N62269.AR.000381
NAWC WARMINSTER
5090.3a

Brown & Root Environmental

A Division of Halliburton NUS Corporation

661 Andersen Drive
Pittsburgh, PA 15220-2745

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C-49-09-6-074

September 11, 1996

Project Number 1412

Mr. Lonnie Monaco, Code 1823
U.S. Department of the Navy
Naval Facilities Engineering Company
Northern Division, Mail Stop 82
10 Industrial Highway
Lester, Pennsylvania 19113-2090

SUBJECT: Technical Memorandum
Site 4 Removal Action
Supplemental Trench 7 Verification Sampling Results

Dear Mr. Monaco:

The following summarizes the results of the supplemental verification sampling performed for Trench 7 during the Site 4 Removal Action. Two additional samples were taken from the trench following the first round of trench sampling. One sample (TR07-12) was taken from the location where manganese was detected at a level above the target concentration during the first round of sampling (sampling location TR07-06), as shown in the attached sketch map. The other sample (TR07-13) was taken from the eastern end of trench 7, following additional excavation to remove wastes found at this end of the trench. Sample TR07-12 was analyzed for manganese, as this was the only compound found at a level exceeding target concentrations in sample TR07-06, while TR07-13 was analyzed for the indicator parameters, including purgeable halocarbons, PAH's, PCB's, and thallium. Raw analytical data from the lab is attached to this memo.

At the location of TR07-12 (and TR07-06), manganese, at 3,740 mg/kg, continues to be present at a concentration above the currently established background level of 2,080 mg/kg and above the target concentration established for this compound. Manganese is a fairly common constituent of sedimentary rocks, and the brownish color noted for many of the finer-grained rock units at NAWC is characteristic of manganese-bearing rocks, thus the manganese concentrations found at this location may be reflective of background conditions that fall outside of the range of the data set used to establish background levels.

For sample TR07-13, there were no positive detections of any VOC's, PCB's, or PAH's, and the thallium concentration of 1.4 mg/kg is within the background range and well below the target concentration of 2.9 mg/kg.

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Based on the analytical results, no additional excavation of soils is needed at sampling point TR07-13. At sampling point TR07-12, manganese continues to be present at a level above the established background range and above the target concentration. This detection could either be treated as a background outlier statistically, or additional excavation could be undertaken, possibly excavating to bedrock at this location if the depth to bedrock is not excessive. If soils are removed to the bedrock surface at the location of TR07-12, the trench should be OK to backfill without additional sampling.

If you have any questions regarding the above information or would like to discuss it further, please call me at (412) 921-8778.

Sincerely yours,

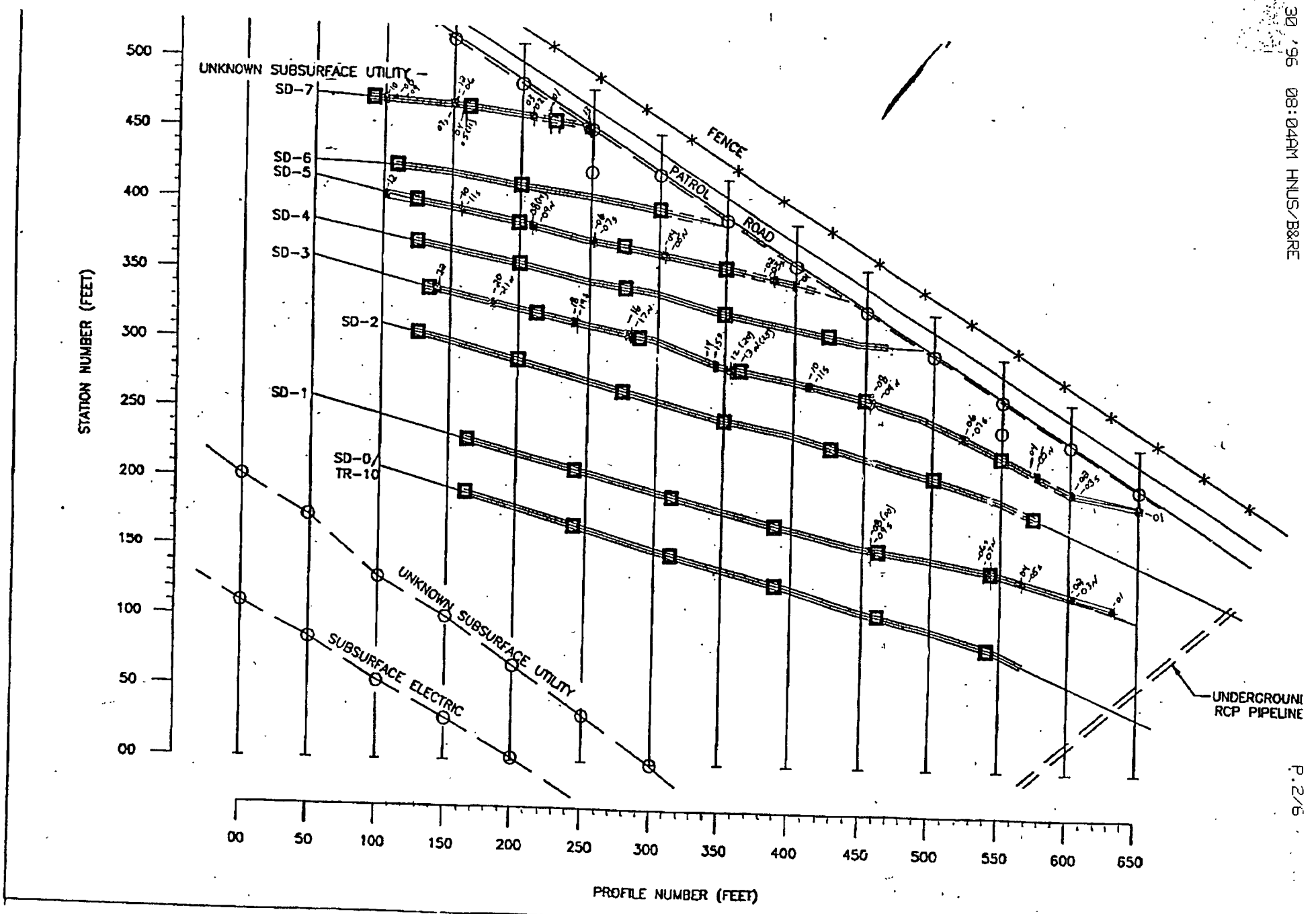
Jeffrey P. Orient, P.G.
Project Manager

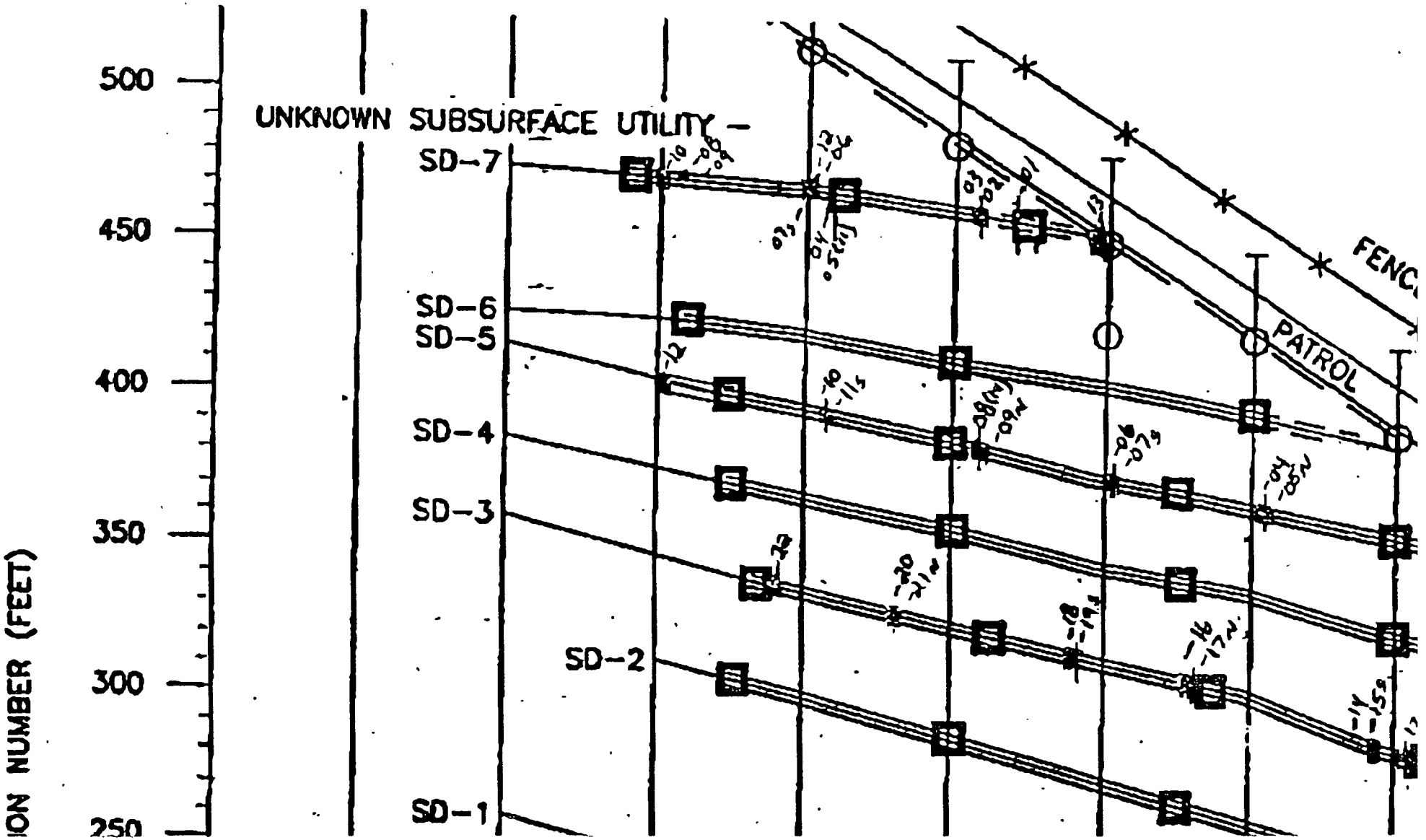
JPO/sic

Attachment

c: T. Ames
J. Dale
S. Lehman
G. Glenn
N. Teamerson
D. Kennedy
D. Ostrauskas
E. Leonard
File 1412

SAMPLE LOCATION MAP


UNKNOWN SUBSURFACE UTILITY
SD-7
SD-6
SD-5
SD-4
SD-3
SD-2
SD-1
SD-0/
TR-10
FENCE
PATROL
ROAD
UNKNOWN SUBSURFACE UTILITY
SUBSURFACE ELECTRIC
UNDERGROUND
RCP PIPELINE
STATION NUMBER (FEET)
PROFILE NUMBER (FEET)
00
50
100
150
200
250
300
350
400
450
500
550
600
650


UNKNOWN SUBSURFACE UTILITY
SD-7
SD-6
SD-5
SD-4
SD-3
SD-2
SD-1
PATROL
500
450
400
350
300
250
ION NUMBER (FEET)

CALCULATION WORKSHEET Order No. 19116 (01-91)

PAGE _____ OF _____

CLIENT		JOB NUMBER	
SUBJECT	TR07 - sample locations		
BASED ON		DRAWING NUMBER	
BY	CHECKED BY	APPROVED BY	DATE

	Profile	station
TR07-01	225	460
TR07-02	215	460
TR07-03	215	455
TR07-04	155	470
TR07-05	155	475
TR07-06	150	470
TR07-07	150	465
TR07-08	105	475
TR07-09	105	480
TR07-10	100	475
TR07-11	155	475
TR07-12	150	465
TR07-13	250	?

ANALYTICAL RESULTS

Client Sample ID:		W-TR03-22		W-TR03-23		W-TR03-24		W-TR03-26		W-TR07-13	
Job Number & Lab Sample ID:		A96-4114 A6411402		A96-4114 A6411422		A96-4114 A6411423		A96-4114 A6411424		A96-4114 A6411401	
Sample Date:		08/26/96		08/26/96		08/26/96		08/26/96		08/26/96	
Analyte (UG/KG)	RL	Result		Result		Result		Result		Result	
METHOD 8260 - TCL VOLATILE ORGANICS											
1,2-Dichloroethane-D4	80-120	NA		NA		NA		82		NA	

Analyte (UG/KG)	RL	Result		Result		Result		Result		Result	
METHOD 8260 - PURGEABLE HALOCARBONS											
Bromodichloromethane	5	5	U	5	U	5	U	NA		5	U
Bromoform	5	5	U	5	U	5	U	NA		5	U
Bromomethane	10	10	U	10	U	10	U	NA		10	U
Carbon Tetrachloride	5	5	U	5	U	5	U	NA		5	U
Chlorobenzene	5	5	U	5	U	5	U	NA		5	U
Chloroethane	10	10	U	10	U	10	U	NA		10	U
2-Chloroethylvinyl ether	10	10	U	10	U	10	U	NA		10	U
Chloroform	5	5	U	5	U	5	U	NA		5	U
Chloromethane	10	10	U	10	U	10	U	NA		10	U
Dibromochloromethane	5	5	U	5	U	5	U	NA		5	U
1,2-Dichlorobenzene	5	5	U	5	U	5	U	NA		5	U
1,3-Dichlorobenzene	5	5	U	5	U	5	U	NA		5	U
1,4-Dichlorobenzene	5	5	U	5	U	5	U	NA		5	U
1,1-Dichloroethane	5	5	U	5	U	5	U	NA		5	U
1,2-Dichloroethane	5	5	U	5	U	5	U	NA		5	U
1,1-Dichloroethene	5	5	U	5	U	5	U	NA		5	U
cis-1,2-Dichloroethene	5	5	U	5	U	5	U	NA		5	U
trans-1,2-Dichloroethene	5	5	U	5	U	5	U	NA		5	U
1,2-Dichloropropane	5	5	U	5	U	5	U	NA		5	U
cis-1,3-Dichloropropene	5	5	U	5	U	5	U	NA		5	U
trans-1,3-Dichloropropene	5	5	U	5	U	5	U	NA		5	U
Methylene chloride	5	4	BJ	4	BJ	3	BJ	NA		4	BJ
1,1,2,2-Tetrachloroethane	5	5	U	5	U	5	U	NA		5	U
Tetrachloroethene	5	5	U	5	U	5	U	NA		5	U
1,1,1-Trichloroethane	5	5	U	5	U	5	U	NA		5	U
1,1,2-Trichloroethane	5	5	U	5	U	5	U	NA		5	U
Trichloroethene	5	5	U	5	U	5	U	NA		5	U
Trichlorofluoromethane	5	5	U	5	U	5	U	NA		5	U
Vinyl chloride	10	10	U	10	U	10	U	NA		10	U
INTERNAL STANDARDS											
Bromochloromethane	50-200	90		74		82		NA		80	
1,4-Difluorobenzene	50-200	75		65		71		NA		66	
Chlorobenzene-D5	50-200	71		61		67		NA		63	
SURROGATES											
Toluene-D8	81-117	116		114		116		NA		116	

* Indicates Result is Outside QC Limits
NA = N t Applicable

Client Sample ID:		W-TR03-23		W-TR03-24		W-TR03-26		W-TR07-13	
Job Number & Lab Sample ID:		A96-4114 A6411422		A96-4114 A6411423		A96-4114 A6411424		A96-4114 A6411401	
Sample Date:		08/26/96		08/26/96		08/26/96		08/26/96	
Analyte (UG/KG)	RL	Result		Result		Result		Result	
METHOD 8270-NSL POLYNUCLEAR AROMATIC HYDROCARBONS									
Acenaphthene	330	330	U	330	U	NA		330	U
Acenaphthylene	330	330	U	330	U	NA		330	U
Anthracene	330	330	U	330	U	NA		330	U
Benzo(a)anthracene	330	330	U	330	U	NA		330	U
Benzo(b)fluoranthene	330	330	U	330	U	NA		330	U
Benzo(k)fluoranthene	330	330	U	330	U	NA		330	U
Benzo(ghi)perylene	330	330	U	330	U	NA		330	U
Benzo(a)pyrene	330	330	U	330	U	NA		330	U
Chrysene	330	330	U	330	U	NA		330	U
Dibenzo(a,h)anthracene	330	330	U	330	U	NA		330	U
Fluoranthene	330	330	U	330	U	NA		330	U
Fluorene	330	330	U	330	U	NA		330	U
Indeno(1,2,3-cd)pyrene	330	330	U	330	U	NA		330	U
2-Methylnaphthalene	330	330	U	330	U	NA		330	U
Naphthalene	330	330	U	330	U	NA		330	U
Phenanthrene	330	330	U	330	U	NA		330	U
Pyrene	330	330	U	330	U	NA		330	U
INTERNAL STANDARDS									
1,4-Dichlorobenzene-D4	50-200	113		86		NA		99	
Naphthalene-D8	50-200	113		89		NA		105	
Acenaphthene-D10	50-200	120		87		NA		106	
Phenanthrene-D10	50-200	114		85		NA		110	
Chrysene-D12	50-200	97		68		NA		88	
Perylene-D12	50-200	105		74		NA		102	
SURROGATES									
Nitrobenzene-D5	23-120	75		74		NA		56	
2-Fluorobiphenyl	30-115	84		86		NA		72	
T rphenyl-D14	18-137	99		108		NA		99	
Phenol-D5	24-113	73		78		NA		61	
2-Fluorophenol	25-121	69		74		NA		59	
2,4,6-Tribromophenol	19-122	90		87		NA		89	

* Indicates Result is Outside QC Limits
NA = Not Applicable

08/29/96 15:41

Client Sample ID:	W-TR03-23	W-TR03-24	W-TR03-26	W-TR07-13
Job Number & Lab Sample ID:	A96-4114 A6411422	A96-4114 A6411423	A96-4114 A6411424	A96-4114 A6411401
Sample Date:	08/26/96	08/26/96	08/26/96	08/26/96

Analyte (UG/KG)	RL	Result	Result	Result	Result
HOD 8080 - POLYCHLORINATED BIPHENYLS					
Aroclor 1016	40	40 U	40 U	NA	40 U
Aroclor 1221	80	80 U	80 U	NA	80 U
Aroclor 1232	40	40 U	40 U	NA	40 U
Aroclor 1242	40	40 U	40 U	NA	40 U
Aroclor 1248	40	40 U	40 U	NA	40 U
Aroclor 1254	40	40 U	40 U	NA	40 U
Aroclor 1260	40	40 U	40 U	NA	40 U
SURROGATES					
Tetrachloro-m-xylene	27-132	87	90	NA	78
Decachlorobiphenyl	58-150	90	92	NA	84

Analyte (UG/KG)	RL	Result	Result	Result	Result
HOD 8080 - TCL PESTICIDES/PCBS					
Aldrin	8.0	NA	NA	8.0 U	NA
alpha-BHC	8.0	NA	NA	8.0 U	NA
beta-BHC	8.0	NA	NA	8.0 U	NA
gamma-BHC (Lindane)	8.0	NA	NA	8.0 U	NA
delta-BHC	8.0	NA	NA	8.0 U	NA
Chlordane	80	NA	NA	80 U	NA
4,4'-DDD	16	NA	NA	16 U	NA
4,4'-DDE	16	NA	NA	16 U	NA
4,4'-DDT	16	NA	NA	16 U	NA
Dieldrin	16	NA	NA	16 U	NA
Endosulfan I	16	NA	NA	16 U	NA
Endosulfan II	16	NA	NA	16 U	NA
Endosulfan Sulfate	16	NA	NA	16 U	NA
Endrin	16	NA	NA	16 U	NA
Endrin aldehyde	32	NA	NA	32 U	NA
Heptachlor	8.0	NA	NA	8.0 U	NA
Heptachlor epoxide	8.0	NA	NA	8.0 U	NA
Methoxychlor	80	NA	NA	80 U	NA
Toxaphene	160	NA	NA	160 U	NA
Aroclor 1016	40	NA	NA	40 U	NA
Aroclor 1221	80	NA	NA	80 U	NA
Aroclor 1232	40	NA	NA	40 U	NA
Aroclor 1242	40	NA	NA	40 U	NA
Aroclor 1248	40	NA	NA	40 U	NA
Aroclor 1254	40	NA	NA	40 U	NA
Aroclor 1260	40	NA	NA	40 U	NA

* Indicates Result is Outside QC Limits

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Page:

		Client Sample ID:	W-TR03-23	W-TR03-24	W-TR03-26	W-TR07-13	
		Job Number & Lab Sample ID:	A96-4114 A6411422	A96-4114 A6411423	A96-4114 A6411424	A96-4114 A6411401	
		Sample Date:	08/26/96	08/26/96	08/26/96	08/26/96	
Analyte	UNITS OF MEASURE	RL	Result	Result	Result	Result	
IAL METALS							
Thallium - Total	MG/KG	0.36	1.0	1.6	NA	1.4	
TAL NSL METALS							
Aluminum - Total	MG/KG	0.77	NA	NA	9910	NA	
Antimony - Total	MG/KG	0.57	NA	NA	0.92	NA	
Arsenic - Total	MG/KG	0.28	NA	NA	0.36	NA	
Barium - Total	MG/KG	0.024	NA	NA	101	NA	
Beryllium - Total	MG/KG	0.010	NA	NA	2.2	NA	
Cadmium - Total	MG/KG	0.021	NA	NA	0.024 U	NA	
Calcium - Total	MG/KG	0.54	NA	NA	4000	NA	
Chromium - Total	MG/KG	0.26	NA	NA	16.2	NA	
Cobalt - Total	MG/KG	0.12	NA	NA	11.8	NA	
Copper - Total	MG/KG	0.087	NA	NA	20.6	NA	
Iron - Total	MG/KG	2.4	NA	NA	18500	NA	
Lead - Total	MG/KG	0.13	NA	NA	11.0	NA	
Magnesium - Total	MG/KG	0.87	NA	NA	6320	NA	
Manganese - Total	MG/KG	0.036	NA	NA	197	NA	
Nickel - Total	MG/KG	0.25	NA	NA	22.4	NA	
Potassium - Total	MG/KG	9.3	NA	NA	3110	NA	
Selenium - Total	MG/KG	0.28	NA	NA	1.2	NA	
Silver - Total	MG/KG	0.25	NA	NA	0.29 U	NA	
Sodium - Total	MG/KG	56.8	NA	NA	131	NA	
Thallium - Total	MG/KG	0.36	NA	NA	1.2	NA	
Vanadium - Total	MG/KG	0.087	NA	NA	15.0	NA	
Zinc - Total	MG/KG	0.024	NA	NA	88.6	NA	

Indicates Result is Outside QC Limits
A = Not Applicable

Recra LabNet

08/05/96 10:27

AMALYTICAL RESULTS

Client Sample ID:			W-TR03-02	W-TR07-12			
Job Number & Lab Sample ID:			A96-4207 A6420714	A96-4207 A6420713			
Sample Date:			08/28/96	08/26/96			
Analyte	UNITS OF MEASURE	RL	Result	Result			
TOTAL METALS							
Thallium - Total	MG/KG	0.36	2.4	NA			
Manganese - Total	MG/KG	0.036	NA	3740			

* Indicates Result is Outside QC Limits
NA = Not Applicable

09/09/96 16:19 ☎ 004/009