carbon (TOC)	3	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	4.83	mg/L
Calcium	165	mg/L
Iron	10.8	mg/L
Magnesium	69.2	mg/L
Manganese	0.434	mg/L
Sodium	13.8	mg/L
Arsenic	0.009	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.011	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.040	mg/L

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Sample No.: 630

Sample Description: #66667

Date Taken: 11-22-89 0840

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	2.7	ug/L
Trichloroethene	<2.5	ug/L

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COMPANY OF OHIO
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Sample No.: 6631

Sample Description: #66677

Date Taken: 11-22-89 0830

Date Received: 11-22-89

Chloride	34	mg/L	
Fluoride	0.39	mg/L	
Nitrogen, Nitrate	16.5	mg/L	
Phenols	0.006	mg/L	
Sulfate	392	mg/L	
Total Organic Carbon (TOC)	3	mg/L	
Total Organic Halogens	<10	ug/L	Cl-
Aluminum	2.00	mg/L	
Calcium	261	mg/L	
Iron	2.49	mg/L	
Magnesium	100	mg/L	
Manganese	0.053	mg/L	
Sodium	54.6	mg/L	
Arsenic	<0.0025	mg/L	
Barium	<0.200	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	0.013	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	<0.005	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	0.024	mg/L	

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COMPANY OF OHIO
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Cincinnati OH 45239

Sample No.: 6631

Sample Description: #66677

Date Taken: 11-22-89 0830

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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COMPANY OF OHIO
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Sample No.: 6632

Sample Description: #66703

Date Taken: 11-20-89 1110

Date Received: 11-22-89

Chloride	47	mg/L
Fluoride	0.31	mg/L
Nitrogen, Nitrate	71.0	mg/L
Phenols	0.013	mg/L
Sulfate	79	mg/L
Total Organic Carbon (TOC)	2	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	0.080	mg/L
Calcium	155	mg/L
Iron	0.156	mg/L
Magnesium	30.4	mg/L
Manganese	<0.020	mg/L
Sodium	38.4	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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Sample No.: 6632

Sample Description: #66703

Date Taken: 11-20-89 1110

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

	<2.5	ug/L
chloroethane	<2.5	ug/L
Dichloroethane	<2.5	ug/L
hylene chloride	<2.5	ug/L
trachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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COMPANY OF OHIO
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Sample No.: 6633

Sample Description: #66705

Date Taken: 11-20-89 1620

Date Received: 11-22-89

Chloride	58	mg/L	
Fluoride	0.17	mg/L	
Nitrogen, Nitrate	36.3	mg/L	
Phenols	0.007	mg/L	
Sulfate	403	mg/L	
Total Organic Carbon (TOC)	3	mg/L	
Total Organic Halogens	<10	ug/L	Cl-
Aluminum	0.141	mg/L	
Calcium	253	mg/L	
Iron	0.103	mg/L	
Magnesium	30.4	mg/L	
Manganese	3.37	mg/L	
Sodium	47.8	mg/L	
Arsenic	<0.0025	mg/L	
Barium	0.333	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	<0.005	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	<0.005	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	<0.020	mg/L	

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 6634

Sample Description: #66727

Date Taken: 11-20-89 1745

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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WESTINGHOUSE MATERIALS
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Sample No.: 6635

Sample Description: #66729

Date Taken: 11-20-89 1830

Date Received: 11-22-89

Chloride	30	mg/L
Fluoride	0.18	mg/L
Nitrogen, Nitrate	0.35	mg/L
Phenols	<0.005	mg/L
Sulfate	36	mg/L
Total Organic Carbon (TOC)	4	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	<0.050	mg/L
Calcium	104	mg/L
Iron	5.38	mg/L
Magnesium	28.5	mg/L
Manganese	0.451	mg/L
Sodium	20.0	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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Sample No.: 6635

Sample Description: #66729

Date Taken: 11-20-89 1830

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6636

Sample Description: #66765

Date Taken: 11-19-89 0930

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 6637

Sample Description: #66767

Date Taken: 11-20-89 0815

Date Received: 11-22-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/l

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Sample No.: 6639

Sample Description: #66745 - Filtered

Date Taken: 11-21-89 1600

Date Received: 11-22-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	137	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	44.8	mg/L
Manganese, Dissolved	0.042	mg/L
Sodium, Dissolved	13.8	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6640

Sample Description: #66659 - Filtered

Date Taken: 11-21-89 1710

Date Received: 11-22-89

Aluminum, Dissolved	0.567	mg/L
Calcium, Dissolved	104	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	0.835	mg/L
Magnesium, Dissolved	40.7	mg/L
Manganese, Dissolved	0.129	mg/L
Sodium, Dissolved	19.6	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6641

Sample Description: #66663 - Filtered

Date Taken: 11-21-89 1545

Date Received: 11-22-89

Aluminum, Dissolved	1.30	mg/L
Calcium, Dissolved	162	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	1.37	mg/L
Magnesium, Dissolved	101	mg/L
Manganese, Dissolved	0.224	mg/L
Sodium, Dissolved	32.0	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	0.059	mg/L
Copper, Dissolved	0.120	mg/L
Lead, Dissolved	0.012	mg/L
Nickel, Dissolved	0.054	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.048	mg/L

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Sample No.: 6642

Sample Description: #66681 - Filtered

Date Taken: 11-21-89 1600

Date Received: 11-22-89

Aluminum, Dissolved	0.237	mg/L
Calcium, Dissolved	133	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	0.142	mg/L
Magnesium, Dissolved	43.8	mg/L
Manganese, Dissolved	0.051	mg/L
Sodium, Dissolved	12.1	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6643

Sample Description: #66671 - Filtered

Date Taken: 11-21-89 1500

Date Received: 11-22-89

Aluminum, Dissolved	0.737	mg/L
Calcium, Dissolved	114	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	59.2	mg/L
Manganese, Dissolved	0.115	mg/L
Sodium, Dissolved	9.6	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	0.322	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6644

Sample Description: #66665 - Filtered

Date Taken: 11-21-89 1520

Date Received: 11-22-89

Aluminum, Dissolved	0.315	mg/L
Calcium, Dissolved	295	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	4.6	mg/L
Manganese, Dissolved	<0.020	mg/L
Sodium, Dissolved	246	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	0.259	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	0.041	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	0.087	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6645

Sample Description: #66653 - Filtered

Date Taken: 11-21-89 1310

Date Received: 11-22-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	99.0	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	38.6	mg/L
Manganese, Dissolved	<0.020	mg/L
Sodium, Dissolved	20.4	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.022	mg/L

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Sample No.: 6646

Sample Description: #66747 - Filtered

Date Taken: 11-21-89 1310

Date Received: 11-22-89

Aluminum, Dissolved	0.427	mg/L
Calcium, Dissolved	114	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	0.058	mg/L
Magnesium, Dissolved	40.8	mg/L
Manganese, Dissolved	<0.020	mg/L
Sodium, Dissolved	30.4	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6647

Sample Description: #66679 - Filtered

Date Taken: 11-21-89 1650

Date Received: 11-22-89

Aluminum, Dissolved	0.609	mg/L
Calcium, Dissolved	157	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	0.362	mg/L
Magnesium, Dissolved	71.8	mg/L
Manganese, Dissolved	0.058	mg/L
Sodium, Dissolved	28.9	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	0.006	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.023	mg/L

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Sample No.: 6648

Sample Description: #66657 - Filtered

Date Taken: 11-21-89 1420

Date Received: 11-22-89

Aluminum, Dissolved	0.122	mg/L
Calcium, Dissolved	462	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	192	mg/L
Manganese, Dissolved	0.377	mg/L
Sodium, Dissolved	225	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	0.302	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	0.024	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6649

Sample Description: #66673 - Filtered

Date Taken: 11-21-89 0945

Date Received: 11-22-89

Aluminum, Dissolved	0.176	mg/L
Calcium, Dissolved	133	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	59.0	mg/L
Manganese, Dissolved	0.062	mg/L
Sodium, Dissolved	19.3	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6650

Sample Description: #66651 - Filtered

Date Taken: 11-21-89 1120

Date Received: 11-22-89

Aluminum, Dissolved	0.294	mg/L
Calcium, Dissolved	85.2	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	0.627	mg/L
Magnesium, Dissolved	40.7	mg/L
Manganese, Dissolved	0.146	mg/L
Sodium, Dissolved	31.8	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6651

Sample Description: #66667 - Filtered

Date Taken: 11-22-89 0840

Date Received: 11-22-89

Aluminum, Dissolved	0.070	mg/L
Calcium, Dissolved	129	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	0.491	mg/L
Magnesium, Dissolved	56.0	mg/L
Manganese, Dissolved	0.237	mg/L
Sodium, Dissolved	14.1	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6652

Sample Description: #66677 - Filtered

Date Taken: 11-22-89 0830

Date Received: 11-22-89

Aluminum, Dissolved	0.410	mg/L
Calcium, Dissolved	239	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	97	mg/L
Manganese, Dissolved	<0.020	mg/L
Sodium, Dissolved	55.6	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6653

Sample Description: #66703 - Filtered

Date Taken: 11-20-89 1110

Date Received: 11-22-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	150	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	29.2	mg/L
Manganese, Dissolved	<0.020	mg/L
Sodium, Dissolved	42.5	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6654

Sample Description: #66705 - Filtered

Date Taken: 11-20-89 1620

Date Received: 11-22-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	254	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	29.7	mg/L
Manganese, Dissolved	3.09	mg/L
Sodium, Dissolved	52.4	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 6655

Sample Description: #66727 - Filtered

Date Taken: 11-20-89 1745

Date Received: 11-22-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	89.0	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	2.49	mg/L
Magnesium, Dissolved	24.9	mg/L
Manganese, Dissolved	0.558	mg/L
Sodium, Dissolved	14.5	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 6656

Sample Description: #66729 - Filtered

Date Taken: 11-20-89 1830

Date Received: 11-22-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	110	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	5.08	mg/L
Magnesium, Dissolved	27.4	mg/L
Manganese, Dissolved	0.447	mg/L
Sodium, Dissolved	18.5	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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William Hayes
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Sample No.: 7019

Sample Description: #66769

Date Taken: 11-27-89 1100

Date Received: 11-28-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5 ug/L
[illegible]chloroethane	<2.5 ug/L
[illegible]loroethane	<2.5 ug/L
[illegible]ylene chloride	<2.5 ug/L
Tetrachloroethene	<2.5 ug/L
Toluene	<2.5 ug/L
Trichloroethene	<2.5 ug/L

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cc: Cindy Daniels, ASI

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Sample No.: 7020

Sample Description: #66675

Date Taken: 11-27-89 1500

Date Received: 11-28-89

Chloride	5	mg/L
Fluoride	0.86	mg/L
Nitrogen, Nitrate	0.24	mg/L
Phenols	0.025	mg/L
Sulfate	190	mg/L
Total Organic Carbon (TOC)	2	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	6.90	mg/L
Calcium	147	mg/L
Iron	7.83	mg/L
Magnesium	82	mg/L
Manganese	0.221	mg/L
Sodium	23.5	mg/L
Arsenic	0.013	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.009	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	0.005	mg/L
Nickel	0.010	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.037	mg/L

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Sample No.: 7020

Sample Description: #66675

Date Taken: 11-27-89 1500

Date Received: 11-28-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5 ug/L
1,1-Dichloroethane	<2.5 ug/L
1,2-Dichloroethane	<2.5 ug/L
Methylene chloride	<2.5 ug/L
Tetrachloroethene	<2.5 ug/L
Toluene	<2.5 ug/L
Trichloroethene	<2.5 ug/L

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Sample No.: 7021

Sample Description: #66695

Date Taken: 11-27-89 1500

Date Received: 11-28-89

Chloride	30	mg/L
Fluoride	0.48	mg/L
Nitrogen, Nitrate	0.04	mg/L
Phenols	0.007	mg/L
Sulfate	60	mg/L
Total Organic Carbon (TOC)	3	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	<0.050	mg/L
Calcium	92.1	mg/L
Iron	4.07	mg/L
Magnesium	31.3	mg/L
Manganese	0.058	mg/L
Sodium	21.2	mg/L
Arsenic	<0.0025	mg/L
Barium	0.512	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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Sample No.: 7021

Sample Description: #66695

Date Taken: 11-27-89 1500

Date Received: 11-28-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5 ug/L
1,1-Dichloroethane	<2.5 ug/L
1,2-Dichloroethane	<2.5 ug/L
Methylene chloride	<2.5 ug/L
Tetrachloroethene	<2.5 ug/L
Toluene	<2.5 ug/L
Trichloroethene	<2.5 ug/L

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Sample No.: 7022

Sample Description: #66691

Date Taken: 11-27-89 1600

Date Received: 11-28-89

Chloride	33	mg/L	
Fluoride	0.18	mg/L	
Nitrogen, Nitrate	0.09	mg/L	
Phenols	0.005	mg/L	
Sulfate	546	mg/L	
Total Organic Carbon (TOC)	3	mg/L	
Total Organic Halogens	<10	ug/L	Cl-
Aluminum	0.070	mg/L	
Calcium	332	mg/L	
Iron	4.73	mg/L	
Magnesium	52.8	mg/L	
Manganese	3.17	mg/L	
Sodium	11.7	mg/L	
Arsenic	<0.0025	mg/L	
Barium	0.393	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	<0.005	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	0.013	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	0.036	mg/L	

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WESTINGHOUSE MATERIALS
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Sample No.: 7022

Sample Description: #66691

Date Taken: 11-27-89 1600

Date Received: 11-28-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5 ug/L
1,1-Dichloroethane	<2.5 ug/L
1,2-Dichloroethane	<2.5 ug/L
Methylene chloride	<2.5 ug/L
Tetrachloroethene	<2.5 ug/L
Toluene	<2.5 ug/L
Trichloroethene	<2.5 ug/L

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Sample No.: 7023

Sample Description: #66675 - Filtered

Date Taken: 11-27-89 1500

Date Received: 11-28-89

Aluminum, Dissolved	0.330	mg/L
Calcium, Dissolved	127	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	0.232	mg/L
Magnesium, Dissolved	73.6	mg/L
Manganese, Dissolved	0.046	mg/L
Sodium, Dissolved	15.5	mg/L
Arsenic, Dissolved	0.005	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 7024

Sample Description: #66695 - Filtered

Date Taken: 11-27-89 1500

Date Received: 11-28-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	90.1	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	3.40	mg/L
Magnesium, Dissolved	29.9	mg/L
Manganese, Dissolved	0.065	mg/L
Sodium, Dissolved	25.2	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	0.528	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 7025

Sample Description: #66691 - Filtered

Date Taken: 11-27-89 1600

Date Received: 11-28-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	327	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	3.82	mg/L
Magnesium, Dissolved	53.0	mg/L
Manganese, Dissolved	2.82	mg/L
Sodium, Dissolved	14.0	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	0.234	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	0.013	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.033	mg/L

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ANALYTICAL REPORT

William Hayes
WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 7157

Sample Description: #66693

Date Taken: 11-28-89 1015

Date Received: 11-29-89

Chloride	54	mg/L
Fluoride	0.11	mg/L
Nitrogen, Nitrate	<0.02	mg/L
Phenols	0.013	mg/L
Sulfate	358	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	0.063	mg/L
Calcium	219	mg/L
Iron	5.76	mg/L
Magnesium	30.4	mg/L
Manganese	2.98	mg/L
Sodium	71.2	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.046	mg/L

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cc: Cindy Daniels, ASI

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ANALYTICAL REPORT

William Hayes
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Sample No.: 7157

Sample Description: #66693

Date Taken: 11-28-89 1015

Date Received: 11-29-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 7158

Sample Description: #66771

Date Taken: 11-28-89 0940

Date Received: 11-29-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<0.5	ug/L
1,1-Dichloroethane	<0.5	ug/L
1,2-Dichloroethane	<0.5	ug/L
Methylene chloride	<0.5	ug/L
Tetrachloroethene	<0.5	ug/L
Toluene	<0.5	ug/L
Trichloroethene	<0.5	ug/L

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Sample No.: 7159

Sample Description: #66725

Date Taken: 11-28-89 1615

Date Received: 11-29-89

Chloride	223	mg/L	
Fluoride	0.13	mg/L	
Nitrogen, Nitrate	7.40	mg/L	
Phenols	0.016	mg/L	
Sulfate	382	mg/L	
Total Organic Carbon (TOC)	1	mg/L	
Total Organic Halogens	24	ug/L	Cl-
Aluminum	<0.050	mg/L	
Calcium	247	mg/L	
Iron	0.254	mg/L	
Magnesium	80	mg/L	
Manganese	2.99	mg/L	
Sodium	63.3	mg/L	
Arsenic	<0.0025	mg/L	
Barium	<0.200	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	<0.005	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	0.011	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	0.024	mg/L	

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Sample No.: 7160

Sample Description: #66723

Date Taken: 11-28-89 1130

Date Received: 11-29-89

Chloride	184	mg/L
Fluoride	0.17	mg/L
Nitrogen, Nitrate	5.76	mg/L
Phenols	0.016	mg/L
Sulfate	583	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	0.054	mg/L
Calcium	317	mg/L
Iron	2.59	mg/L
Magnesium	99	mg/L
Manganese	0.824	mg/L
Sodium	62.5	mg/L
Arsenic	<0.0025	mg/L
Barium	0.374	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	0.011	mg/L
Nickel	2	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.099	mg/L

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Sample No.: 7160

Sample Description: #66723

Date Taken: 11-28-89 1130

Date Received: 11-29-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 7161

Sample Description: #66707

Date Taken: 11-28-89 1715

Date Received: 11-29-89

Chloride	63	mg/L
Fluoride	0.24	mg/L
Nitrogen, Nitrate	33.6	mg/L
Phenols	0.017	mg/L
Sulfate	71	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	0.122	mg/L
Calcium	131	mg/L
Iron	0.162	mg/L
Magnesium	22.3	mg/L
Manganese	<0.020	mg/L
Sodium	49.8	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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Sample No.: 7161

Sample Description: #66707

Date Taken: 11-28-89 1715

Date Received: 11-29-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 7162

Sample Description: #66693 - Filtered

Date Taken: 11-28-89 1015

Date Received: 11-29-89

Aluminum, Dissolved	0.053	mg/L
Calcium, Dissolved	209	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	5.11	mg/L
Magnesium, Dissolved	29.6	mg/L
Manganese, Dissolved	2.68	mg/L
Sodium, Dissolved	65.8	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.025	mg/L

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Sample No.: 7163

Sample Description: #66725 - Filtered

Date Taken: 11-28-89 1615

Date Received: 11-29-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	235	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	0.098	mg/L
Magnesium, Dissolved	78.0	mg/L
Manganese, Dissolved	2.71	mg/L
Sodium, Dissolved	61.3	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	0.008	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 7164

Sample Description: #66723 - Filtered

Date Taken: 11-28-89 1130

Date Received: 11-29-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	308	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	1.87	mg/L
Magnesium, Dissolved	100	mg/L
Manganese, Dissolved	0.789	mg/L
Sodium, Dissolved	60.3	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	0.321	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	0.006	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.161	mg/L

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Sample No.: 7165

Sample Description: #66707 - Filtered

Date Taken: 11-28-89 1715

Date Received: 11-29-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	129	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	21.9	mg/L
Manganese, Dissolved	<0.020	mg/L
Sodium, Dissolved	52.9	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 7395

Sample Description: #66753

Date Taken: 11-29-89 0900

Date Received: 11-30-89

Chloride	<1	mg/L	
Fluoride	0.05	mg/L	
Nitrogen, Nitrate	0.02	mg/L	
Phenols	<0.005	mg/L	
Sulfate	3	mg/L	
Total Organic Carbon (TOC)	9	mg/L	
Total Organic Halogens	21	ug/L	Cl-
Aluminum	0.118	mg/L	
Calcium	0.440	mg/L	
Iron	0.133	mg/L	
Magnesium	0.135	mg/L	
Manganese	<0.020	mg/L	
Sodium	86.4	mg/L	
Arsenic	<0.0025	mg/L	
Barium	<0.200	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	<0.005	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	<0.005	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	0.026	mg/L	

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cc: Cindy Daniels, ASI

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Sample No.: 7395

Sample Description: #66753

Date Taken: 11-29-89 0900

Date Received: 11-30-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5 ug/L
1,1-Dichloroethane	<2.5 ug/L
1,2-Dichloroethane	<2.5 ug/L
Methylene chloride	<2.5 ug/L
Tetrachloroethene	<2.5 ug/L
Toluene	<2.5 ug/L
Trichloroethene	<2.5 ug/L

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Sample No.: 7396

Sample Description: #66773

Date Taken: 11-29-89 1030

Date Received: 11-30-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5 ug/L
1,1-Dichloroethane	<2.5 ug/L
1,2-Dichloroethane	<2.5 ug/L
Methylene chloride	<2.5 ug/L
Tetrachloroethene	<2.5 ug/L
Toluene	<2.5 ug/L
Trichloroethene	<2.5 ug/L

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Sample No.: 7397

Sample Description: #66719

Date Taken: 11-29-89 1145

Date Received: 11-30-89

Chloride	29	mg/L
Fluoride	0.17	mg/L
Nitrogen, Nitrate	0.31	mg/L
Phenols	0.016	mg/L
Sulfate	88	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	1.67	mg/L
Calcium	111	mg/L
Iron	4.54	mg/L
Magnesium	27.8	mg/L
Manganese	0.249	mg/L
Sodium	8.9	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	0.011	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.041	mg/L

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Sample No.: 7397

Sample Description: #66719

Date Taken: 11-29-89 1145

Date Received: 11-30-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5 ug/L
1,1-Dichloroethane	<2.5 ug/L
1,2-Dichloroethane	<2.5 ug/L
Methylene chloride	<2.5 ug/L
Tetrachloroethene	<2.5 ug/L
Toluene	<2.5 ug/L
Trichloroethene	<2.5 ug/L

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Sample No.: 7398

Sample Description: #66749

Date Taken: 11-29-89 1145

Date Received: 11-30-89

Chloride	29	mg/L
Fluoride	0.17	mg/L
Nitrogen, Nitrate	0.16	mg/L
Phenols	<0.005	mg/L
Sulfate	83	mg/L
Total Organic Carbon (TOC)	<1	mg/L
Total Organic Halogens	<10	ug/L Cl-
Aluminum	0.598	mg/L
Calcium	102	mg/L
Iron	3.69	mg/L
Magnesium	25.7	mg/L
Manganese	0.216	mg/L
Sodium	104	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.029	mg/L

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Sample No.: 7303

Sample Description: #66749

Date Taken: 11-29-89 1145

Date Received: 11-30-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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Sample No.: 7399

Sample Description: #66721

Date Taken: 11-29-89 1615

Date Received: 11-30-89

Chloride	46	mg/L
Fluoride	0.12	mg/L
Nitrogen, Nitrate	0.04	mg/L
Phenols	<0.005	mg/L
Sulfate	265	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	23	ug/L Cl-
Aluminum	0.083	mg/L
Calcium	175	mg/L
Iron	7.75	mg/L
Magnesium	33.8	mg/L
Manganese	0.302	mg/L
Sodium	131	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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Sample No.: 7339

Sample Description: #66721

Date Taken: 11-29-89 1615

Date Received: 11-30-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5 ug/L
1,1-Dichloroethane	<2.5 ug/L
1,2-Dichloroethane	<2.5 ug/L
Methylene chloride	<2.5 ug/L
Tetrachloroethene	<2.5 ug/L
Toluene	<2.5 ug/L
Trichloroethene	<2.5 ug/L

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Sample No.: 7400

Sample Description: #66753 - Filtered

Date Taken: 11-29-89 0900

Date Received: 11-30-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	0.125	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	0.060	mg/L
Manganese, Dissolved	<0.020	mg/L
Sodium, Dissolved	<0.050	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 7401

Sample Description: #66719 - Filtered

Date Taken: 11-29-89 1145

Date Received: 11-30-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	99.1	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	1.94	mg/L
Magnesium, Dissolved	24.1	mg/L
Manganese, Dissolved	0.207	mg/L
Sodium, Dissolved	16.1	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.027	mg/L

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Sample No.: 7402

Sample Description: #66749 - Filtered

Date Taken: 11-29-89 1145

Date Received: 11-30-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	97.7	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	1.99	mg/L
Magnesium, Dissolved	23.5	mg/L
Manganese, Dissolved	0.196	mg/L
Sodium, Dissolved	15.4	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.026	mg/L

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Sample No.: 7403

Sample Description: #66721 - Filtered

Date Taken: 11-29-89 1615

Date Received: 11-30-89

Aluminum, Dissolved	0.051	mg/L
Calcium, Dissolved	167	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	7.40	mg/L
Magnesium, Dissolved	32.4	mg/L
Manganese, Dissolved	0.319	mg/L
Sodium, Dissolved	40.2	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 7605

Sample Description: #66776

Date Taken: 12-01-89

Date Received: 12-01-89

Chloride	100	mg/L
Fluoride	0.30	mg/L
Nitrogen, Nitrate	0.21	mg/L
Sulfate	525	mg/L
Total Organic Halogens	15	ug/L Cl-

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cc: Cindy Daniels, ASI

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Sample No.: 7606

Sample Description: #66777

Date Taken: 12-01-89

Date Received: 12-01-89

Chloride	49	mg/L
Fluoride	0.46	mg/L
Nitrogen, Nitrate	<0.02	mg/L
Sulfate	15	mg/L
Total Organic Halogens	13	ug/L Cl-

Jackie Webster

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Formerly: Howard Laboratories, Inc

ANALYTICAL REPORT

William Hayes
WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

01-26-90

PAGE 1

Sample No.: 7607

Sample Description: #66757

Date Taken: 12-01-89 1000

Date Received: 12-01-89

Chloride	19	mg/L
Fluoride	<0.02	mg/L
Nitrogen, Nitrate	0.30	mg/L
Phenols	<0.005	mg/L
Sulfate	1	mg/L
Total Organic Carbon (TOC)	<1	mg/L
Total Organic Halogens	46	ug/L Cl-
Aluminum	0.060	mg/L
Calcium	<0.050	mg/L
Iron	0.050	mg/L
Magnesium	3.1	mg/L
Manganese	<0.020	mg/L
Sodium	99.4	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

Jackie Webster
Jackie Webster
Division Manager

cc: Cindy Daniels, ASI

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01-26-90

PAGE 2

Sample No.: 7607

Sample Description: #66757

Date Taken: 12-01-89 1000

Date Received: 12-01-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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PAGE 3

Sample No.: 7608

Sample Description: #66731

Date Taken: 11-30-89 1115

Date Received: 12-01-89

Chloride	20	mg/L
Fluoride	0.92	mg/L
Nitrogen, Nitrate	0.23	mg/L
Phenols	0.009	mg/L
Sulfate	60	mg/L
Total Organic Carbon (TOC)	<1	mg/L
Total Organic Halogens	13	ug/L Cl-
Aluminum	3.18	mg/L
Calcium	78.4	mg/L
Iron	3.67	mg/L
Magnesium	23.1	mg/L
Manganese	0.274	mg/L
Sodium	17.0	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	0.007	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.188	mg/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 7608

Sample Description: #66731

Date Taken: 11-30-89 1115

Date Received: 12-01-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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PAGE 5

Sample No.: 7609

Sample Description: #66735

Date Taken: 11-30-89 1600

Date Received: 12-01-89

Chloride	21	mg/L
Fluoride	0.39	mg/L
Nitrogen, Nitrate	0.13	mg/L
Phenols	<0.005	mg/L
Sulfate	110	mg/L
Total Organic Carbon (TOC)	4	mg/L
Total Organic Halogens	< 10	ug/L Cl-
Aluminum	0.078	mg/L
Calcium	116	mg/L
Iron	4.22	mg/L
Magnesium	25.2	mg/L
Manganese	0.156	mg/L
Sodium	38.4	mg/L
Arsenic	<0.0025	mg/L
Barium	0.371	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	0.020	mg/L

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ANALYTICAL REPORT

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COMPANY OF OHIO
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Cincinnati OH 45239

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Sample No.: 7609

Sample Description: #66735

Date Taken: 11-30-89 1600

Date Received: 12-01-89

VOLATILE COMPOUNDS

METHOD 8240

[illegible]roethane	<2.5	ug/L
[illegible]Dichloroethane	<2.5	ug/L
[illegible]ethylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Cincinnati OH 45239

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Sample No.: 7610

Sample Description: #66755

Date Taken: 11-30-89 1700

Date Received: 12-01-89

Chloride	<1	mg/L
	0.11	mg/L
Nitrate	0.14	mg/L
	0.006	mg/L
	2	mg/L
Total Organic Carbon (TOC)	<1	mg/L
Total Organic Halogens	29	ug/L Cl-
Aluminum	0.064	mg/L
Calcium	<0.050	mg/L
Iron	<0.050	mg/L
Magnesium	0.040	mg/L
Manganese	<0.020	mg/L
Sodium	27.0	mg/L
Arsenic	<0.0025	mg/L
Barium	<0.200	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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PAGE 8

Sample No.: 7610

Sample Description: #66755

Date Taken: 11-30-89 1700

Date Received: 12-01-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 7611

Sample Description: #66733

Date Taken: 11-30-89 1215

Date Received: 12-01-89

Chloride	12	mg/L
Fluoride	1.18	mg/L
Nitrogen, Nitrate	0.10	mg/L
Phenols	0.044	mg/L
Sulfate	9	mg/L
Total Organic Carbon (TOC)	4	mg/L
Total Organic Halogens	< 10	ug/L Cl-
Aluminum	0.067	mg/L
Calcium	76.7	mg/L
Iron	2.37	mg/L
Magnesium	21.2	mg/L
Manganese	0.370	mg/L
Sodium	35.7	mg/L
Arsenic	0.004	mg/L
Barium	0.216	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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PAGE 10

Sample No.: 7611

Sample Description: #66733

Date Taken: 11-30-89 1215

Date Received: 12-01-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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PAGE 11

Sample No.: 7612

Sample Description: #66751

Date Taken: 11-30-89 1215

Date Received: 12-01-89

Chloride	13	mg/L	
Fluoride	0.19	mg/L	
Nitrogen, Nitrate	0.06	mg/L	
Phenols	<0.005	mg/L	
Sulfate	9	mg/L	
Total Organic Carbon (TOC)	4	mg/L	
Total Organic Halogens	< 10	ug/L	Cl-
Aluminum	0.064	mg/L	
Calcium	73.9	mg/L	
Iron	2.43	mg/L	
Magnesium	20.8	mg/L	
Manganese	0.365	mg/L	
Sodium	38.0	mg/L	
Arsenic	0.004	mg/L	
Barium	0.237	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	<0.005	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	<0.005	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	<0.020	mg/L	

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 7612

Sample Description: #66751

Date Taken: 11-30-89 1215

Date Received: 12-01-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 7613

Sample Description: #66775 - Trip Blanks

Date Taken: 11-30-89 900

Date Received: 12-01-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
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Sample No.: 7614

Sample Description: Blanks - Lot #890920Y

Date Taken: NA

Date Received: 12-01-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

Jackie Webster 420
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ANALYTICAL REPORT

William Hayes
WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

01-26-90

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Sample No.: 7615

Sample Description: #66757 - Filtered

Date Taken: 12-01-89 1000

Date Received: 12-01-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	0.373	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	0.051	mg/L
Magnesium, Dissolved	0.192	mg/L
Manganese, Dissolved	<0.020	mg/L
Sodium, Dissolved	0.144	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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ANALYTICAL REPORT

01-26-90

WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
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Sample No.: 7616

Sample Description: #66731 - Filtered

Date Taken: 11-30-89 1115

Date Received: 12-01-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	65.4	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	1.35	mg/L
Magnesium, Dissolved	23.0	mg/L
Manganese, Dissolved	0.270	mg/L
Sodium, Dissolved	12.7	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	0.186	mg/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 7617

Sample Description: #66735 - Filtered

Date Taken: 11-30-89 1600

Date Received: 12-01-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	119	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	3.88	mg/L
Magnesium, Dissolved	24.4	mg/L
Manganese, Dissolved	0.151	mg/L
Sodium, Dissolved	12.3	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 7618

Sample Description: #66755 - Filtered

Date Taken: 11-30-89 1700

Date Received: 12-01-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	0.390	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	<0.050	mg/L
Magnesium, Dissolved	0.095	mg/L
Manganese, Dissolved	<0.020	mg/L
Sodium, Dissolved	<0.050	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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ANALYTICAL REPORT

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 7619

Sample Description: #66733 - Filtered

Date Taken: 11-30-89 1215

Date Received: 12-01-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	83.0	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	2.21	mg/L
Magnesium, Dissolved	21.3	mg/L
Manganese, Dissolved	0.374	mg/L
Sodium, Dissolved	22.7	mg/L
Arsenic, Dissolved	0.004	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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WESTINGHOUSE MATERIALS
COMPANY OF OHIO
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Sample No.: 7620

Sample Description: #66751 - Filtered

Date Taken: 11-30-89 1215

Date Received: 12-01-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	73.3	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	2.19	mg/L
Magnesium, Dissolved	20.5	mg/L
Manganese, Dissolved	0.377	mg/L
Sodium, Dissolved	8.50	mg/L
Arsenic, Dissolved	0.003	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

Jackie Webster
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Division Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc
Dayton Division
3601 South Dixie Drive
Dayton, OH 45439
Tel: (513) 294-6856
Fax: (513) 294-7816

Formerly: Howard Laboratories, Inc

ANALYTICAL REPORT

William Hayes
WESTINGHOUSE MATERIALS
COMPANY OF OHIO
P.O. Box 398704
Cincinnati OH 45239

01-26-90

PAGE 1

Sample No.: 8202

Sample Description: #66805

Date Taken: 12-04-89 1415

Date Received: 12-05-89

Lead	<0.200	mg/L
Lead, Dissolved	<0.200	mg/L

DUPLICATE

Jackie Webster
Division Manager

cc: Cindy Daniels, ASI

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PAGE 1

Sample No.: 8652

Sample Description: #66737

Date Taken: 12-07-89 0930

Date Received: 12-07-89

Chloride	36	mg/L
Fluoride	0.24	mg/L
Nitrogen, Nitrate	0.41	mg/L
Phenols	0.025	mg/L
Sulfate	105	mg/L
Total Organic Carbon (TOC)	1	mg/L
Total Organic Halogens	< 10	ug/L Cl-
Aluminum	0.169	mg/L
Calcium	110	mg/L
Iron	4.86	mg/L
Magnesium	31.0	mg/L
Manganese	0.422	mg/L
Sodium	38.3	mg/L
Arsenic	<0.0025	mg/L
Barium	0.328	mg/L
Beryllium	<0.010	mg/L
Chromium, Total	<0.005	mg/L
Cobalt	<0.025	mg/L
Copper	<0.025	mg/L
Lead	<0.005	mg/L
Nickel	<0.005	mg/L
Silver	<0.001	mg/L
Vanadium	<0.050	mg/L
Zinc	<0.020	mg/L

Jackie Webster
Jackie Webster
Division Manager

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cc: Cindy Daniels, ASI

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Sample No.: 8652

Sample Description: #66737

Date Taken: 12-07-89 0930

Date Received: 12-07-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

Jackie Webster
Jackie Webster
Division Manager

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Sample No.: 8653

Sample Description: #66739

Date Taken: 12-07-89 1025

Date Received: 12-07-89

Chloride	26	mg/L	
Fluoride	0.25	mg/L	
Nitrogen, Nitrate	0.06	mg/L	
Phenols	0.008	mg/L	
Sulfate	81	mg/L	
Total Organic Carbon (TOC)	2	mg/L	
Total Organic Halogens	< 10	ug/L	Cl-
Aluminum	0.062	mg/L	
Calcium	93.1	mg/L	
Iron	2.77	mg/L	
Magnesium	25.7	mg/L	
Manganese	0.399	mg/L	
Sodium	18.3	mg/L	
Arsenic	<0.0025	mg/L	
Barium	<0.200	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	<0.005	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	<0.005	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	<0.020	mg/L	

Jackie Webster
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PAGE 4

Sample No.: 8653

Sample Description: #66739

Date Taken: 12-07-89 1025

Date Received: 12-07-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
[illegible]ylene chloride	<2.5	ug/L
[illegible]achloroethene	<2.5	ug/L
[illegible]uene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

Jackie Webster

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Sample No.: 8654

Sample Description: #66741

Date Taken: 12-07-89 1110

Date Received: 12-07-89

Chloride	13	mg/L	
Fluoride	0.22	mg/L	
Nitrogen, Nitrate	0.03	mg/L	
Phenols	<0.005	mg/L	
Sulfate	39	mg/L	
Total Organic Carbon (TOC)	1	mg/L	
Total Organic Halogens	< 10	ug/L	Cl-
Aluminum	0.072	mg/L	
Calcium	82.4	mg/L	
Iron	2.37	mg/L	
Magnesium	21.1	mg/L	
Manganese	0.430	mg/L	
Sodium	9.2	mg/L	
Arsenic	<0.0025	mg/L	
Barium	<0.200	mg/L	
Beryllium	<0.010	mg/L	
Chromium, Total	<0.005	mg/L	
Cobalt	<0.025	mg/L	
Copper	<0.025	mg/L	
Lead	<0.005	mg/L	
Nickel	<0.005	mg/L	
Silver	<0.001	mg/L	
Vanadium	<0.050	mg/L	
Zinc	<0.020	mg/L	

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Sample No.: 8654

Sample Description: #66741

Date Taken: 12-07-89 1110

Date Received: 12-07-89

VOLATILE COMPOUNDS

METHOD 8240

Acetone	<2.5	ug/L
1,1-Dichloroethane	<2.5	ug/L
1,2-Dichloroethane	<2.5	ug/L
Methylene chloride	<2.5	ug/L
Tetrachloroethene	<2.5	ug/L
Toluene	<2.5	ug/L
Trichloroethene	<2.5	ug/L

Jackie Webster
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01-26-90

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Sample No.: 8655

Sample Description: #66737 - Filtered

Date Taken: 12-07-89 0930

Date Received: 12-07-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	115	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	4.74	mg/L
Magnesium, Dissolved	32.7	mg/L
Manganese, Dissolved	0.417	mg/L
Sodium, Dissolved	31.1	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.400	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 8656

Sample Description: #66739 - Filtered

Date Taken: 12-07-89 1025

Date Received: 12-07-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	95.5	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	2.82	mg/L
Magnesium, Dissolved	27.4	mg/L
Manganese, Dissolved	0.394	mg/L
Sodium, Dissolved	17.2	mg/L
\rsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

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Sample No.: 8657

Sample Description: #66741 - Filtered

Date Taken: 12-07-89 1110

Date Received: 12-07-89

Aluminum, Dissolved	<0.050	mg/L
Calcium, Dissolved	85.4	mg/L
Cobalt, Dissolved	<0.025	mg/L
Iron, Dissolved	2.24	mg/L
Magnesium, Dissolved	22.3	mg/L
Manganese, Dissolved	0.417	mg/L
Sodium, Dissolved	6.70	mg/L
Arsenic, Dissolved	<0.0025	mg/L
Barium, Dissolved	<0.200	mg/L
Beryllium, Dissolved	<0.010	mg/L
Chromium, Dissolved	<0.005	mg/L
Copper, Dissolved	<0.025	mg/L
Lead, Dissolved	<0.005	mg/L
Nickel, Dissolved	<0.005	mg/L
Silver, Dissolved	<0.001	mg/L
Vanadium, Dissolved	<0.050	mg/L
Zinc, Dissolved	<0.020	mg/L

Jackie Webster
Jackie Webster
Division Manager