N62269.AR.000421
NAWC WARMINSTER
5090.3a
FEB 17 Fost
661 And
Pittsburgh, PA 15220-2745
BROWN & ROOT ENVIRONMENTAL

Brown & Root Environmental

(412) 921-7090
FAX: (412) 921-4040

117

February 14, 1997

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

REFERENCE: CLEAN Contract No. N62472-90-D-1298
Contract Task Order (CTO) No. 159

SUBJECT: Technical Memorandum
Site 4 Removal Action
Summary Report - Verification Sampling Results
Naval Air Warfare Center (NAWC), Warminster, Pennsylvania

Dear Mr. Monaco:

The following summarizes the results of the verification sampling performed for the Site 4 Removal Action. A total of 151 samples (including 11 duplicates) were taken from the trenches. Sample locations are presented in the verification reports previously submitted for each trench, and were selected based on a frequency of 1 sample per 50 feet of trench, with an additional sample taken at each end of each trench. Most samples were analyzed for the indicator parameters specified in the Verification Sampling and Analysis Plan (VSAP) (Attachment A), *including purgeable halocarbons, PAH's, PCB's, and thallium.* In addition, 42 samples, including 3 duplicates (28% of the total number of samples taken) were analyzed for the full suite of analytical parameters (TCL volatiles and semivolatiles, TAL metals, and pesticides/PCB's) as part of the overall sampling strategy of analyzing at least 20% of the samples for full TCL/TAL parameters. Validated analytical data for each trench for the entire verification sampling effort associated with the removal action is attached to this memo (Attachment B). Tables 1 through 8 summarize the occurrence and distribution of detected chemicals for soils remaining in-place in each trench Table 9 summarizes the occurrence and distribution of detected chemicals in soils remaining in-place for the entire verification sampling effort.

Sample analysis results were compared to target concentrations developed for the potential contaminants of concern. Target concentrations were developed for all analytes detected, following the methodology specified in the VSAP. A complete listing of all target concentrations developed is presented in Table 10 and trench-specific subsets of the target concentrations are presented in summary tables 1 through 9.

Prior to comparison with target concentrations, metals results underwent an initial screening against background levels (Table 9), with only those metals results that exceeded background carried through for comparison with the target concentrations. Organics results were directly compared to target concentrations without any screening.

For all of the samples, any exceedances of the analyte-specific target concentrations were followed up by additional excavation of the area from which the sample was obtained. Where the additional excavation extended down to bedrock (typically for trench bottom samples), no follow-up sampling was performed, since no soils remained. Where additional soils remained after the additional excavation (sidewall/end samples), supplemental verification samples were obtained and analyzed for the compound(s) that initially exceeded the target concentration, to verify that sufficient excavation had been performed. As a result, there were no exceedances of any of target concentrations for any parameters in the final samples from the areas selected for sampling.

Statistical Evaluation

Analytical results were evaluated statistically to determine the range, mean, and upper 95% confidence level of the mean concentrations (95% UCL) of the soils remaining in place. In this evaluation, soil sampling results from areas where there were initial detections above target concentrations, followed up by excavation to bedrock, were discarded since there are no longer any soils at that location. For sampling locations where initial detections above target concentrations were followed up by limited excavation and resampling of the soils for the compound(s) that initially exceeded the target levels, the sampling results were included, with the followup sampling data substituted for the compounds initially detected above target levels. The statistical method employed to determine the 95% UCLs was taken from U. S. EPA's Methods for Evaluating the Attainment of Cleanup Standards Volume I: Soils and Solid Media (EPA 1989), and employed the following formula for upper one-sided confidence interval for the true mean contamination:

$$95\%\ UCL = \bar{x} + [(t_{0.95,\, n-1})\ (S_x)]/n^{1/2}$$

Tables 1 through 8 provide trench-specific data summaries and statistical analyses. Table 9 provides overall data summaries and the overall statistical analysis. As indicated in the table, the 95% cumulative UCL concentrations were all below their respective target concentrations and/or their background range. In calculating the 95% UCL's, non-detects for analytes were treated as being present at 1/2 the detection limit. In cases where the 95% UCL exceeded the maximum detected concentration, the maximum detected concentration was used for comparison to target concentrations.

Risk Assessment

The 95% UCL concentrations of the detected analytes listed in the overall summary table (Table 9) were used to calculate hypothetical risks to future users under residential, recreational, and groundwater use scenarios. For inorganics, the 95% UCL concentrations were screened against background, with only those inorganics detected above background levels carried through the risk assessment. All detected volatile/semivolatile organics and pesticides/PCB's were included in the risk assessment, regardless of residual concentration.

Several conservative assumptions were built into the risk assessment, as follows:

- Carcinogenic and noncarcinogenic risks were calculated for both residential and recreational scenarios, although the projected future land use is recreational.

- Carcinogenic risks were calculated from exposure through ingestion of groundwater at the site, with hypothetical groundwater impacts that are greater than have historically been seen in actual groundwater monitoring performed while the wastes were still in place..

- The 95% UCL concentrations (or maximum concentrations) were selected as the representative concentrations for evaluating risks.

- Even though the site is to be covered with clean fill, the soils data was assumed to be representative of surface soils.

- It was also assumed that a future receptor would be exposed to all of the detected analytes at the 95% UCL concentrations (or maximum detected), even though the analytes were detected sporadically within different trenches across the site.

The risk assessment process followed the same methodologies and assumptions used in developing the target concentrations (see Attachment A). Soil ingestion risks were considered in the recreational and residential land use scenarios. Groundwater risks were determined by calculating the groundwater impacts due to leaching of analytes from soils, then ingestion of the groundwater at the site.

Based on the conservative assumptions and methodologies used in the risk assessment, the results present the "worst case" scenario for the site. It is probable that actual exposure concentrations and risks will be lower than presented.

Risk assessment results are summarized in Tables 11, 12, and 13. Table 11 shows risks under a recreational land use scenario, which was the assumed future land use considered in the development of the target concentrations. The hazard quotients (noncancer risks) are well below unity (i.e., 1.0) for both child and adult receptors, indicating no adverse noncancer effects are to be expected from exposure to soil through ingestion by a recreational receptor. The incremental cancer risk through soil ingestion is 5.3 x 10^{-7}, below EPA's 10^{-4} to 10^{-6} acceptable risk range.

Under the residential land use scenario (Table 12), the hazard quotients (noncancer risks) are below unity for both child and adult receptors, indicating no adverse noncancer effects are to be expected from exposure to soil through ingestion by a residential receptor. The incremental cancer risk through soil ingestion is 1.05 x 10^{-5}, which is well within EPA's 10^{-4} to 10^{-6} acceptable risk range. The majority of the cancer risk is attributable to benzo(a)pyrene and PCBs.

The groundwater usage incremental cancer risk (Table 13) is 8.5 x 10^{-6}, which is also within EPA's 10^{-4} to 10^{-6} acceptable risk range. The primary contributors to carcinogenic risk are methylene chloride, benzo(a)pyrene, and PCBs.

Summary

Based on the verification sampling data, all residual soils concentrations are below target concentrations established for the detected analytes. Similarly, both trench specific and cumulative 95% UCL concentrations are all below applicable target concentrations, verifying with a high degree of certainty that the residual soils have been adequately characterized and ensuring that the established cleanup criteria have been achieved. Both incremental noncancer and cancer risks from site soils are within or below

EPA's target risk range, under all potential future land use scenarios evaluated. Based on the sampling results, statistical evaluations, and risk assessment, Brown and Root Environmental recommends that no additional excavation or sampling be performed at this site. It is also recommended that these results be used to support a future Record of Decision (ROD), Finding of Suitability to Transfer (FOST), and/or Finding of Suitability to Lease (FOSL) for Site 4.

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

Attachments

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

TABLES

TABLE 1

TRENCH 00 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameter (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	95% UCL	Background	Exceed TC & Background
Semivolatile Organic Compounds								
Acenaphthene	2/18	0.049	0.0804	TR00-13	30	0.049		N
Anthracene	2/18	0.09	0.083	TR00-13	70	0.090		N
Benzo(a)anthracene	5/18	0.1 - 0.48	0.112	TR00-13	2	0.215		N
Benzo(a)pyrene	4/17	0.069 - 0.42	0.1082	TR00-16	1	0.206		N
Benzo(b)fluoranthene	6/18	0.022 - 0.48	0.1111	TR00-13	5	0.213		N
Benzo(g,h,i)perylene	5/18	0.034 - 0.28	0.0942	TR00-13	500	0.181		N
Benzo(k)fluoranthene	5/18	0.036 - 0.21	0.0875	TR00-13	45	0.172		N
Bis(2-Ethylhexyl)phthalat	2/4	1.2 - 2.6	0.9913	TR00-18	300	2.389		N
Chrysene	5/18	0.13 - 0.48	0.1158	TR00-13	150	0.218		N
Dibenzo(a,h)anthracene	3/18	0.069	0.0817	TR00-13	1	0.069		N
Fluoranthene	5/18	0.16 - 0.66	0.1308	TR00-13	400	0.252		N
Indeno(1,2,3-Cd)pyrene	5/18	0.029 - 0.26	0.0932	TR00-13	6	0.179		N
Phenanthrene	6/18	0.02 - 0.4	0.1002	TR00-13	80	0.195		N
Pyrene	5/18	0.13 - 0.61	0.1283	TR00-13	300	0.245		N
Pesticides/PCBs								
Aroclor-1248	1/18	0.14	0.0181	TR00-01	1.6	0.041		N
Methoxychlor	1/4	0.0027	0.0157	TR00-18	160	0.0027		N
Inorganics								
Aluminum (2)	4/4	8790 - 12500	10412.5	TR00-18	3400	12317.6885	18100	N
Antimony	1/4	1.2	0.4225	TR00-05	5.4	1.0587	13.6	N
Arsenic	3/4	2.1 - 6	2.7438	TR00-18	3	5.3991	12.1	N
Barium	4/4	41.8 - 85.9	63.35	TR00-04	1700	84.5424	225	N
Beryllium	4/4	0.6 - 0.97	0.7725	TR00-18	1	0.9669	1.7	N
Calcium	4/4	576 - 2050	1256.5	TR00-18	NA	1994.0779	1910	N
Chromium	4/4	9.1 - 21.9	14.375	TR00-18	10	20.7508	35.3	N
Cobalt	4/4	6.2 - 29.1	13.25	TR00-05	202	25.8806	21.1	N
Copper	4/4	5.9 - 56.5	23.775	TR00-14	100	50.1694	30.6	N
Iron	4/4	7890 - 23000	15222.5	TR00-18	1010	22609.6358	39900	N

TABLE 1

TRENCH 00 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameter (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	95% UCL	Background	Exceed TC & Background
Lead	4/4	3.9 - 12	7.575	TR00-18	1.4	11.5559	96.5	N
Magnesium	4/4	1360 - 4160	2292.5	TR00-18	NA	3822.7756	4960	N
Manganese	4/4	261 - 1340	653.75	TR00-05	77	1209.6263	2010	N
Nickel	4/4	8.5 - 15.9	10.55	TR00-18	130	14.7564	19.1	N
Potassium	4/4	394 - 2250	921.25	TR00-18	NA	1965.8722	3050	N
Selenium	4/4	1.1 - 1.9	1.5	TR00-18	5.2	1.9		N
Sodium	2/4	139 - 165	131.875	TR00-05	NA	165	86.7	N
Thallium	11/16	0.77 - 2.1	1.0102	TR00-01	2.9	1.3267	0.42	N
Vanadium	4/4	11.5 - 30.4	22.4	TR00-18	5200	30.4	45	N
Zinc	4/4	14.3 - 35.5	23.25	TR00-18	1000	33.7626	60	N

1 Data is included from the following samples: W-TR00-08, W-TR00-01, W-TR00-02, W-TR00-03, W-TR00-04, W-TR00-05, W-TR00-06, W-TR00-07
W-TR00-09, W-TR00-10, W-TR00-11, W-TR00-14, W-TR00-15, W-TR00-16, W-TR00-17, W-TR00-18
W-TR00-18R
2 The Aluminum result for W-TR00-18 has been replaced with the value of Aluminum in the W-TR00-18R sample.

TABLE 2

TRENCH 01 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameter (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	95% UCL	Background	Exceed TC & Background
Volatile Organic Compounds								
Methylene chloride	1/22	0.006	0.0024	TR01-19	0.3	0.0027		N
Semivolatile Organic Compounds								
Bis(2-Ethylhexyl)phthalat	1/7	1.8	0.3986	TR01-20	300	0.9866		N
Fluoranthene	1/22	0.052	0.1599	TR01-18	400	0.0520		N
Pyrene	1/22	0.05	0.1598	TR01-18	300	0.0500		N
Pesticides/PCBs								
Aroclor-1254	1/22	0.003	0.0192	TR01-14	1.6	0.003		N
4,4'-DDT	1/7	0.0045	0.0075	TR01-16	1.6	0.0045		N
Inorganics								
Aluminum (2)	7/7	5700 - 15800	10622.86	TR01-17	3400	13729.4494	18100	N
Antimony	3/7	0.69 - 1.25	0.5743	TR01-17	5.4	0.9073	13.6	N
Arsenic	7/7	1 - 8.5	3.4786	TR01-19	3	3.3949	12.1	N
Barium	7/7	33.5 - 111	56.3571	TR01-04	1700	80.7241	225	N
Beryllium	7/7	0.6 - 0.86	0.7486	TR01-19	1	0.8017	1.7	N
Calcium	7/7	524 - 2100	1058.857	TR01-04	NA	1598.3257	1910	N
Chromium	7/7	5.2 - 29.5	15.85	TR01-19	10	19.6945	35.3	N
Cobalt	7/7	6.8 - 11.3	8.7786	TR01-04	202	9.9782	21.1	N
Copper	7/7	15 - 134	59.0643	TR01-04	100	101.8635	30.6	N
Iron	7/7	8530 - 27700	16481.43	TR01-19	1010	18783.3767	39900	N
Lead	7/7	2 - 13.6	6.8714	TR01-16	1.4	9.8718	96.5	N
Magnesium	7/7	1550 - 3590	2351.429	TR01-19	NA	2414.2747	4960	N
Manganese	7/7	254 - 641	408.3571	TR01-22	77	550.3311	2010	N
Nickel	7/7	7.9 - 17.4	12.6214	TR01-04	130	14.7162	19.1	N
Potassium	7/7	164 - 1980	787.1429	TR01-19	NA	945.7956	3050	N
Selenium	7/7	1 - 2.4	1.5429	TR01-17	5.2	1.9261		N
Sodium	4/7	165 - 198	220.5	TR01-17	NA	198.0000	86.7	N
Thallium	18/22	0.96 - 2.65	1.1925	TR01-17	2.9	1.3812	0.42	N
Vanadium	7/7	10.8 - 45.5	25.9571	TR01-19	5200	30.9120	45	N
Zinc	7/7	17.8 - 44.3	28.7929	TR01-16	1000	35.7725	60	N

1 Data is included from the following samples: W-TR01-08, W-TR01-01, W-TR01-02, W-TR01-03, W-TR01-04, W-TR01-05, W-TR01-06, W-TR01-07 W-TR01-09, W-TR01-10, W-TR01-11, W-TR01-12, W-TR01-13, W-TR01-14, W-TR01-15, W-TR01-16 W-TR01-23, W-TR01-18, W-TR01-19, W-TR01-19R, W-TR01-20, W-TR01-21, W-TR01-22

2 The Aluminum result for W-TR01-19 has been replaced with the value of Aluminum in the W-TR01-19R sample.

TABLE 3

TRENCH 02 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameter (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	95% UCL	Background	Exceed TC & Background
Volatile Organic Compounds								
Methylene chloride	2/20	0.004	0.0027	TR02-00/TR02-04	0.3	0.0028		N
Semivolatile Organic Compounds								
Benzo(a)anthracene	1/20	0.046	0.1591	TR02-01	1.5	0.046		N
Benzo(a)pyrene	1/20	0.046	0.1591	TR02-01	0.6	0.046		N
Benzo(b)fluoranthene	1/20	0.056	0.1596	TR02-01	4.5	0.056		N
Benzo(g,h,i)perylene	1/20	0.016	0.1576	TR02-01	500	0.016		N
Benzo(k)fluoranthene	1/20	0.029	0.1582	TR02-01	45	0.029		N
Bis(2-Ethylhexyl)phthalat	1/4	0.036	0.1328	TR02-09	300	0.036		N
Chrysene	1/20	0.049	0.1592	TR02-01	150	0.049		N
Fluoranthene	1/20	0.071	0.1603	TR02-01	400	0.071		N
Indeno(1,2,3-Cd)pyrene	1/20	0.017	0.1576	TR02-01	6	0.017		N
Phenanthrene	1/20	0.031	0.1583	TR02-01	80	0.031		N
Pyrene	1/20	0.073	0.1604	TR02-01	300	0.073		N
Inorganics								
Aluminum	4/4	7300 - 12700	9480	TR02-19	3400	12420.2145	18100	N
Arsenic	4/4	3.2 - 7.9	5.1	TR02-09	3	7.4628	12.1	N
Barium	4/4	27.7 - 75.2	56.05	TR02-09	1700	75.2	225	N
Beryllium	4/4	0.62 - 1.1	0.8375	TR02-09	1	1.0873	1.7	N
Calcium	4/4	424 - 1500	1151	TR02-08/TR02-09	NA	1500	1910	N
Chromium	4/4	11.6 - 24.4	17.425	TR02-09	10	24.0207	35.3	N
Cobalt	4/4	5.8 - 10.3	7.7	TR02-19	202	9.9136	21.1	N
Copper	4/4	18 - 59.5	36.275	TR02-18	100	59.5	30.6	N
Iron	4/4	11700 - 24400	15800	TR02-09	1010	22727.7105	39900	N
Lead	4/4	3 - 7.7	5.05	TR02-09	1.4	7.4544	96.5	N
Magnesium	4/4	1420 - 3420	2302.5	TR02-19	NA	3420	4960	N
Manganese	4/4	218 - 626	441	TR02-08	77	626	2010	N
Nickel	4/4	7.4 - 15.4	10.5	TR02-19	130	14.8153	19.1	N
Potassium	4/4	345 - 877	597	TR02-09	NA	867.1154	3050	N
Selenium	3/4	1.8 - 2.3	1.6375	TR02-08	5.2	2.3		N
Thallium	19/20	0.61 - 2.6	1.5665	TR02-10	2.9	1.8208	0.42	N
Vanadium	4/4	18.3 - 44.6	28.7	TR02-09	5200	42.049	45	N
Zinc	4/4	15.1 - 38.3	24.75	TR02-09	1000	36.397	60	N

1 Data is included from the following samples: W-TR02-06, W-TR02-01, W-TR02-02, W-TR02-03, W-TR02-04, W-TR02-05, W-TR02-07, W-TR02-08
W-TR02-09, W-TR02-10, W-TR02-11, W-TR02-12, W-TR02-13, W-TR02-14, W-TR02-15, W-TR02-16
W-TR02-21, W-TR02-18, W-TR02-19, W-TR02-20

TABLE 4

TRENCH 03 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameter (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	95% UCL	Background	Exceed TC & Background
Semivolatile Organic Compounds								
Benzo(a)anthracene	1/19	0.065	0.1597	TR03-06	1.5	0.065		N
Benzo(b)fluoranthene	2/19	0.06 - 0.084	0.1552	TR03-06	4.5	0.084		N
Benzo(g,h,i)perylene	1/19	0.025	0.1576	TR03-06	500	0.025		N
Chrysene	1/19	0.064	0.1597	TR03-06	150	0.064		N
Fluoranthene	2/19	0.1	0.1582	TR03-06/09	400	0.1		N
Phenanthrene	2/19	0.026 - 0.052	0.1517	TR03-06	80	0.052		N
Pyrene	2/19	0.12 - 0.13	0.1608	TR03-06	300	0.13		N
Pesticide/PCBs								
Aroclor-1248	1/23	0.036	0.0208	TR03-06	1.6	0.022		N
Inorganics								
Aluminum	5/5	7200 - 8820	7666	TR03-09	3400	8296.4234	18100	N
Arsenic	5/5	1.3 - 3.1	2.54	TR03-09	3	3.1	12.1	N
Barium	5/5	54.4 - 102	81.42	TR03-09	1700	101.8283	225	N
Beryllium	5/5	0.65 - 1.3	1.038	TR03-05/15	1	1.3	1.7	N
Calcium	5/5	849 - 1900	1277.8	TR03-05	NA	1642.969	1910	N
Chromium	5/5	12.8 - 17.2	15.28	TR03-15	10	17.2	35.3	N
Cobalt	5/5	5.9 - 11.7	7.68	TR03-05	202	10.0981	21.1	N
Copper	5/5	10 - 27.5	15.72	TR03-05	100	22.6177	30.6	N
Iron	5/5	14900 - 18500	17000	TR03-15	1010	18248.6314	39900	N
Lead	5/5	7.5 - 10.4	8.64	TR03-08	1.4	10.0455	96.5	N
Magnesium	5/5	1760 - 3180	2456	TR03-05	NA	2935.61	4960	N
Manganese	5/5	167 - 707	321	TR03-05	77	530.1741	2010	N
Nickel	5/5	8 - 13.3	11.08	TR03-05	130	12.9742	19.1	N
Potassium	5/5	479 - 1420	718.8	TR03-05	NA	1094.6314	3050	N
Selenium	5/5	0.79 - 1.3	0.996	TR03-05	5.2	1.1917		N
Thallium	4/19	0.84 - 2.4	0.6813	TR03-02	2.9	0.8947	0.42	N
Vanadium	5/5	16 - 31.6	25.4	TR03-15	5200	31.3547	45	N
Zinc	5/5	31.5 - 59.9	42.66	TR03-08	1000	53.241	60	N

1 Data is included from the following samples: W-TR03-01, W-TR03-02, W-TR03-03, W-TR03-05, W-TR03-06, W-TR03-07, W-TR03-08, W-TR03-09 W-TR03-10, W-TR03-11, W-TR03-24, W-TR03-23, W-TR03-15, W-TR03-16, W-TR03-17, W-TR03-19 W-TR03-20, W-TR03-21, W-TR03-22

TABLE 5

TRENCH 04 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameters (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	96% UCL	Background	Exceed TC & Background
Volatile Organic Compounds								
Acetone	2/7	0.008	0.0059	TR04-09/19	0.03	0.0072744		N
Ethylbenzene	1/7	0.003	0.0026	TR04-08	64	0.0027513		N
Toluene	1/7	0.14	0.0216	TR04-08	92	0.0711991		N
Xylenes, total	1/7	0.023	0.0097	TR04-08	920	0.0152888		N
Semivolatile Organic Compounds								
Benzo(a)anthracene	1/14	0.17	0.1654	TR04-03	1.5	0.16607		N
Benzo(a)pyrene	1/14	0.18	0.1661	TR04-03	0.6	0.16821		N
Benzo(b)fluoranthene	3/14	0.025 - 0.21	0.1503	TR04-03	4.5	0.1741449		N
Benzo(g,h,i)perylene	1/14	0.11	0.1611	TR04-03	500	0.11		N
Benzo(k)fluoranthene	3/14	0.012 - 0.086	0.1386	TR04-03	45	0.086		N
Bis(2-Ethylhexyl)phthalat	4/7	0.18 - 0.51	0.2636	TR04-09	300	0.4092222		N
Chrysene	1/14	0.2	0.1675	TR04-03	150	0.17249		N
Fluoranthene	2/14	0.056 - 0.29	0.1661	TR04-03	400	0.1898847		N
Indeno(1,2,3-Cd)pyrene	1/14	0.12	0.1618	TR04-03	6	0.12		N
Phenanthrene	1/14	0.093	0.1599	TR04-03	80	0.093		N
Pyrene	2/14	0.14 - 0.33	0.175	TR04-03	300	0.1989257		N
Pesticide/PCBs								
Aroclor-1242	2/14	0.012 - 0.1	0.0251	TR04-14	1.6	0.0366499		N
Methoxychlor	1/7	0.0026	0.0347	TR04-03	160	0.0026		N
Inorganics								
Aluminum (2)	7/7	5890 - 11000	9407.1429	TR04-03	3400	10918.036	18100	N
Arsenic	7/7	2.2 - 9.1	5.8714	TR04-09	3	7.2051	12.1	N
Barium	7/7	42.8 - 103	64.6357	TR04-13	1700	87.1851	225	N
Beryllium	5/7	0.64 - 1.3	0.7293	TR04-13	1	1.0964	1.7	N
Calcium	7/7	438 - 34400	5688	TR04-03	NA	17778.3458	1910	N
Chromium	7/7	15.7 - 26.55	18.6071	TR04-00	10	18.5161	35.3	N
Cobalt	7/7	1.8 - 13.3	7.1286	TR04-05	202	11.4804	21.1	N
Copper	7/7	5.1 - 23.4	11.6429	TR04-13	100	17.2595	30.6	N

TABLE 5

TRENCH 04 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameters (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	96% UCL	Background	Exceed TC & Background
Iron	7/7	8170 - 24200	17138.5714	TR04-00	1010	19303.1678	39900	N
Lead	7/7	5.9 - 14	8.25	TR04-08	1.4	10.5765	96.5	N
Magnesium	7/7	1280 - 21900	5042.1429	TR04-03	NA	12124.5269	4960	N
Manganese	7/7	23.8 - 504	291.1786	TR04-05	77	504	2010	N
Nickel	7/7	5.8 - 20.9	11.6143	TR04-13	130	15.9425	19.1	N
Potassium	6/7	427 - 1820	843.9286	TR04-03	NA	1289.7904	3050	N
Selenium	2/7	1.3 - 2.05	0.7036	TR04-00	5.2	0.8206		N
Sodium	1/7	1620	322.2857	TR04-03	NA	862.1994	86.7	N
Vanadium	7/7	13.2 - 54.2	32.3714	TR04-09	5200	42.4117	45	N
Zinc	7/7	15.9 - 34.6	27.9286	TR04-00/08	1000	33.1208	60	N

1 Data is included from the following samples: W-TR04-00-AVG, W-TR04-00R, W-TR04-02, W-TR04-03, W-TR04-05, W-TR04-06, W-TR04-07, W-TR04-0
W-TR04-09, W-TR04-10, W-TR04-11, W-TR04-13, W-TR04-14, W-TR04-15, W-TR04-19

2 The Aluminum result for W-TR04-01 has been replaced with the value of Aluminum in the W-TR04-00R sample.

TABLE 6

TRENCH 05 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameter (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	95% UCL	Background	Exceed TC & Background
Volatile Organic Compounds								
Trichlorofluoromethane	1/10	0.0002	0.0023	TR05-08	120	0.0002		N (2)
Pesticide/PCBs								
Aroclor-1242	1/12	0.047	0.0223	TR05-02	1.6	0.026291		N
Inorganics								
Aluminum	2/2	9560 - 10200	9880	TR05-06	3400	10200	18100	N
Antimony	1/2	0.91	0.63	TR05-06	5.4	0.91	13.6	N
Arsenic	2/2	0.49 - 1.8	1.145	TR05-07	3	1.8	12.1	N
Barium	2/2	76.7 - 200	138.35	TR05-06	1700	200	225	N
Beryllium	2/2	0.86 - 1.7	1.28	TR05-06	1	1.7	1.7	N
Calcium	2/2	1130 - 3270	2200	TR05-06	NA	3270	1910	N
Chromium	2/2	20.6 - 35.2	27.9	TR05-07	10	35.2	35.3	N
Cobalt	2/2	2.8 - 15.5	9.15	TR05-06	202	15.5	21.1	N
Copper	2/2	3.9 - 6.8	5.35	TR05-07	100	6.8	30.6	N
Iron	2/2	12600 - 24000	18300	TR05-06	1010	24000	39900	N
Lead	2/2	7.8 - 19.9	13.85	TR05-06	1.4	19.9	96.5	N
Magnesium	2/2	1560 - 4300	2930	TR05-06	NA	4300	4960	N
Manganese	2/2	126 - 1030	578	TR05-06	77	1030	2010	N
Nickel	2/2	8.5 - 24.3	16.4	TR05-06	130	24.3	19.1	N
Potassium	2/2	701 - 2400	1550.5	TR05-06	NA	2400	3050	N
Selenium	2/2	0.72 - 2	1.36	TR05-06	5.2	2		N
Sodium	2/2	196 - 214	205	TR05-06	NA	214	86.7	N
Thallium	10/12	0.79 - 2.7	1.2833	TR05-08	2.9	1.6686	0.42	N
Vanadium	2/2	23.6 - 25	24.3	TR05-07	5200	25	45	N
Zinc	2/2	23.1 - 48.7	35.9	TR05-06	1000	48.7	60	N

1 Data is included from the following samples: W-TR05-01, W-TR05-02, W-TR05-03, W-TR05-04, W-TR05-05, W-TR05-06, W-TR05-07, W-TR05-14, W-TR05-09, W-TR05-10, W-TR05-11, and W-TR05-12.

2 The concentration of Trichlorofluoromethane is several orders of magnitude below the EPA's Region II risk-based concentration of 23,000 mg/kg, thu no risk is posed by this compound.

TABLE 7

TRENCH 06 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameter (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	95% UCL	Background	Exceed TC & Background
Inorganics								
Aluminum	2/2	10500 - 14200	12350	TR06-13	3400	14200	18100	N
Arsenic	2/2	4.7 - 6	5.35	TR06-13	3	6	12.1	N
Barium	2/2	73.8 - 92.7	83.25	TR06-07	1700	92.7	225	N
Beryllium	2/2	0.87 - 1.6	1.235	TR06-07	1	1.6	1.7	N
Calcium	2/2	1330 - 2570	1950	TR06-07	NA	2570	1910	N
Chromium	2/2	21.5 - 23.8	22.65	TR06-07	10	23.8	35.3	N
Cobalt	2/2	8.8 - 9.1	8.95	TR06-13	202	9.1	21.1	N
Copper	2/2	4 - 12.4	8.2	TR06-13	100	12.4	30.6	N
Iron	2/2	19100 - 35900	27500	TR06-07	1010	35900	39900	N
Lead	2/2	7.6 - 12.6	10.1	TR06-07	1.4	12.6	96.5	N
Magnesium	2/2	2960 - 3080	3020	TR06-13	NA	3080	4960	N
Manganese	2/2	183 - 390	286.5	TR06-13	77	390	2010	N
Nickel	2/2	11.6 - 13.6	12.6	TR06-13	130	13.6	19.1	N
Potassium	2/2	1250 - 1470	1360	TR06-07	NA	1470	3050	N
Selenium	2/2	1.3 - 2.5	1.9	TR06-07	5.2	2.5		N
Sodium	2/2	340 - 367	353.5	TR06-07	NA	367	86.7	N
Thallium	12/13	0.57 - 2.3	1.1358	TR06-11	2.9	1.4224	0.42	N
Vanadium	2/2	23.4 - 37.6	30.5	TR06-13	5200	37.6	45	N
Zinc	2/2	34.4 - 42.1	38.25	TR06-13	1000	42.1	60	N

1 Data is included from the following samples: W-TR06-09, W-TR06-01, W-TR06-02, W-TR06-03, W-TR06-04, W-TR06-05, W-TR06-06, W-TR06-07, W-TR06-08, W-TR06-10, W-TR06-11, W-TR06-12, W-TR06-13, and W-TR06-14.

TABLE 8

TRENCH 07 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameter (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	95% UCL	Background	Exceed TC & Background
Volatile Organic Compounds								
Chlorobenzene	1/10	0.001	0.0024	TR07-01	3.6	0.001		N
Methylene chloride	8/10	0.003 - 0.004	0.0032	TR07-04/07/09	0.3	0.0035912		N
Semivolatile Organic Compounds								
Benzo(a)anthracene	1/10	0.21	0.1695	TR07-02	1.5	0.1777485		N
Benzo(a)pyrene	1/10	0.17	0.1655	TR07-02	0.6	0.1664165		N
Benzo(b)fluoranthene	1/10	0.19	0.1675	TR07-02	4.5	0.1720825		N
Benzo(k)fluoranthene	1/10	0.1	0.1585	TR07-02	45	0.1		N
Chrysene	1/10	0.22	0.1705	TR07-02	150	0.1805815		N
Fluoranthene	1/10	0.41	0.1895	TR07-02	400	0.2344085		N
Phenanthrene	1/10	0.26	0.1745	TR07-02	80	0.1919135		N
Pyrene	1/10	0.54	0.2025	TR07-02	300	0.2712375		N
Pesticide/PCBs								
Aroclor-1242	4/10	0.014 - 0.15	0.0424	TR07-04	1.6	0.0682406		N
Inorganics								
Aluminum	1/1	11900	11900	TR07-07	3400	11900	18100	N
Antimony	1/1	0.58	0.58	TR07-07	5.4	0.58	13.6	N
Arsenic	1/1	2.6	2.6	TR07-07	3	2.6	12.1	N
Barium	1/1	105	105	TR07-07	1700	105	225	N
Beryllium	1/1	1.5	1.5	TR07-07	1	1.5	1.7	N
Calcium	1/1	1580	1580	TR07-07	NA	1580	1910	N
Chromium	1/1	26.2	26.2	TR07-07	10	26.2	35.3	N
Cobalt	1/1	15.6	15.6	TR07-07	202	15.6	21.1	N
Copper	1/1	8.6	8.6	TR07-07	100	8.6	30.6	N
Iron	1/1	27700	27700	TR07-07	1010	27700	39900	N
Lead	1/1	13.9	13.9	TR07-07	1.4	13.9	96.5	N
Magnesium	1/1	2930	2930	TR07-07	NA	2930	4960	N
Manganese	1/1	999	999	TR07-07	77	999	2010	N
Nickel	1/1	15	15	TR07-07	130	15	19.1	N
Potassium	1/1	1800	1800	TR07-07	NA	1800	3050	N
Selenium	1/1	1.8	1.8	TR07-07	5.2	1.8		N
Thallium	9/10	1.1 - 2.2	1.465	TR07-07	2.9	0.0017278	0.42	N
Vanadium	1/1	33.2	33.2	TR07-07	5200	33.2	45	N
Zinc	1/1	35.3	35.3	TR07-07	1000	35.3	60	N

1 Data is included from the following samples: W-TR07-01, W-TR07-02, W-TR07-03, W-TR07-04, W-TR07-11, W-TR07-06, W-TR07-07, W-TR07-08, W-TR07-09, W-TR07-10, W-TR07-12, and W-TR07-13.

TABLE 9

TRENCHES 00-07 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameter (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	95% UCL	Background	Exceed TC & Background
Volatile Organic Compounds								
Acetone	2/32	0.008	0.0052	TR04-09/TR04-19	0.03	0.008		N
Chlorobenzene	1/126	0.001	0.0025	TR07-01	3.6	0.001		N
Ethylbenzene	1/32	0.003	0.0025	TR04-08	64	0.003		N
Methylene chloride	11/126	0.003 - 0.006	0.0023	TR01-19	0.3	0.006		N
Toluene	1/32	0.14	0.0067	TR04-08	92	0.14		N
Trichlorofluoromethane	1/94	0.0002	0.0025	TR05-08	120	0.0002		N
Xylenes, total	1/32	0.023	0.008	TR04-08	920	0.023		N
Semivolatile Organic Compounds								
Acenaphthene	1/126	0.049	0.1641	TR00-16	30	0.049		N
Anthracene	1/126	0.09	0.1644	TR00-16	70	0.09		N
Benzo(a)anthracene	7/126	0.046 - 0.48	0.1654	TR00-16	1.5	0.48		N
Benzo(a)pyrene	6/126	0.046 - 0.42	0.1655	TR00-16	0.6	0.42		N
Benzo(b)fluoranthene	11/126	0.022 - 0.48	0.1622	TR00-16	4.5	0.48		N
Benzo(g,h,i)perylene	6/126	0.016 - 0.28	0.1618	TR00-16	500	0.28		N
Benzo(k)fluoranthene	8/126	0.012 - 0.21	0.1591	TR00-16	45	0.21		N
Bis(2-Ethylhexyl)phthalat	8/32	0.036 - 2.6	0.3421	TR00-18	300	2.6		N
Chrysene	7/126	0.049 - 0.48	0.1663	TR00-16	150	0.48		N
Dibenzo(a,h)anthracene	1/126	0.069	0.1642	TR00-16	0.6	0.069		N
Fluoranthene	10/126	0.052 - 0.66	0.1686	TR00-16	400	0.66		N
Indeno(1,2,3-Cd)pyrene	5/126	0.017 - 0.26	0.1629	TR00-16	6	0.26		N
Phenanthrene	9/126	0.02 - 0.4	0.1617	TR00-16	80	0.4		N
Pyrene	10/126	0.05 - 0.61	0.1707	TR00-16	300	0.61		N
Pesticide/PCBs								
4,4'-DDT	1/32	0.0045	0.0079	TR01-16	1.6	0.0045		N
Methoxychlor	2/32	0.0026 - 0.0027	0.0377	TR00-18	160	0.0027		N
Aroclor-1242	7/126	0.012 - 0.15	0.0226	TR07-04	1.6	0.15		N
Aroclor-1248	2/126	0.036 - 0.14	0.0211	TR00-01	1.6	0.14		N
Aroclor-1254	1/126	0.003	0.0199	TR01-14	1.6	0.003		N
Inorganics								
Aluminum	32/32	5700 - 15800	9827.1875	TR01-17	3400	10512.886	18100	N
Antimony	6/32	0.58 - 1.25	0.4508	TR01-17	5.4	1.25	13.6	N
Arsenic	31/32	0.49 - 9.1	3.9278	TR04-09	3	9.1	12.1	N
Barium	32/32	27.7 - 200	71.2453	TR05-06	1700	87.3166	225	N
Beryllium	30/32	0.6 - 1.7	0.8908	TR05-06	1	1.7	1.7	N
Calcium	32/32	424 - 34400	2285.2188	TR04-03	NA	34400	1910	N

TABLE 9

TRENCHES 00-07 VERIFICATION SAMPLING RESULTS SUMMARY
SITE 4 REMOVAL ACTION
NAWC, WARMINSTER, PENNSYLVANIA

Parameter (mg/kg)	Frequency of Detection (1)	Range of Detection	Average	Location of Maximum	Target Concentration (TC)	95% UCL	Background	Exceed TC & Background
Chromium	32/32	5.2 - 35.2	17.8781	TR05-07	10	19.3736	35.3	N
Cobalt	32/32	1.8 - 29.1	8.9172	TR00-05	202	29.1	21.1	N
Copper	32/32	3.9 - 134	26.5453	TR01-04	100	35.63	30.6	N
Iron	32/32	7890 - 35900	17616.5625	TR06-07	1010	19525.487	39900	N
Lead	32/32	2 - 19.9	8.1672	TR05-06	1.4	9.8443	96.5	N
Magnesium	32/32	1280 - 21900	3038.9063	TR04-03	NA	21900	4960	N
Manganese	32/32	23.8 - 1340	425.2734	TR00-05	77	1340	2010	N
Nickel	32/32	5.8 - 24.3	11.9453	TR05-06	130	13.3615	19.1	N
Potassium	31/32	164 - 2400	897.0469	TR05-06	NA	1280.7319	3050	N
Selenium	26/32	0.72 - 2.5	1.2992	TR06-07	5.2	1.4885		N
Sodium	11/32	139 - 1620	206.2688	TR04-03	NA	242.936	86.7	N
Thallium	83/126	0.57 - 2.7	1.111	TR05-08	2.9	2.7	0.42	N
Vanadium	32/32	10.8 - 54.2	27.5781	TR04-09	5200	29.7818	45	N
Zinc	32/32	14.3 - 59.9	30.8109	TR03-08	1000	35.3736	60	N

Data is included from the following samples:W-TR00-08, W-TR00-01, W-TR00-02, W-TR00-03, W-TR00-04, W-TR00-05, W-TR00-06, W-TR00-07
W-TR00-09, W-TR00-10, W-TR00-11, W-TR00-14, W-TR00-15, W-TR00-16, W-TR00-17, W-TR00-18
W-TR00-18R, W-TR01-08, W-TR01-01, W-TR01-02, W-TR01-03, W-TR01-04, W-TR01-05, W-TR01-06
W-TR01-07, W-TR01-09, W-TR01-10, W-TR01-11, W-TR01-12, W-TR01-13, W-TR01-14, W-TR01-15
W-TR01-16, W-TR01-23, W-TR01-18, W-TR01-19, W-TR01-19R, W-TR01-20, W-TR01-21, W-TR01-22
W-TR02-06, W-TR02-01, W-TR02-02, W-TR02-03, W-TR02-04, W-TR02-05, W-TR02-07, W-TR02-08
W-TR02-09, W-TR02-10, W-TR02-11, W-TR02-12, W-TR02-13, W-TR02-14, W-TR02-15, W-TR02-16
W-TR02-21, W-TR02-18, W-TR02-19, W-TR02-20, W-TR03-01, W-TR03-02, W-TR03-03, W-TR03-05
W-TR03-06, W-TR03-07, W-TR03-08, W-TR03-09, W-TR03-10, W-TR03-11, W-TR03-24, W-TR03-23
W-TR03-15, W-TR03-16, W-TR03-17, W-TR03-19, W-TR03-20, W-TR03-21, W-TR03-22, W-TR04-00-AVG
W-TR04-00R, W-TR04-02, W-TR04-03, W-TR04-05, W-TR04-06, W-TR04-07, W-TR04-08, W-TR04-09
W-TR04-10, W-TR04-11, W-TR04-13, W-TR04-14, W-TR04-15, W-TR04-19, W-TR05-01, W-TR05-02
W-TR05-03, W-TR05-04, W-TR05-05, W-TR05-06, W-TR05-07, W-TR05-14, W-TR05-09, W-TR05-10
W-TR05-11, W-TR05-12, W-TR06-09, W-TR06-01, W-TR06-02, W-TR06-03, W-TR06-04, W-TR06-05
W-TR06-07, W-TR06-08, W-TR06-10, W-TR06-11, W-TR06-12, W-TR06-13, W-TR06-14, W-TR07-01
W-TR07-02, W-TR07-03, W-TR07-04, W-TR07-11, W-TR07-07, W-TR07-08, W-TR07-09, W-TR07-10
W-TR07-13

TABLE 10

TARGET CLEAN-UP CONCENTRATIONS SUMMARY
SITE 4 REMOVAL ACTION
NAWC WARMINSTER, PENNSYLVANIA

	PADEP (1) (mg/kg)	Risk-Based (2)(4) (mg/kg)	Groundwater Protection (3)(4) (mg/kg)	Minimum (4) (mg/kg)
Semivolatile Organics				
2-Methylnaphthalene	NA	NA	140	140
Acenaphthene	30	76000	630	30
Acenaphthylene	NA	NA	160	160
Anthracene	70	380000	13000	70
Benzo(a)anthracene	6	17	1.5	1.5
Benzo(a)pyrene	0.6	1.7	82	0.6
Benzo(b)fluoranthene	6	17	4.5	4.5
Benzo(ghi)perylene	500	NA	96000	500
Benzo(k)fluoranthene	NA	170	45	45
Bis(2-ethylhexyl)phthalate	300	900	3600	300
Chrysene	500	1700	150	150
Dibenzo(a,h)anthracene	0.6	1.7	1.4	0.6
Fluoranthene	400	50400	6400	400
Fluorene	40	50400	830	40
Indeno(1,2,3,-cd)pyrene	6	17	13	6
Naphthalene	8	50400	140	8
Phenanthrene	80	NA	850	80
Pyrene	300	38000	4600	300
Volatile Organics				
2-Butanone	0.05	760000	170	0.05
Acetone	0.03	130000	340	0.03
Benzene	0.8	430	0.46	0.46
Bromomethane	1	1800	0.8	0.8
Carbon tetrachloride	0.5	97	0.46	0.46
Chlorobenzene	10	25000	3.6	3.6
cis-1,2-Dichloroethene	7	13000	6.4	6.4
Ethylbenzene	7000	130000	64	64
Methylene chloride	0.3	1700	0.46	0.3

TABLE 10

TARGET CLEAN-UP CONCENTRATIONS SUMMARY
SITE 4 REMOVAL ACTION
NAWC WARMINSTER, PENNSYLVANIA

	PADEP (1) (mg/kg)	Risk-Based (2)(4) (mg/kg)	Groundwater Protection (3)(4) (mg/kg)	Minimum (4) (mg/kg)
Styrene	10000	250000	9.2	9.2
Tetrachloroethene	700	240	0.46	0.46
Toluene	16000	250000	92	92
Trichloroethene	2	1100	0.46	0.46
Trichlorofluoromethane	NA	380000	120	120
Vinyl chloride	2	6.6	0.18	0.18
Xylenes, total	100000	2500000	920	920
Pesticides/PCBs				
4,4'-DDT	10	37	21	10
Aroclor-1242	5	1.6	5.5	1.6
Aroclor-1248	5	1.6	5.5	1.6
Aroclor-1254	5	1.6	5.5	1.6
Methoxychlor	300	6300	160	160
Inorganics				
Aluminum	NA	1300000	3400	3400
Antimony	30	504	5.4	5.4
Arsenic	3	8.4	29	3
Barium	5000	88000	1700	1700
Beryllium	1	2.9	63	1
Cadmium	20	630	7.5	7.5
Calcium	NA	NA	NA	NA
Chromium	10	6300	38	10
Cobalt	NA	76000	202	202
Copper	100	50400	120	100
Iron	NA	380000	1010	1010
Lead	200	NA	1.4	1.4
Magnesium	NA	NA	NA	NA
Manganese	400	29000	77	77
Mercury	20	380	2.1	2.1

TABLE 10

TARGET CLEAN-UP CONCENTRATIONS SUMMARY
SITE 4 REMOVAL ACTION
NAWC WARMINSTER, PENNSYLVANIA

	PADEP (1) (mg/kg)	Risk-Based (2)(4) (mg/kg)	Groundwater Protection (3)(4) (mg/kg)	Minimum (4) (mg/kg)
Nickel	200	25000	130	130
Potassium	NA	NA	NA	NA
Selenium	50	6300	5.2	5.2
Silver	400	6300	31	31
Sodium	NA	NA	NA	NA
Thallium	6	101	2.9	2.9
Vanadium	NA	8800	5200	5200
Zinc	1000	380000	14000000	1000

FOOTNOTES:

1 Values presented are from the "Technical Manual , Pennsylvania's Land Recycling, Revison 1 to Appendix B2 (Statewide Human Health Standards for Soils)," 4/26/96.

2 USEPA Region III Risk-Based Concentration Table, January-June 1996.

3 Three references: "Soil Screening Guidance: User's Guide", April 1996, "Aquatic Fate Process Data for Organic Priority Pollutants" , USEPA, 1982 and the " Drinking Water Regulations and Health Advisories", October 1996 were used to obtain groundwater protection values.

4 Values were presented to two significant figures.

TABLE 11

RECREATIONAL RISK ESTIMATES - SOIL INGESTION
SITE 4 REMOVAL ACTION
NAWC WARMINSTER, PENNSYLVANIA

Chemical of Potential Concern	Soil Conc. (mg/kg)	leanup Leve Goal (mg/kg)	Reference Dose (mg/kg/day)	Slope Factor kg-day/mg	Hazard Quotient (Child Soil Ingestion	Cancer Risk Soil Ingestion	Hazard Quotient (Adult) Soil Ingestion
Volatile Organics							
Acetone	0.008	0.03	1.00E-01	NA	6.34E-08	NA	1.16E-08
Chlorobenzene	0.001	3.6	2.00E-02	NA	3.96E-08	NA	7.27E-09
Ethylbenzene	0.003	64	1.00E-01	NA	2.38E-08	NA	4.36E-09
Methylene chloride	0.006	0.3	6.00E-02	7.50E-03	7.92E-08	3.58E-12	1.45E-08
Toluene	0.14	92	2.00E-01	NA	5.55E-07	NA	1.02E-07
Trichloroflurometh ane	0.0002	120	3.00E-01	NA	5.28E-10	NA	9.70E-11
Xylenes, total	0.023	920	2.00E+00	NA	9.11E-09	NA	1.67E-09
Semivolatile Organics							
Acenaphthene	0.049	30	6.00E-02	NA	6.47E-07	NA	1.19E-07
Anthracene	0.09	70	3.00E-01	NA	2.38E-07	NA	4.36E-08
Benzo(a)anthracene	0.48	1.5	NA	7.30E-01	NA	2.78E-08	NA
Benzo(a)pyrene	0.42	0.6	NA	7.30E+00	NA	2.44E-07	NA
Benzo(b)fluoranthene	0.48	4.5	NA	7.30E-01	NA	2.78E-08	NA
Benzo(g,h,i)perylene	0.28	500	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.21	45	NA	7.30E-02	NA	1.22E-09	NA
Bis(2-ethylhexyl)phthal	2.6	300	2.00E-02	NA	1.03E-04	NA	1.89E-05
Chrysene	0.48	150	NA	7.30E-03	NA	2.78E-10	NA
Dibenzo(a,h)anthracen	0.069	0.6	NA	7.30E+00	NA	4.00E-08	NA
Fluoranthene	0.66	400	4.00E-02	NA	1.31E-05	NA	2.40E-06
Indeno(1,2,3-cd)pyrene	0.26	6	NA	7.30E-01	NA	1.51E-08	NA
Phenanthrene	0.4	80	NA	NA	NA	NA	NA
Pyrene	0.61	300	3.00E-02	NA	1.61E-05	NA	2.96E-06
Pesticides/PCBs							
4,4'-DDT	0.0045	1.6	5.00E-04	NA	7.13E-06	NA	1.31E-06
Methoxychlor	0.0027	160	5.00E-03	NA	4.28E-07	NA	7.86E-08
Aroclor-1242	0.15	1.6	NA	7.70E+00	NA	9.18E-08	NA
Aroclor-1248	0.14	1.6	NA	7.70E+00	NA	8.57E-08	NA
Aroclor-1254	0.003	1.6	2.00E-05	NA	1.19E-04	NA	2.18E-05
Inorganics							
Cobalt	29.1	202	6.00E-02	NA	3.84E-04	NA	7.06E-05
Copper	35.6	100	4.00E-02	NA	7.05E-04	NA	1.29E-04
Selenium	1.5	5.2	5.00E-03	NA	2.38E-04	NA	4.36E-05
Thallium	2.7	2.9	7.00E-05	NA	3.06E-02	NA	5.61E-03
Risk					**3.21E-02**	**5.33E-07**	**5.90E-03**

TABLE 12

RESIDENTIAL RISK ESTIMATES - SOIL INGESTION
SITE 4 REMOVAL ACTION
NAWC WARMINSTER, PENNSYLVANIA

Chemical of Potential Concern	Soil Conc. (mg/kg)	leanup Leve Goal (mg/kg)	Reference Dose (mg/kg/day)	Slope Factor kg-day/mg	Hazard Quotient (Child Soil Ingestion	Cancer Risk Soil Ingestion	Hazard Quotient (Adult) Soil Ingestion
Volatile Organics							
Acetone	0.008	0.03	1.00E-01	NA	1.02E-06	NA	1.10E-07
Chlorobenzene	0.001	3.6	2.00E-02	NA	6.39E-07	NA	6.85E-08
Ethylbenzene	0.003	64	1.00E-01	NA	3.84E-07	NA	4.11E-08
Methylene chloride	0.006	0.3	6.00E-02	7.50E-03	1.28E-06	7.05E-11	1.37E-07
Toluene	0.14	92	2.00E-01	NA	8.95E-06	NA	9.59E-07
Trichlorofluromethane	0.0002	120	3.00E-01	NA	8.52E-09	NA	9.13E-10
Xylenes, total	0.023	920	2.00E+00	NA	1.47E-07	NA	1.58E-08
Semivolatile Organics							
Acenaphthene	0.049	30	6.00E-02	NA	1.04E-05	NA	1.12E-06
Anthracene	0.09	70	3.00E-01	NA	3.84E-06	NA	4.11E-07
Benzo(a)anthracene	0.48	1.5	NA	7.30E-01	NA	5.49E-07	NA
Benzo(a)pyrene	0.42	0.6	NA	7.30E+00	NA	4.80E-06	NA
Benzo(b)fluoranthene	0.48	4.5	NA	7.30E-01	NA	5.49E-07	NA
Benzo(g,h,i)perylene	0.28	500	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.21	45	NA	7.30E-02	NA	2.40E-08	NA
Bis(2-ethylhexyl)phthal	2.6	300	2.00E-02	NA	1.66E-03	NA	1.78E-04
Chrysene	0.48	150	NA	7.30E-03	NA	5.49E-09	NA
Dibenzo(a,h)anthracen	0.069	0.6	NA	7.30E+00	NA	7.89E-07	NA
Fluoranthene	0.66	400	4.00E-02	NA	2.11E-04	NA	2.26E-05
Indeno(1,2,3-cd)pyrene	0.26	6	NA	7.30E-01	NA	2.97E-07	NA
Phenanthrene	0.4	80	NA	NA	NA	NA	NA
Pyrene	0.61	300	3.00E-02	NA	2.60E-04	NA	2.79E-05
Pesticides/PCBs							
4,4'-DDT	0.0045	1.6	5.00E-04	NA	1.15E-04	NA	1.23E-05
Methoxychlor	0.0027	160	5.00E-03	NA	6.90E-06	NA	7.40E-07
Aroclor-1242	0.15	1.6	NA	7.70E+00	NA	1.81E-06	NA
Aroclor-1248	0.14	1.6	NA	7.70E+00	NA	1.69E-06	NA
Aroclor-1254	0.003	1.6	2.00E-05	NA	1.92E-03	NA	2.05E-04
Inorganics							
Cobalt	29.1	202	6.00E-02	NA	6.20E-03	NA	6.64E-04
Copper	35.6	100	4.00E-02	NA	1.14E-02	NA	1.22E-03
Selenium	1.5	5.2	5.00E-03	NA	3.84E-03	NA	4.11E-04
Thallium	2.7	2.9	7.00E-05	NA	4.93E-01	NA	5.28E-02
Risk					**5.19E-01**	**1.05E-05**	**5.56E-02**

TABLE 13

RISKS FROM GROUNDWATER BASED ON SITE SOIL CONCENTRATIONS
SITE 4 REMOVAL ACTION
NAWC WARMINSTER, PENNSYLVANIA

Chemical of Potential Concern	Kd (1)	Site Concentration (mg/kg)	Estimated GW Conc. (mg/L) (2)	RBC (tap water) (mg/L) (3)	Cancer Risk (4)
Semivolatile Organics					
Benzo(a)anthracene	7.96E+02	0.48	3.02E-05	9.20E-05	3.28E-07
Benzo(b)fluoranthene	2.46E+03	0.48	9.76E-06	9.20E-05	1.06E-07
Benzo(k)fluoranthene	2.46E+03	0.21	4.27E-06	9.20E-04	4.64E-09
Benzo(g,h,i)perylene	3.20E+03	0.28	4.38E-06	1.50E+00	2.92E-12
Benzo(a)pyrene	2.04E+03	0.42	1.03E-05	9.00E-06	1.14E-06
Acenaphthene	1.42E+01	0.049	1.73E-04	2.20E+00	7.84E-11
Anthracene	5.90E+01	0.09	7.63E-05	1.10E+01	6.93E-12
Bis(2-ethylhexyl)phthalate	3.02E+04	2.6	4.30E-06	4.80E-03	8.97E-10
Chrysene	7.96E+02	0.48	3.02E-05	9.20E-03	3.28E-09
Dibenz(a,h)anthracene	7.60E+03	0.069	4.54E-07	9.20E-06	4.93E-08
Fluoranthene	2.14E+02	0.66	1.54E-04	1.50E+00	1.03E-10
Indeno(1,2,3-cd)pyrene	6.94E+03	0.26	1.87E-06	9.20E-05	2.04E-08
Phenanthrene	2.80E+01	0.4	7.14E-04	1.50E+00	4.76E-10
Pyrene	2.10E+02	0.61	1.45E-04	1.10E+00	1.32E-10
Volatile Organics					
Acetone	1.15E-03	0.008	3.48E-01	3.70E+00	9.40E-08
Chlorobenzene	4.38E-01	0.001	1.14E-04	3.90E-02	2.93E-09
Ethylbenzene	7.26E-01	0.003	2.07E-04	1.30E+00	1.59E-10
Methylene chloride	2.34E-02	0.006	1.28E-02	4.10E-03	3.13E-06
Toluene	3.64E-01	0.14	1.92E-02	7.50E-01	2.56E-08
Trichlorofluoromethane	3.18E-01	0.0002	3.14E-05	1.30E+00	2.42E-11
Xylenes, total	7.78E-01	0.023	1.48E-03	1.20E+01	1.23E-10
Pesticides/PCBs					
4,4'DDT	5.26E+03	0.0045	4.28E-08	2.00E-04	2.14E-10
Methoxychlor	1.95E+02	0.0027	6.91E-07	1.80E-01	3.84E-12
Aroclor-1242	6.18E+02	0.15	1.21E-05	8.70E-06	1.39E-06
Aroclor-1248	6.18E+02	0.14	1.13E-05	8.70E-06	1.30E-06
Aroclor-1254	6.18E+02	0.003	2.43E-07	7.30E-04	3.32E-10

TABLE 13

RISKS FROM GROUNDWATER BASED ON SITE SOIL CONCENTRATIONS
SITE 4 REMOVAL ACTION
NAWC WARMINSTER, PENNSYLVANIA

Chemical of Potential Concern	Kd (1)	Site Concentration (mg/kg)	Estimated GW Conc. (mg/L) (2)	RBC (tap water) (mg/L) (3)	Cancer Risk (4)
Inorganics					
Cobalt	4.50E+01	29.1	3.23E-02	2.20E+00	1.47E-08
Copper	3.50E+01	35.6	5.09E-02	1.50E+00	3.39E-08
Selenium	5.00E+00	1.5	1.50E-02	1.80E-01	8.33E-08
Thallium	7.10E+01	2.7	1.90E-03	2.60E-03	7.31E-07
RISK					8.47E-06

1 Kd value was obtained from the "Soil Screening Guidance: User's Guide" or calculated as Koc x 0.002.
2 Estimated GW Concentraion is the Soil Concentration/Kd/Dilution Attenuation Factor default of 20.
3 RBC value is the RBC value for tap water.
The RBC tap water value for naphthalene was used as a surrogate for noncarcinogenic PAHs.
4 Calculated from a ratio: Site Cancer Risk from GW = (Estimated GW Conc./RBC tap water) x 0.000001.

ATTACHMENT A

VERIFICATION SAMPLING AND ANALYSIS PLAN
SITE 4 REMOVAL ACTION
NAWC WARMINSTER, PENNSYLVANIA

1.0 INTRODUCTION

In response to Contract Task Order No. 159 under Contract No. N62472-90-D-1298, Brown & Root (B&R) Environmental, a division of Halliburton NUS Corporation (HNUS), has been tasked to perform verification sampling and analysis for Site 4 (North Runway Landfill) at the Naval Air Warfare Center (NAWC), Warminster, Pennsylvania. The Navy is planning to conduct a removal action at this site beginning in July 1996. This sampling and analysis plan (SAP) describes the requirements and specific procedures for field work to be conducted as part of the Site 4 removal action.

The Navy's remedial action contractor, Foster Wheeler, will implement this removal action in accordance with the work plan it prepared. B&R Environmental will conduct sampling and analysis to confirm that soils left in place do not present a threat to human health and the environment. The analytical data will be used to determine whether any further removal action is required. If additional excavation is warranted, additional sampling and analysis will be performed to confirm that the target risk levels have been achieved.

This SAP has been abbreviated to focus on the development of target concentrations protective of human health and the environment, the verification sampling strategy, field procedures (including sampling and analysis requirements), and reporting. A detailed discussion of applicable quality assurance/quality control (QA/QC) measures and procedures is included in the Phase III Remedial Investigation (RI) Quality Assurance Project Plan (QAPP) (HNUS, 1995a).

2.0 SITE BACKGROUND

The nature and extent of contamination and the results of previous investigations at Site 4 are presented in the Site 4 Engineering Evaluation/Cost Analysis (EE/CA) Report (HNUS, 1995b). Based on field investigations, there are eight trenches at Site 4. The trenches average about 12 feet wide and 8 feet deep and range from 150 to 490 feet in length. The subsurface fill within the trenches averages 4 to 5 feet in thickness.

2.1 Nature And Extent Of Contamination

The material encountered during the April 1995 test pit excavations generally consisted of a top layer of clean, silty clay fill underlain by a bluish-gray micaceous silt and/or a layer of refuse or construction/demolition debris, clayey silt, and weathered siltstone. The micaceous silt was also encountered generally between 2 and 4 feet below the ground surface in about one-half of the test pits. Some test pits encountered siltstone or gray sandstone bedrock.

Refuse, consisting of paper, plastic products, soda and beer cans, glass bottles, styrofoam, cardboard, and photographic film, was found in nearly all test pits and trenches at Site 4. Construction/demolition debris, consisting of wood, metal, concrete, brick, cables, wire, and steel, was also encountered in two trenches.

2.2 Scope Of The Removal Action

The action selected for Site 4 was excavation of contaminated soils and buried wastes and disposal at an approved landfill. The volume of contaminated soils and buried wastes at Site 4 is estimated to be approximately 7,900 cubic yards or 12,800 tons. Based on site characterization information, it does not appear that contaminants have significantly migrated from the eight trenches identified at Site 4, as described in the EE/CA report (HNUS, 1995b).

This removal action addresses wastes and contaminated soils at Site 4. Groundwater in this area is being addressed by a separate remedial action. This removal action will eliminate the potential for human exposure to the contaminants and potential migration of contaminants into the environment.

3.0 SITE 4 REMOVAL ACTION TARGET CLEANUP LEVELS

3.1 Technical Approach

The approach followed to develop the target cleanup concentrations for this removal action considered both Pennsylvania Department of Environmental Protection (PADEP) generic cleanup levels and risk-based concentrations developed specifically for the site, using exposure assumptions consistent with the future land use currently planned for the site after base closure (recreational use). The PADEP cleanup levels considered were the residential use levels rather than the nonresidential (industrial) land use levels, since recreational use is more closely aligned with a residential scenario than a nonresidential usage scenario. Risk-based concentrations designed to be protective of human receptors under the projected land use scenario (recreational use) were developed through procedures outlined in and consistent with EPA Region III guidance entitled Risk-Based Concentration Table, January - June, 1996 (EPA, 1996a), EPA Risk Assessment guidance, and EPA Soil Screening guidance. Risk-based concentrations developed to be protective of groundwater were developed in accordance with EPA guidance outlined in Soil Screening Guidance: User's Guide (EPA, 1996b). All risk assessment methods used to develop risk-based concentrations are consistent with current EPA risk assessment procedures outlined in the EPA guidance documents identified above.

3.2 Identification of Target Compounds

Limited evidence of groundwater impact has been detected in monitoring wells located downgradient of Site 4. Specifically, trichloroethene (TCE), cis-1,2-dichloroethene, and carbon tetrachloride have been detected, albeit at concentrations below the Maximum Contaminant Levels promulgated under the Safe Drinking Water Act. In addition, thallium was detected in groundwater at one well cluster. Although thallium is a naturally-occurring chemical, it was not detected in background samples. This chemical could be attributable to Site 4, although this constituent was not detected in soil samples collected at the site during previous investigative efforts. As a result of the detection of these chemicals in downgradient groundwater, risk-based target concentrations have been developed for these chemicals although only TCE was detected in soil samples collected at the site.

In the Site 4 EE/CA Report (HNUS, 1995b), comparisons of site-related subsurface soil data were made to risk-based concentrations, background levels, and relevant "to be considered" (TBC) criteria (refer to Tables 1-2 and 1-3 in the EE/CA report). The following criteria were applied to those chemicals that exceeded TBC criteria to identify a subset of chemicals to be used for the development of preliminary target concentrations for the removal action.

- Chemicals were eliminated that had low frequency of detection in subsurface soils [pentachlorophenol - 1 of 18 samples, dibenz(a,h)anthracene - 2 of 18 samples, dieldrin - 1 of 18 samples, endosulfan sulfate 1 of 18, , and cadmium - 1 of 18 samples].

- Arsenic, beryllium, chromium, and manganese were eliminated because the site-related data were not considered statistically higher (or significantly different) than the background data. The Mann-Whitney U-test was used to determine whether the site-related and background data were from populations with identical medians (EPA, 1991).

- Nickel was also eliminated because the associated soil concentrations were similar to the migration to groundwater screening criteria and did not exceed any soil TBC screening criteria. Also, nickel was not considered to be very mobile in the environment.

The following chemicals were retained for the development of risk-based target concentrations:

- Benz(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Polychlorinated biphenyls (PCBs)
- Trichloroethene (TCE)
- Thallium
- cis-1,2-Dichloroethene
- Carbon tetrachloride

3.3 Establishment of Target Cleanup Levels

Site 4 removal action target concentrations are established below for the preceding eight chemicals. However, if additional chemicals are detected during verification sampling and analysis, the potential human health impacts of these constituents will also be considered.

3.3.1 State Standards

PADEP generic human health standards for incidental ingestion of residential soils were considered as potential remediation standards (PADEP, 1995; PADEP, 1996). The applicable generic cleanup levels are shown in Table 1.

TABLE 1
PADEP GENERIC CLEAN-UP LEVELS
SITE 4 REMOVAL ACTION

CHEMICAL OF POTENTIAL CONCERN	CLEAN-UP LEVEL (1)
Benz(a)anthracene	6 mg/kg
Benzo(a)pyrene	0.6 mg/kg
Benzo(b)fluoranthene	6 mg/kg
PCBs	5 mg/kg
Trichloroethene	400 mg/kg
cis-1,2-Dichloroethene	800 mg/kg
Carbon tetrachloride	30 mg/kg
Thallium	6 mg/kg

(1) PADEP, 1995 and PADEP, 1996.

3.3.2 Risk-based Soil Ingestion Target Levels

In addition, risk-based target concentrations were also developed based on EPA guidance as described in Section 2.1, assuming a future recreational land use scenario. An incremental cancer risk of 10^{-6} and Hazard Quotient of <1 (for noncarcinogenic effects) were the target risk levels for each contaminant. Attachment A provides the assumptions, procedures, calculations, and results. Table 2 lists the resulting target concentrations for the chemicals of potential concern.

TABLE 2
RISK-BASED TARGET CONCENTRATIONS
RECREATIONAL LAND USE
SITE 4 REMOVAL ACTION

CHEMICAL OF POTENTIAL CONCERN	TARGET CONCENTRATION
Benz(a)anthracene	17 mg/kg
Benzo(a)pyrene	1.7 mg/kg
Benzo(b)fluoranthene	17mg/kg
PCBs	1.6 mg/kg
Trichloroethene	1,100 mg/kg
cis-1,2-Dichloroethene	13,000 mg/kg
Carbon tetrachloride	97 mg/kg
Thallium	100 mg/kg

3.3.3 Groundwater Protection Target Levels

Target soil concentrations were also developed based on protection of groundwater. As previously discussed the EPA's Soil Screening Guidance was used as the basis for the development of target soil concentrations considered protective of groundwater. Attachment A provides a summary of the development process for groundwater protection using this guidance. Groundwater protection target concentrations were developed such that Maximum Contaminant Level (MCL) concentrations will not be exceeded in the groundwater. For contaminants with no MCL, health-based limits presented in the EPA's Soil Screening Guidance (EPA, 1996) are used in place of the MCL's in calculating target soil concentrations. The target concentrations for groundwater protection based on the Soil Screening Guidance are summarized in Table 3. Table 3 also includes PADEP's target cleanup levels for protection of groundwater.

TABLE 3
GROUNDWATER PROTECTION-BASED TARGET CONCENTRATIONS
SITE 4 REMOVAL ACTION

CHEMICAL OF POTENTIAL CONCERN	PADEP TARGET CONCENTRATIONS	TARGET CONCENTRATION
Benz(a)anthracene	500 mg/kg	1.4 mg/kg
Benzo(a)pyrene	500 mg/kg	7.33 mg/kg
Benzo(b)fluoranthene	500 mg/kg	7.06 mg/kg
PCBs	NA mg/kg	5.5 mg/kg
Trichloroethene	2 mg/kg	0.46 mg/kg
cis-1,2-Dichloroethene	7 mg/kg	6.4 mg/kg
Carbon tetrachloride	0.5 mg/kg	0.46 mg/kg
Thallium	NA	2.4 mg/kg

3.3.4 Final Target Cleanup Level Development

Final target concentrations were identified by comparing both PADEP and risk-based levels protective of recreational land use and groundwater use and selecting the lowest target concentration for each chemical of potential concern. Based on this comparison, Table 4 presents the lowest target concentrations obtained from the target cleanup levels in Tables 1, 2, and 3:

TABLE 4
FINAL TARGET CONCENTRATIONS
SITE 4 REMOVAL ACTION

CHEMICAL OF POTENTIAL CONCERN	BASIS	TARGET CONCENTRATION
Benz(a)anthracene	Groundwater Protection	1.4 mg/kg
Benzo(a)pyrene	PADEP	0.6 mg/kg
Benzo(b)fluoranthene	PADEP	6 mg/kg
PCBs	Recreational Use	1.6 mg/kg
Trichloroethene	Groundwater Protection	0.46 mg/kg
cis-1,2-Dichloroethene	Groundwater Protection	6.4 mg/kg
Carbon tetrachloride	Groundwater Protection	0.46 mg/kg
Thallium	Groundwater Protection	2.4 mg/kg

The National Contingency Plan (NCP) indicates that the overall objective of remedial action should be the protection of human health such that the excess upper bound lifetime cancer risk to an individual falls between 10^{-4} to 10^{-6} and systemic toxicants do not pose the threat of any adverse effects. The NCP requires that where multiple contaminants or contaminant pathways exist, that remedial action objectives consider the cumulative effect of these contaminants and pathways and that "the 10^{-6} risk level shall be used as the point of departure for determining remediation goals." In this case, given the target cleanup levels for individual contaminants indicated in Table 4, the maximum potential cumulative carcinogenic risks under the recreational land use, residential land use, and groundwater ingestion scenarios are 1.8×10^{-6}, 3.5×10^{-5}, and $5.6\text{-}\times 10^{-5}$ respectively, each falling within the 10^{-4} to 10^{-6} risk range. (See Attachment A for a summary of projected risks under various land use scenarios.) Table 5 summarizes the individual and cumulative incremental carcinogenic risks posed by the target contaminants at the preliminary target concentrations presented in Table 4. Thallium and cis-1,2-DCE are not included in Table 5 as they are not carcinogens. Given that a protective cover of 2-3 feet of clean fill will be placed and maintained at this site, and that it is unlikely that all of the compounds listed in Tables 4 and 5 will be encountered at any single location at the maximum allowable levels, meeting the target cleanup levels in Table 4 should be protective of human health in this case (recreational/residential land use).

TABLE 5
CARCINOGENIC RISK SUMMARY
PRELIMINARY TARGET CLEANUP LEVELS
SITE 4 REMOVAL ACTION

CHEMICAL OF POTENTIAL CONCERN	RECREATIONAL LAND USE	RESIDENTIAL LAND USE	GROUNDWATER INGESTION
Benz(a)anthracene	8.2E-08	1.6E-06	1.1E-06
Benzo(a)pyrene	3.5E-07	6.8E-06	1.8E-06
Benzo(b)fluoranthene	3.5E-07	6.8E-06	1.9E-06
PCBs	1.0E-06	1.9E-05	1.7E-05
Trichloroethene	4.2E-10	7.9E-09	3.1E-06
Carbon tetrachloride	4.7E-09	9.4E-08	3.1E-05
TOTAL	1.8E-6	3.5E-05	5.6E-05

It should be apparent that a fixed, comprehensive list of clean-up goals for all contaminants that will be encountered cannot be developed prior to implementation of the removal action, primarily since the identity of all of the chemicals of potential concern that may be encountered at any given location is unknown. In the event that contaminants additional to those listed in Table 4 are detected at levels which present a potential threat to human health and the environment, the procedures used to develop the target concentrations identified in Table 4 will be used to identify or modify target cleanup levels as needed, based on the referenced guidance.

The final target cleanup levels are also expected to be protective of the environmental pathways. Since the site is to be covered with 2-3 feet of clean fill, migration of contaminants via surface water runoff is not a concern. The establishment of target cleanup levels protective of groundwater should also be protective of any nearby surface water bodies that receive groundwater discharge.

4.0 FIELD PROCEDURES

The field procedures outlined in this section describe the collection of soil samples to verify the acceptability of soils remaining after waste excavation activities are completed.

4.1 Removal Verification Soil Sampling

All wastes, clearly stained soils, and soils with elevated (> 1 ppm) photoionization detector (PID) readings will be removed from the trenches by the Navy. After removal of the wastes/soils, confirmation sampling will be performed on the soils left in-place along the excavation bottom and sides, to confirm that the remaining soils meet the cleanup standards. The sampling strategy consists of obtaining at least two random samples (one sidewall and one bottom or floor sample) for every 50-foot interval of trench (116 random samples total), one sample from each end of each trench (16 samples total), plus biased sampling at locations where soils were removed based on visual observation or PID readings (estimated 8 samples total). Attachment B describes the random sampling strategy in more detail, including the statistical basis for determining the appropriate number of samples to be taken to verify that the cleanup is adequate. The sampling strategy is based on PADEP guidance for soil clean-up actions (PADEP, 1995), and considered EPA guidance regarding determination of sample size, as presented in the Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media (EPA, 1989). The number of samples required under the PADER guidance was higher than the number required based on EPA guidance, thus the PADER approach was used as the basis for this sampling program.

The random sampling will be performed within each 50-foot trench segment, using varying, field-determined distances along each trench segment, and alternating the side from which the sidewall samples are taken. A random number generator (or random number table) will be used to determine the location within each interval where samples will be collected.

Biased soil samples will be taken from areas considered likely to have residual contamination, based on visual observations, PID readings, or other indicators (e.g., stained soils, construction debris, changes in soil type, changes in soil characteristics). For planning purposes, it is assumed that one biased sample will be taken from each trench (a total of eight samples). These samples will be collected after the soil of concern has been removed, to confirm that target concentrations are met.

For those trench segments where a floor sample cannot be collected (e.g., due to the presence of bedrock), an additional sidewall sample will be taken for that interval.

Soil samples will be obtained directly from the trench, if the excavation is less than 4 feet deep, or directly from the backhoe bucket, using dedicated stainless-steel trowels. The samples will be placed in the appropriate containers, labeled, and preserved as described in the Phase III RI QAPP (HNUS, 1995a). Sampling procedures and other field operations (e.g., decontamination, record keeping, sample packaging and shipping) will also be in accordance with the Phase III RI QAPP. Sample locations will be documented by measuring the distances from each location to at least two reference points. Sampling locations will also be temporarily field marked with wooden stakes.

4.2 Sample Analytes

A total of 140 samples (excluding QA/QC samples) are projected to be taken during the verification sampling. Full TAL metal and Target Compound List (TCL) organic analyses [including volatile organic compounds (VOCs), semivolatile organic compounds, pesticides, and PCBs] will be performed for 20% (28) of the samples, including all samples from areas where soils were excavated due to visual/PID evidence of potential contamination. All remaining samples (112) will be analyzed for purgeable halocarbons, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and thallium, which covers the target compounds identified from previous site-related work. Detection limits for the analytes will be below the target cleanup levels, to ensure that adequate cleanup has occurred and can be confirmed.

Analytical results for the soil samples will be reported by the laboratory within 48 hours of sample receipt. Table 6 lists the sampling and analysis requirements for the Site 4 removal action verification samples.

TABLE 6
SAMPLING AND ANALYSIS REQUIREMENTS FOR SITE 4 REMOVAL ACTION
NAWC WARMINSTER, PENNSYLVANIA

NUMBER OF SAMPLES(a)	FIELD DUPLICATES	FIELD BLANKS	RINSATE BLANKS	TRIP BLANKS	ANALYSES	SOURCE OF ANALYSIS
28 (b)	2	1	2	8	TCL Volatile Organics	SW 846 8240
112	11	1	6	6	Purgeable Halocarbons	SW 846 8010
28 (b)	2	1	2	0	TAL Metals (d)	SW 846 6010/7471
112	11	1	6	0	Thallium	SW 846 3050/7840
28 (b)	2	1	2	0	TCL Semivolatile Organics	SW 846 8270
112	11	1	6	0	PAH's	SW846 8310
28(b)	2	1	2	0	TCL Pesticides/PCBs	SW 846 8080
112	11	1	6	0	PCBs	SW 846 8080

Notes:

(a) Number of samples estimated, may vary based on conditions encountered.
(b) 20% of the 140 samples to be collected undergo full TCL/TAL analyses
(c) Using graphite furnace and inductively coupled plasma (ICP).

4.3 Confirmation Of Cleanup Objective Attainment

Several statistical approaches can be utilized to confirm that the overall remediation successfully meets the established cleanup objectives. Assuming that a statistically valid number of samples has been taken, several statistical approaches can be followed to verify adequate cleanup. The statistical approaches allow for a minor number of exceedances of cleanup standards, as long as the upper 95% confidence limit on the mean concentrations fall below the established standards.

Compliance with the narrative clean-up objectives will be assessed through completion of risk assessment calculations. The upper 95% confidence limit on the mean concentrations will be determined for each detected chemical. These values will be used to determine hypothetical risks under the recreational, residential, and groundwater protection scenarios. It is possible that the analytical results will be segregated spatially based on the extent of contamination. This procedure may be used since it is considered unlikely that the identity of the chemical constituents will be consistent across the various trenches, and possibly along the length of the trenches to be excavated. In addition, the power of the statistical tests will also be assessed versus an alpha of 5% and a beta of 20%.

As per EPA's Methods for Evaluating the Attainment of Cleanup Standards Volume I: Soils and Solid Media (EPA, 1989), a statistical determination will be made regarding whether the mean concentrations of the currently identified and any new target compounds are less than the target cleanup levels using the formula for upper one-sided confidence interval for the true mean contamination when a systematic sample is treated as a stratified sample, as presented on page 6-24 of the above guidance document.

5.0 QUALITY ASSURANCE DOCUMENTATION

QA/QC guidelines and procedures for sample handling and documentation will be consistent with those presented in the QAPP for Phase III RI activities (HNUS, 1995a).

The Naval Facilities Engineering Service Center (NFESC) QA guide will be followed, since the data will be used to verify the effectiveness of the Site 4 removal action. QA/QC samples will include equipment rinsate blanks, field duplicates, field blanks, and trip blanks. QA/QC samples will be analyzed for the same parameters as the related samples.

Analytical data will undergo full data validation since the results will be used to complete risk assessment calculations to confirm clean closure. All data will be reviewed by a technical supervisor and approved for release by the project manager.

For all soil samples, the laboratory will also analyze matrix spikes (MS) and matrix spike duplicates (MSD). The duplicate will be taken from the same sample that will become the laboratory MS/MSD for organics or for the sample used as a duplicate in inorganic analysis.

6.0 PROJECT MILESTONES AND SCHEDULE

The project schedule for the Site 4 removal action will be established by the Navy, in consultation with Foster Wheeler. Actual excavation activities are estimated to last about 2 to 3 weeks. Preliminary analytical results will be available in 48 hours, and complete analytical data packages will be available in about 35 days. Preliminary results will be tabulated and distributed to the Navy design group and the BRAC Cleanup Team (BCT) members on an expedited basis, so that decisions can be made regarding the need for additional excavation while Foster Wheeler is on site.

The draft post removal action report should be completed about 1 month after all analytical results are received and evaluated. This report will summarize the removal operation and the actions taken and will contain the following information:

- Summary of events
- Analytical results
- Sample location maps
- Effectiveness of the removal action taken
- Difficulties encountered (if necessary)
- Recommendations (if necessary)

The draft report will be submitted for technical review, revised in response to comments, and then finalized.

REFERENCES

Environmental Protection Agency, 1989. Methods for Evaluating for Attainment of Cleanup Standards. Volume 1: Soils and Solid Media. EPA/230/02-89/042. Washington, DC.

Environmental Protection Agency, 1990. Quality Assurance/Quality Control Guidance for Removal Activities; Sampling QA/QC Plan and Data Validation Procedures, Interim Final. EPA/540/G-90/004. Washington, DC.

Environmental Protection Agency, 1991. Human Health Evaluation Manual, Part B: Development of Risk-Based Preliminary Remediation Goals. Office of Solid Waste Permits and State Programs Division. Washington, DC.

Environmental Protection Agency, 1992. Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities; Addendum to Interim Final Guidance. Office of Solid Waste Permits and State Programs Division. Washington, DC.

Environmental Protection Agency, 1993. Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA. EPA/540/R-93-167. Washington, DC.

Environmental Protection Agency, 1996a. Risk-Based Concentration Table, January-June 1996. Region III, Philadelphia, Pennsylvania.

Environmental Protection Agency, 1996b. Soil Screening Guidance: User's Guide. EPA/540/R-96/018. Washington, DC.

Foster Wheeler, 1996. Draft Work Plan for Site 4 Removal Action at NAWC Warminster, Pennsylvania. Langhorne, Pennsylvania.

Halliburton NUS Corporation, 1994. Remedial Investigation Report for Operable Unit 3 (OU-3) for NAWC Warminster, Pennsylvania. Wayne, Pennsylvania.

Halliburton NUS Corporation, 1995a. Phase III Remedial Investigation Quality Assurance Project Plan for NAWC Warminster, Pennsylvania. Wayne, Pennsylvania.

Halliburton NUS Corporation, 1995b. Site 4 Engineering Evaluation and Cost Analysis (EE/CA) Report for NAWC Warminster, Pennsylvania. Wayne, Pennsylvania.

Naval Facilities Engineering Service Center, 1996. Navy Installation Restoration Laboratory Quality Assurance Guide: Interim Guidance Document. Port Hueneme, California.

Pennsylvania Department of Environmental Protection, 1995. Technical Guidance Manual for Land Recycling Program. Harrisburg, Pennsylvania.

Pennsylvania Department of Environmental Protection, 1996. Revision 1 to Appendix B2: Statewide Human Health Standards (as contained in Technical Guidance Manual for Land Recycling Program). Harrisburg, Pennsylvania.

ATTACHMENT A

TARGET CLEANUP LEVEL CALCULATIONS

ATTACHMENT A
DEVELOPMENT OF RISK-BASED TARGET CONCENTRATIONS - WARMINSTER RECREATION LAND USE SCENARIO

OBJECTIVE:

Develop risk-based target concentrations for soil removal at the Naval Surface Warfare Center Warminster based on a recreational land use (community park) scenario. Determine the residual risks associated with the target concentrations assuming residential land use. No guidance currently exists for recreational land use. Professional judgment and personal experience will be used to identify appropriate input parameters.

ASSUMPTIONS:

- Soil ingestion constitutes the primary exposure pathway.
- The EPA Region III risk-based concentration equation for soil ingestion is appropriate.
- Recreational activities involving soil contact occur 8 months of the year (seasonal conditions).
- The community park will be visited by receptors 4 days per week.
- Exposure occurs from the ages of 1 to 17. Children/youths are the most sensitive receptors.
- Average body weights for the ages of 1 to 5 and 6 to 17 can be used in the intake equation.
- The intake rate (soil ingestion rate) is 200 mg/day for the 1 to 5 year old receptor.
- The intake rate (soil ingestion rate) is 100 mg/kg for the 6 to 17 year old receptor.
- The exposure frequency may be prorated based on the exposure period (hours per day).

SAMPLE CALCULATIONS:

As per EPA Region III guidance (with minor modifications to account for recreational land use) as outlined in the Risk-Based Concentration Tables dated April 19. 1996, the equations used to determine the carcinogenic and noncarcinogenic risk-based concentrations for soil ingestion are as follows:

$$RBC_{rec} = \frac{TR \ x \ AT_c \ x \ CF}{EF \ x \ IFS_{adj} \ x \ SF_o}$$

$$RBC_{rec} = \frac{THQ \ x \ RfD_o \ x \ BW_c \ x \ AT_n \ x \ CF}{EF \ x \ ED_c \ x \ IRS_c}$$

Where:

RBC_{rec} is the risk-based concentration based on recreational land use (mg/kg)
TR is the target cancer risk (dimensionless)
THQ is the target Hazard Quotient (dimensionless)
AT_c is the averaging time for carcinogenic effects (days)
AT_n is the averaging time for noncarcinogenic effects (days)
BW_c is the child receptor body weight (kg)
CF is a conversion factor (mg/kg)
EF is the exposure frequency (days/year)
IFS_{adj} is the age-adjusted soil ingestion rate (mg yr/kg day)
IFS_c is the child soil ingestion rate (mg/day)
SF_0 is the oral cancer slope factor $(mg/kg/day)^{-1}$
RfD_0 is the oral reference dose (mg/kg/day)

The exposure frequency (EF) may be determined based on the seasonal assumption, the weekly frequency, and the daily exposure time. It is assumed that soil ingestion occurs during a sixteen hour waking period. Hence a factor of 3/16 is used to prorate the exposure duration, as follows:

$$EF = 8\frac{months}{year} \times 4\frac{weeks}{month} \times 4\frac{days}{week} \times \frac{3\ hours/day}{16\ hours/day} = 24\frac{days}{year}$$

The average receptor body weights (BW) over the exposure periods were obtained via discussion with EPA Region III personnel. The average body weight for the 1 to 6 year old is 16.6 kg and the average body weight for the 6 to 17 year old is 45.2 kg. For the purposes of this assessment it is assumed that the exposure duration (ED) = 17 -1 = 16 years.

In accordance with EPA Region III policy (as outlined in the Risk-Based Concentration Table dated April 19, 1996) the age-adjusted soil ingestion factor may be determined as follows:

$$IFS_{adj} = \frac{ED_c \times IRS_c}{BW_c} + \frac{(ED_{tot} - ED_c) \times IRS_a}{BW_a}$$

Where:

IFSadj = the age-adjusted soil ingestion factor (mg yr/kg day)
EDc = the child exposure duration (years)
EDtot = the total exposure duration (years)
IRSc = the child soil ingestion rate (mg/day)
IRSa = the adolescent soil ingestion rate (mg/day)
BWc = the child body weight (kg)
BWa = the adolescent body weight (kg)

Using the previously specified input parameters, the age-adjusted soil ingestion rate may be determined as follows:

$$IFS_{adj} = \frac{5\ years \times 200\ mg/day}{16.6\ kg} + \frac{(16\ years - 5\ years) \times 100\ mg/day}{45.2\ kg} = 84.6\frac{mg\ yr}{kg\ day}$$

The averaging time (AT) for carcinogenic effects is set as 70 years (25,550 days) by default and the averaging time for noncarcinogenic effects is set as the child exposure duration (5 years x 365 days/year = 1,825 days).

The input parameters for determination of the recreational risk-based concentrations may be summarized as follows:

Parameter	Noncarcinogens	Carcinogens
Target Risk	NA	1E-06
Target Hazard Quotient	1.0	NA
Age-adjusted Soil Ingestion Rate (mg yr/kg day)	NA	84.6
Child Soil Ingestion Rate (mg/day)	200	NA
Exposure Frequency (days/yr)	24	24
Exposure Duration (years)	5	16
Child Body Weight (kg)	16.6	16.6
Averaging Time (days)	1,825	25,550

Conversion factors (dose-response parameters to risk-based concentrations) may be determined for noncarcinogenic and carcinogenic effects, respectively, as follows:

$$RBC_c = \frac{1E-6 \; x \; 25{,}550 \; days \; x \; 10^6 \; \frac{mg}{kg}}{24 \; days \; x \; 84.6 \; \frac{mg \; yr^6}{kg \; day} \; x \; SF_o \; \frac{kg \; day}{mg}} = \frac{12.6}{SF_o} \frac{mg}{kg}$$

$$RBC_{nc} = \frac{1.0 \; x \; RfD_o \; \frac{mg}{kg \; day} \; x \; 16.6 \; kg \; x \; 1{,}825 \; days \; x \; 10^6 \; \frac{mg}{kg}}{24 \; \frac{days}{year} \; x \; 5 \; years \; x \; 200 \; \frac{mg}{day}} = 1.26E+06 \; x \; RfD_o \; \frac{mg}{kg}$$

DOSE-RESPONSE PARAMETERS:

Eight chemicals of potential concern (COPC) have been identified for the site, six of which exhibit potential carcinogenic effects. The COPCs and associated dose-response parameters are as follows:

COPC	RfD (mg/kg/day)(1)	SF (mg/kg/day)$^{-1}$(1)
Benz(a)anthracene	NA(2)	7.30E-01
Benzo(a)pyrene	NA	7.30E+00
Benzo(b)fluoranthene	NA	7.30E-01
Polychlorinated biphenyls	NA	7.70E+00
Trichloroethene	6.00E-03	1.10E-02
cis-1,2-Dichloroethene	1.00E-02	NA
Carbon tetrachloride	7.00E-04	1.30E-01
Thallium(3)	8.00E-05	NA

1 - Source: Risk-Based Concentration Table, January - June, 1996. USEPA Region III.
2 - NA - Not Available.
3 - Assumed to exist as thallium carbonate or thallium chloride (RfD not available for elemental form).

RESULTS:

Using the preceding conversion factors and dose-response parameters, the following target concentrations may be developed for noncarcinogenic and carcinogenic effects based on target Hazard Quotients of 1.0 and target Lifetime Incremental Cancer Risks of 10^{-6} based on recreational land use.

COPC	Noncancer (mg/kg)	Cancer (mg/kg)	Minimum (mg/kg)
Benz(a)anthracene	NA	17	17
Benzo(a)pyrene	NA	1.7	1.7
Benzo(b)fluoranthene	NA	17	17
Polychlorinated biphenyls	NA	1.6	1.6
Trichloroethene	7600	1100	1100
cis-1,2-Dichloroethene	13000	NA	13000
Carbon tetrachloride	880	97	97
Thallium	100	NA	100

GROUNDWATER PROTECTION CONCENTRATIONS - WARMINSTER

OBJECTIVE:

Develop risk-based target concentrations for soil removal at the Naval Surface Warfare Center Warminster based on protection of groundwater. Apply the procedures outlined in the USEPA's Soil Screening Guidance: User's Guide and the associated Technical Background Document for Soil Screening Guidance.

ASSUMPTIONS:

- The partitioning equation and the mass limiting equation contained in the SSL document are suitable for modeling conditions at the site.
- Default parameters for soil bulk density, air-filled porosity, water-filled porosity, fractional organic carbon content, soil particle density, and exposure duration are appropriate and applicable to site conditions.
- Dimensionless Henry's Law Constants and Organic Carbon Partition Coefficient presented in the Technical Background document are appropriate for the specific chemicals of potential concern.
- The aquifer at the site could be a potential drinking water source. Hence target groundwater concentrations conform to Federal Maximum Contaminant Levels (MCL's).
- The recharge rate of 0.59 feet/year provided in the Technical Background document for Climatic Region VIII is representative of conditions at the site (Table 2-4, converted from meters to feet).
- The soil reaction at the site is neutral and the distribution coefficient for thallium can be determined from Figure 3-4 with pH = 7.0.

In addition, the default dilution/attenuation factor of 20 is considered appropriate given the following: 1) groundwater sampling at the site has not demonstrated the existence of any contamination; 2) the majority of the chemicals to be modeled are highly sorptive in nature (i.e, polycyclic aromatics and Aroclor 1248), trichloroethene is the only relatively nonsorptive chemical; 3) the site is approximately 0.5 acres in size.

RELEVANT EQUATIONS:

The equation for partitioning to groundwater (Equation 10 in the SSL guidance) is follows:

$$SSL = DAF \ x \ C_w \ x \left[K_d + (\theta_w - \theta_a H') / \rho_b \right]$$

Where:

SSL is the Soil Screening Level based on groundwater protection (mg/kg)
DAF is the default dilution/attenuation factor (2)
C_w is the target groundwater concentration (mg/L)
K_d is the distribution coefficient (L/kg)
θ_w is the water-filled soil porosity (L/L)
θ_a is the air-filled soil porosity (L/L)
H' is the dimensionless Henry's Law Constant
ρ_b is the dry soil bulk density (kg/L)

The mass limit equation for protection of groundwater (Equation 14 in the SSL guidance) is as follows:

$$SSL = DAF \ x \ C_w \ x \frac{I \ x \ ED}{\rho_b \ x \ d_s}$$

Where:

SSL is the mass limit Soil Screening Level for groundwater protection (mg/kg)
I is the rainwater/snowmelt infiltration rate (ft/yr)
ED is the exposure duration (years)
d_s is the depth of the source

DEFAULT PARAMETERS:

Default parameters for the simulation effort are as follows:

Parameter	Description	Value
F_{oc}	Fractional Organic Carbon Content	0.002
θ_w	Water-filled Soil Porosity	0.3
θ_a	Air-filled Soil Porosity	0.134
ρ_b	Dry Soil Bulk Density	1.5
DAF	Dilution/Attenuation Factor	20
ED	Exposure Duration	70
I	Infiltration Rate	0.59
$n^{(1)}$	Soil Particle Density	2.65

1 Used to determine air-filled soil porosity based on water-filled soil porosity.

SITE-SPECIFIC PARAMETERS:

Only one site-specific parameter will be used for the simulation effort. The depth of the source is set as six feet.

CHEMICAL-SPECIFIC PARAMETERS:

Six chemicals of potential concern (COPC) have been identified for the site. Henry's Law Constants and Organic Carbon Partition Coefficients for these chemicals are as follows:

COPC	H' (Dimensionless)(1)	K_{oc} (L/kg)(1)
Benz(a)anthracene	1.50E-04	3.57E+05
Benzo(a)pyrene	3.40E-05	9.16E+05
Benzo(b)fluoranthene	2.50E-04	9.16E+05
PCBs	1.50E-01	2.77E+05
Trichloroethene	4.30E-01	9.40E+01
cis-1,2-Dichloroethene	1.85E-01	2.90E+01
Carbon tetrachloride	1.18E+00	1.64E+02
Thallium(2)	0.00E-00	1.00E+01

1 - Source: Technical Background Document for Soil Screening Guidance (EPA/540/R-94/106).
2 - The distribution coefficient (K_d) is provided for Thallium.

RESULTS:

Using Equations 10 and 14, the following SSLs were developed for groundwater protection, as shown in the attached spreadsheet. As per the SSL guidance document, the maximum value is used as the groundwater protection SSL.

COPC	Equation 10 (mg/kg)	Equation 14 (mg/kg)	Maximum (mg/kg)
Benz(a)anthracene	1.43E+00	9.18E-03	1.43E+00
Benzo(a)pyrene	7.33E+00	1.84E-02	7.33E+00
Benzo(b)fluoranthene	7.06E+00	1.84E-02	7.06E+00
PCBs	5.54E+00	4.59E-02	5.54E+00
Trichloroethene	4.26E-02	4.59E-01	4.59E-01
cis-1,2-Dichloroethene	3.84E-01	6.42E+00	6.42E+00
Carbon tetrachloride	6.33E-02	4.59E-01	4.59E-01
Thallium	2.41E+00	1.84E-01	2.41E+00

GROUNDWATER PROTECTION CRITERIA FOR SOILS

REFERENCE: SOIL SCREENING GUIDANCE: USER'S GUIDE.
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE
WASHINGTON D.C. PUBLICATION 9355.4-23. APRIL 1996.

DEFAULT PARAMETERS:

Fractional Organic Carbon Content:	0.002
Water-filled Soil Porosity:	0.3
Dry Soil Bulk Density:	1.5
Soil Particle Density:	2.65
Soil Porosity:	0.433962264
Air-filled Soil Porosity:	0.133962264
Dilution/Attenuation Factor:	20
Exposure Duration	70

SITE-SPECIFIC PARAMETERS:

Infiltration Rate:	0.59	feet/year
Source Depth:	6	feet

CHEMICAL-SPECIFIC CALCULATIONS:

Chemical:	Koc (mg/kg/mg/L)	Kd (mg/kg/mg/L)	H' (dimensionless)	Cw (mg/L)	SSLs (mg/kg) Equation 10	SSLs (mg/kg) Equation 14	Maximum SSL (mg/kg)
Benzo(a)anthracene	3.57E+05	7.14E+02	1.50E-04	1.00E-04	1.43E+00	9.18E-03	1.43E+00
Benzo(a)pyrene	9.16E+05	1.83E+03	3.40E-05	2.00E-04	7.33E+00	1.84E-02	7.33E+00
Benzo(b)fluoranthene	8.83E+05	1.77E+03	2.50E-04	2.00E-04	7.06E+00	1.84E-02	7.06E+00
PCBs	2.77E+05	5.54E+02	1.50E-01	5.00E-04	5.54E+00	4.59E-02	5.54E+00
Trichloroethene	9.40E+01	1.88E-01	4.30E-01	5.00E-03	4.26E-02	4.59E-01	4.59E-01
cis-1,2-Dichloroethene	2.90E+01	5.80E-02	1.85E-01	7.00E-02	3.84E-01	6.42E+00	6.42E+00
Carbon tetrachloride	1.64E+02	3.28E-01	1.18E+00	5.00E-03	6.33E-02	4.59E-01	4.59E-01
Thallium	NA	6.00E+01	0.00E+00	2.00E-03	2.41E+00	1.84E-01	2.41E+00

PROJECTED RISKS BASED ON PRELIMINARY TARGET CONCENTRATIONS
GOALS FOR RECREATIONAL AND RESIDENTIAL LAND USE AND GROUNDWATER PROTECTION BASED ON 1E-6 CANCER RISK

Chemical	Target Conc. (mg/kg)	Goal (Recr) (mg/kg)	Cancer Risk	Goal (Resid) (mg/kg)	Cancer Risk	GW Conc. (mg/L)	GW Goal (mg/L)	Cancer Risk
Benzo(a)anthracene	1.40E+00	1.70E+01	8.24E-08	8.80E-01	1.59E-06	9.80E-05	9.20E-05	1.07E-06
Benzo(a)pyrene	6.00E-01	1.70E+00	3.53E-07	8.80E-02	6.82E-06	1.64E-05	9.20E-06	1.78E-06
Benzo(b)fluoranthene	6.00E+00	1.70E+01	3.53E-07	8.80E-01	6.82E-06	1.70E-04	9.20E-05	1.85E-06
PCBs	1.60E+00	1.60E+00	1.00E-06	8.30E-02	1.93E-05	1.44E-04	8.70E-06	1.66E-05
Trichloroethene	4.59E-01	1.10E+03	4.17E-10	5.80E+01	7.91E-09	5.00E-03	1.60E-03	3.13E-06
Carbon tetrachloride	4.59E-01	9.70E+01	4.73E-09	4.90E+00	9.37E-08	5.00E-03	1.60E-04	3.13E-05
			1.79E-06		3.46E-05			5.57E-05

ATTACHMENT B

SAMPLE SIZE CALCULATIONS

CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT NAVY	JOB NUMBER 1412
SUBJECT SAMPLING STRATEGY FOR VERIFYING SITE 4 CLEANUP	
BASED ON PADEP ACT 2; SITE 4 EE/CA REPORT	DRAWING NUMBER
BY N TEAMERSON / CHECKED BY KCK	APPROVED BY / DATE 22 MAY 96

OBJECTIVE

Determine a random sampling strategy to verify remediation of Site 4.

GIVEN

Eight trenches with the following dimensions:
(SD = surface depression as described in Site 4 EE/CA Report, HNUS, July 1995).

SD	LENGTH	DEPTH	WIDTH	2 SIDEWALLS	TOTAL AREA
Ø	420'	4'	12'	3360 SF	8400 SF
1	436'	4.5'	13.6'	3924 SF	9854 SF
2	472'	4'	10.5'	3776 SF	8732 SF
3	488'	5'	12.75'	4880 SF	11,102 SF
4	356'	5'	13.33'	3560 SF	8305 SF
5	290'	5'	12.75'	2900 SF	6598 SF
6	232'	6'	11.6'	2784 SF	5475 SF
7	148'	5'	12.13'	1480 SF	3275 SF
TOTAL	2,642'			26,664 SF	61,741 SF

NOTE: Total area = (Area of sidewalls) + (length × width)

CLIENT	JOB NUMBER
NAVY	1412

SUBJECT: SAMPLING STRATEGY FOR VERIFYING SITE 4 CLEANUP

BASED ON	DRAWING NUMBER
PADEP ACT 2; SITE 4 EE/CA REPORT	

BY	CHECKED BY	APPROVED BY	DATE
N. TEAMERSON	KCK		22 MAY 96

METHODOLOGY

Act 2 suggests that 1 sample per 45 feet of sidewall should be collected and provides tables to determine the minimum number of recommended excavation floor and sidewall samples. This guidance is applicable to small sites (less than 10,890 SF). Assume each trench is a small site.

	SIDEWALL AREA		FLOOR AREA		TOTAL
SD	SF	NO. OF SAMPLES	SF	NO. OF SAMPLES	SAMPLES
Ø	3360	9	5040	7	16
1	3924	9	5930	7	16
2	3776	9	4988	7	16
3	4880	11	6222	8	19
4	3560	9	4745	7	16
5	2900	8	3698	6	14
6	2784	8	2691	6	14
7	1480	6	1795	5	11
	26,664 SF	69	35,109 SF	53	122

CLIENT	JOB NUMBER
NAVY	1412

SUBJECT: SAMPLING STRATEGY FOR VERIFYING SITE 4 CLEANUP

BASED ON	DRAWING NUMBER
PADEP ACT 2; SITE 4 EE/CA REPORT	

BY	CHECKED BY	APPROVED BY	DATE
N. TEAMERSON	KCK		22 MAY 96

METHODOLOGY (continued)

A biased sampling approach is recommended, focusing on collecting samples from areas most likely to exceed established clean-up standards. For Site 4, these biases include

- Stained or discolored soils
- Presence of buried materials (e.g., construction debris)
- Organic vapor detector readings
- Changes in soil types
- Changes in soil characteristics (e.g., moisture content)
- Previously collected soil samples from Site 4
- Downgradient edge of excavated area (based on shallow groundwater flow direction)
- Results from nearby monitoring wells

A grid system will not be used. However, the spacing of the grid would be as follows:

SIDEWALLS

$$\frac{2842'}{69} = 41'$$

FLOOR AREA

$$\frac{2842'}{53} = 54'$$

Combined, the average spacing is about 50.'

SUMMARY

Collect 1 sidewall and 1 floor sample within each 50-foot interval of the trenches. Use a biased approach to select the samples to be collected within each interval.

CLIENT NAVY		JOB NUMBER 1412	
SUBJECT SAMPLING STRATEGY FOR VERIFYING SITE 4 CLEANUP			
BASED ON PADEP ACT 2; SITE 4 EE/CA REPORT		DRAWING NUMBER	
BY N TEAMERSON	CHECKED BY KCK	APPROVED BY	DATE 22 MAY 96

SUMMARY (continued)

The samples will be collected near one another; one from the sidewall and one from the floor area. Additional samples will be taken, based on the presence of potentially contaminated soils, within each 50-foot interval, as needed.

If no bias exists within a 50-foot interval, use a random number generator (or random number table) to select the distance within the interval where samples will be collected.

If excavation goes to bedrock for any trench, and a floor sample cannot be obtained, substitute an additional sidewall sample for that particular interval.

SD	NO. OF SAMPLES
Ø	18
1	18
2	18
3	20
4	14
5	12
6	10
7	6

TOTAL OF 116 SAMPLES

50% SIDEWALL
50% FLOOR

CLIENT	JOB NUMBER
NAVY	1412.2900
SUBJECT: Site 4 Sampling Plan	
BASED ON	DRAWING NUMBER

BY	CHECKED BY	APPROVED BY	DATE
JPO			

Statistical Determination of No. of Samples Required to Demonstrate Adequate Cleanup

Reference: Methods for Evaluating the Attainment of Cleanup Standards, Volume I: Soils and Solid Media. EPA/230/02-89.042, 1989.

From Section 6.3.2, Box 6.3

$$n_d = \frac{(Z_{1-\beta} + Z_{1-\alpha})^2}{\tau^2}, \text{ where } \tau = \frac{(C_s - \mu_1)}{\hat{\sigma}}$$

n_d = No of samples required

C_s = Cleanup standard (From Table 4 of the Sampling Plan)

μ = mean concentration where site should be declared clean w/ high probability (assume $.8 \times C_s$)

α = false positive rate (5%)

β = false negative rate (20%)

$Z_{1-\alpha}$ & $Z_{1-\beta}$ obtained from Table A.2:

$Z_{1-\alpha} = 1.645$

$Z_{1-\beta} = 0.842$

$\hat{\sigma}$ = standard deviation - Approximated as the range ÷ 6 where the range = the spread between the highest & lowest values

For the Target Compounds, $\hat{\sigma}$ =

Compound	Range*	$\hat{\sigma}$ (R/6)
Benz(a)anthracene	0-1.1, 1.1	.18
Benzo(a)pyrene	0-1.005, 1.0	.17
Benzo(b)fluoranthene	0-1.5, 1.5	.25
PCB's	0-3.5, 3.5	.58
Trichloroethene	0-.025, .025	.004

CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT	JOB NUMBER
Navy	1412.2900

SUBJECT: Site 4 Sampling Plan

BASED ON	DRAWING NUMBER

BY	CHECKED BY	APPROVED BY	DATE
JPO			

Compound	Range*	$\hat{\sigma}$ (R/6)
cis-1,2-DCE	ND	NA
Carbon tetrachloride	ND	NA
Thallium	ND	NA

*- Range taken from Site 4 EE/CA results for subsurface soils, or from surface soils if not detected in subsurface soils.

For those compounds w/ positive detections, the NO's of samples statistically required to demonstrate clean are:

Compound	C_s (mg/L)	$\hat{\sigma}$	μ (mg/L)	τ	n_d
Benz(a)anthracene	1.04	.18	1.1	1.67	2.2
Benz(a)pyrene	0.6	.17	.48	.70	12.6
Benzo(b)fluoranthene	6.0	.25	4.8	4.8	.3
PCB's	1.6	.58	1.3	.51	24
Trichloroethene	0.46	.004	.37	22.5	.01

Maximum number of samples required = 24

ATTACHMENT B

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-00	W-TR00-08	W-TR00-00-AVG	W-TR00-01	W-TR00-02	W-TR00-03	W-TR00-04
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:		W-TR00-00					
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE							10 U
2-CHLOROETHYL VINYL ETHER	10 UR	10 UR	5 R	10 U	10 U	10 U	
2-HEXANONE							10 U
4-METHYL-2-PENTANONE							10 U
ACETONE							10 UJ
BENZENE							5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE							5 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE							5 U
METHYLENE CHLORIDE	5 U	5 U	5 U	3 B	3 B	3 B	2 B
STYRENE							5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-00	W-TR00-08	W-TR00-00-AVG	W-TR00-01	W-TR00-02	W-TR00-03	W-TR00-04
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:		W-TR00-00					
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE							5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	
VINYL ACETATE							10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL							15 U
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE							330 U
1,2-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	330 U
1,3-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	330 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	330 U
2,4,5-TRICHLOROPHENOL							800 U
2,4,6-TRICHLOROPHENOL							330 U
2,4-DICHLOROPHENOL							330 U
2,4-DIMETHYLPHENOL							330 U
2,4-DINITROPHENOL							1600 U
2-CHLORONAPHTHALENE							330 U
2-CHLOROPHENOL							330 U
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL							330 U
2-NITROANILINE							1600 U
2-NITROPHENOL							330 U
3,3'-DICHLOROBENZIDINE							660 U
3-NITROANILINE							1600 U
4,6-DINITRO-2-METHYLPHENOL							1600 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-00	W-TR00-08	W-TR00-00-AVG	W-TR00-01	W-TR00-02	W-TR00-03	W-TR00-04
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:		W-TR00-00					
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER							330 U
4-CHLORO-3-METHYLPHENOL							330 U
4-CHLOROANILINE							330 U
4-CHLOROPHENYL PHENYL ETHER							330 U
4-METHYLPHENOL							330 U
4-NITROANILINE							1600 U
4-NITROPHENOL							1600 U
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZOIC ACID							1600 U
BENZYL ALCOHOL							330 U
BIS(2-CHLOROETHOXY)METHANE							330 U
BIS(2-CHLOROETHYL)ETHER							330 U
BIS(2-CHLOROISOPROPYL) ETHER							330 U
BIS(2-ETHYLHEXYL)PHTHALATE							330 U
BUTYLBENZYL PHTHALATE							330 U
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE							330 U
DI-N-OCTYL PHTHALATE							330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZOFURAN							330 U
DIETHYL PHTHALATE							330 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-00	W-TR00-08	W-TR00-00-AVG	W-TR00-01	W-TR00-02	W-TR00-03	W-TR00-04
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:		W-TR00-00					
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE							330 U
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE							330 U
HEXACHLOROBUTADIENE							330 U
HEXACHLOROCYCLOPENTADIENE							330 U
HEXACHLOROETHANE							330 U
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ISOPHORONE							330 U
N-NITROSO-DI-N-PROPYLAMINE							330 U
N-NITROSODIPHENYLAMINE							330 U
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL							1600 U
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENOL							330 U
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD							16.0 U
4,4'-DDE							16.0 U
4,4'-DDT							16.0 U
ALDRIN							8.0 U
ALPHA-BHC							8.0 U
AROCLOR-1016	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1221	80 U	80 U	80 U	80 U	80 U	80 U	80.0 U
AROCLOR-1232	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1242	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1248	40 U	40 U	40 U	140	40 U	40 U	40.0 U
AROCLOR-1254	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-00	W-TR00-08	W-TR00-00-AVG	W-TR00-01	W-TR00-02	W-TR00-03	W-TR00-04
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:		W-TR00-00					
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
BETA-BHC							8.0 U
CHLORDANE							80.0 U
DELTA-BHC							8.0 U
DIELDRIN							16.0 U
ENDOSULFAN I							16.0 U
ENDOSULFAN II							16.0 U
ENDOSULFAN SULFATE							16.0 U
ENDRIN							16.0 U
ENDRIN ALDEHYDE							32.0 U
GAMMA-BHC (LINDANE)							8.0 U
HEPTACHLOR							8.0 U
HEPTACHLOR EPOXIDE							8.0 U
METHOXYCHLOR							80.0 U
TOXAPHENE							160 U
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE							330 U
2,6-DINITROTOLUENE							330 U
NITROBENZENE							330 U
METALS (mg/kg)							
ALUMINUM							9560
ANTIMONY							0.65 UJ
ARSENIC							2.3 L
BARIUM							85.9
BERYLLIUM							0.84
CADMIUM							0.03 UL
CALCIUM							1000
CHROMIUM							14.0

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-00	W-TR00-08	W-TR00-00-AVG	W-TR00-01	W-TR00-02	W-TR00-03	W-TR00-04
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:		W-TR00-00					
METALS (mg/kg)							
COBALT							7.1
COPPER							14.2 L
IRON							13600
LEAD							6.5 K
MAGNESIUM							1450
MANGANESE							534 J
MERCURY							0.04 U
NICKEL							9.1
POTASSIUM							534 K
SELENIUM							1.3 J
SILVER							0.29 UL
SODIUM							139 K
THALLIUM	0.79 J	0.74 J	0.77 J	2.1 J	1.2 J	1.2 J	1.2 J
VANADIUM							24.2
ZINC							23.0 J

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-05	W-TR00-06	W-TR00-07	W-TR00-09	W-TR00-10	W-TR00-11	W-TR00-12
SAMPLE DATE:	09/12/96	09/12/96	09/12/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							Excavated
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE	10 U						
2-CHLOROETHYL VINYL ETHER		10 U	10 U	10 UR	10 UR	10 UR	10 UR
2-HEXANONE	10 U						
4-METHYL-2-PENTANONE	10 U						
ACETONE	10 UJ						
BENZENE	5 U						
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE	5 U						
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	5 U						
METHYLENE CHLORIDE	3 B	3 B	4 B	5 U	5 U	5 U	5 U
STYRENE	5 U						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-05	W-TR00-06	W-TR00-07	W-TR00-09	W-TR00-10	W-TR00-11	W-TR00-12
SAMPLE DATE:	09/12/96	09/12/96	09/12/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							Excavated
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	5 U						
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE		5 U	5 U	5 U	5 U	5 U	5 U
VINYL ACETATE	10 U						
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL	15 U						
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE	330 U						
1,2-DICHLOROBENZENE	330 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	330 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	330 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL	800 U						
2,4,6-TRICHLOROPHENOL	330 U						
2,4-DICHLOROPHENOL	330 U						
2,4-DIMETHYLPHENOL	330 U						
2,4-DINITROPHENOL	1600 U						
2-CHLORONAPHTHALENE	330 U						
2-CHLOROPHENOL	330 U						
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL	330 U						
2-NITROANILINE	1600 U						
2-NITROPHENOL	330 U						
3,3'-DICHLOROBENZIDINE	660 U						
3-NITROANILINE	1600 U						
4,6-DINITRO-2-METHYLPHENOL	1600 U						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-05	W-TR00-06	W-TR00-07	W-TR00-09	W-TR00-10	W-TR00-11	W-TR00-12
SAMPLE DATE:	09/12/96	09/12/96	09/12/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							Excavated
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER	330 U						
4-CHLORO-3-METHYLPHENOL	330 U						
4-CHLOROANILINE	330 U						
4-CHLOROPHENYL PHENYL ETHER	330 U						
4-METHYLPHENOL	330 U						
4-NITROANILINE	1600 U						
4-NITROPHENOL	1600 U						
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	180 J
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	150 J
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	22 J	330 U	200 J
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	77 J
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	100 J
BENZOIC ACID	1600 U						
BENZYL ALCOHOL	330 U						
BIS(2-CHLOROETHOXY)METHANE	330 U						
BIS(2-CHLOROETHYL)ETHER	330 U						
BIS(2-CHLOROISOPROPYL) ETHER	330 U						
BIS(2-ETHYLHEXYL)PHTHALATE	330 U						
BUTYLBENZYL PHTHALATE	330 U						
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	200 J
DI-N-BUTYL PHTHALATE	330 U						
DI-N-OCTYL PHTHALATE	330 U						
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	18 J
DIBENZOFURAN	330 U						
DIETHYL PHTHALATE	330 U						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-05	W-TR00-06	W-TR00-07	W-TR00-09	W-TR00-10	W-TR00-11	W-TR00-12
SAMPLE DATE:	09/12/96	09/12/96	09/12/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							Excavated
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE	330 U						
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	420
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE	330 U						
HEXACHLOROBUTADIENE	330 U						
HEXACHLOROCYCLOPENTADIENE	330 U						
HEXACHLOROETHANE	330 U						
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	87 J
ISOPHORONE	330 U						
N-NITROSO-DI-N-PROPYLAMINE	330 U						
N-NITROSODIPHENYLAMINE	330 U						
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL	1600 U						
PHENANTHRENE	330 U	330 U	330 U	330 U	20 J	330 U	250 J
PHENOL	330 U						
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD	16.0 U						
4,4'-DDE	16.0 U						
4,4'-DDT	16.0 U						
ALDRIN	8.0 U						
ALPHA-BHC	8.0 U						
AROCLOR-1016	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1221	80.0 U	80 U	80 U	80 U	80 U	80 U	80 U
AROCLOR-1232	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1242	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1248	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1254	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-05	W-TR00-06	W-TR00-07	W-TR00-09	W-TR00-10	W-TR00-11	W-TR00-12
SAMPLE DATE:	09/12/96	09/12/96	09/12/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							Excavated
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
BETA-BHC	8.0 U						
CHLORDANE	80.0 U						
DELTA-BHC	8.0 U						
DIELDRIN	16.0 U						
ENDOSULFAN I	16.0 U						
ENDOSULFAN II	16.0 U						
ENDOSULFAN SULFATE	16.0 U						
ENDRIN	16.0 U						
ENDRIN ALDEHYDE	32.0 U						
GAMMA-BHC (LINDANE)	8.0 U						
HEPTACHLOR	8.0 U						
HEPTACHLOR EPOXIDE	8.0 U						
METHOXYCHLOR	80.0 U						
TOXAPHENE	160 U						
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE	330 U						
2,6-DINITROTOLUENE	330 U						
NITROBENZENE	330 U						
METALS (mg/kg)							
ALUMINUM	10800						
ANTIMONY	1.2 J						
ARSENIC	2.1 L						
BARIUM	62.8						
BERYLLIUM	0.68						
CADMIUM	0.03 UL						
CALCIUM	576 K						
CHROMIUM	12.5						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-05	W-TR00-06	W-TR00-07	W-TR00-09	W-TR00-10	W-TR00-11	W-TR00-12
SAMPLE DATE:	09/12/96	09/12/96	09/12/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							Excavated
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT	29.1						
COPPER	18.5 L						
IRON	16400						
LEAD	7.9 K						
MAGNESIUM	1360						
MANGANESE	1340 J						
MERCURY	0.04 U						
NICKEL	8.7						
POTASSIUM	507 K						
SELENIUM	1.7 J						
SILVER	0.29 UL						
SODIUM	165 K						
THALLIUM	1.8 J	1.1 J	0.97 J	1.0 J	1.3 J	1.4 J	0.70 J
VANADIUM	23.5						
ZINC	20.2 J						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-13	W-TR00-14	W-TR00-15	W-TR00-16	W-TR00-17	W-TR00-18	W-TR00-18R
SAMPLE DATE:	10/03/96	10/30/96	10/30/96	10/30/96	10/30/96	10/30/96	11/20/96
STATUS:	Excavated					Excavated	
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	
2-BUTANONE		10 U				10 U	
2-CHLOROETHYL VINYL ETHER	10 UR		10 UJ	10 UJ	10 UJ		
2-HEXANONE		10 U				10 U	
4-METHYL-2-PENTANONE		10 U				10 U	
ACETONE		10 U				10 U	
BENZENE		5 U				5 U	
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	
CARBON DISULFIDE		5 U				5 U	
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	
ETHYLBENZENE		5 U				5 U	
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	
STYRENE		5 U				5 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-13	W-TR00-14	W-TR00-15	W-TR00-16	W-TR00-17	W-TR00-18	W-TR00-18R
SAMPLE DATE:	10/03/96	10/30/96	10/30/96	10/30/96	10/30/96	10/30/96	11/20/96
STATUS:	Excavated					Excavated	
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	
TOLUENE		5 U				5 U	
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	
TRICHLOROFLUOROMETHANE	5 U		5 U	5 U	5 U		
VINYL ACETATE		10 U				10 U	
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	
XYLENES, TOTAL		15 U				15 U	
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE		330 U				330 U	
1,2-DICHLOROBENZENE	5 U	330 U	5 U	5 U	5 U	330 U	
1,3-DICHLOROBENZENE	5 U	330 U	5 U	5 U	5 U	330 U	
1,4-DICHLOROBENZENE	5 U	330 U	5 U	5 U	5 U	330 U	
2,4,5-TRICHLOROPHENOL		800 U				800 U	
2,4,6-TRICHLOROPHENOL		330 U				330 U	
2,4-DICHLOROPHENOL		330 U				330 U	
2,4-DIMETHYLPHENOL		330 U				330 U	
2,4-DINITROPHENOL		1600 UJ				1600 UJ	
2-CHLORONAPHTHALENE		330 U				330 U	
2-CHLOROPHENOL		330 U				330 U	
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	
2-METHYLPHENOL		330 U				330 U	
2-NITROANILINE		1600 U				1600 U	
2-NITROPHENOL		330 U				330 U	
3,3'-DICHLOROBENZIDINE		660 U				660 U	
3-NITROANILINE		1600 U				1600 U	
4,6-DINITRO-2-METHYLPHENOL		1600 U				1600 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-13	W-TR00-14	W-TR00-15	W-TR00-16	W-TR00-17	W-TR00-18	W-TR00-18R
SAMPLE DATE:	10/03/96	10/30/96	10/30/96	10/30/96	10/30/96	10/30/96	11/20/96
STATUS:	Excavated					Excavated	
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER		330 U				330 U	
4-CHLORO-3-METHYLPHENOL		330 U				330 U	
4-CHLOROANILINE		330 U				330 U	
4-CHLOROPHENYL PHENYL ETHER		330 U				330 U	
4-METHYLPHENOL		330 U				330 U	
4-NITROANILINE		1600 U				1600 U	
4-NITROPHENOL		1600 U				1600 U	
ACENAPHTHENE	84 J	330 U	330 U	49 J	330 U	330 U	
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	
ANTHRACENE	160 J	330 U	330 U	90 J	330 U	330 U	
BENZO(A)ANTHRACENE	650	100 J	330 U	480	330 U	140 J	
BENZO(A)PYRENE	780	69 J	330 U	420	330 U	170 J	
BENZO(B)FLUORANTHENE	1200	96 J	330 U	480	330 U	190 J	
BENZO(G,H,I)PERYLENE	350	34 J	330 U	280 J	330 U	120 J	
BENZO(K)FLUORANTHENE	600	36 J	330 U	210 J	330 U	81 J	
BENZOIC ACID		1600 U				1600 U	
BENZYL ALCOHOL		330 U				330 U	
BIS(2-CHLOROETHOXY)METHANE		330 U				330 U	
BIS(2-CHLOROETHYL)ETHER		330 U				330 U	
BIS(2-CHLOROISOPROPYL) ETHER		330 U				330 U	
BIS(2-ETHYLHEXYL)PHTHALATE		1200				2600	
BUTYLBENZYL PHTHALATE		330 U				330 U	
CHRYSENE	1100	130 J	330 U	480	330 U	170 J	
DI-N-BUTYL PHTHALATE		330 U				330 U	
DI-N-OCTYL PHTHALATE		330 U				330 U	
DIBENZO(A,H)ANTHRACENE	75 J	330 U	330 U	69 J	330 U	330 U	
DIBENZOFURAN		330 U				330 U	
DIETHYL PHTHALATE		330 U				330 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-13	W-TR00-14	W-TR00-15	W-TR00-16	W-TR00-17	W-TR00-18	W-TR00-18R
SAMPLE DATE:	10/03/96	10/30/96	10/30/96	10/30/96	10/30/96	10/30/96	11/20/96
STATUS:	Excavated					Excavated	
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE		330 U				330 U	
FLUORANTHENE	2700	160 J	330 U	660	330 U	200 J	
FLUORENE	130 J	330 U	330 U	330 U	330 U	330 U	
HEXACHLOROBENZENE		330 U				330 U	
HEXACHLOROBUTADIENE		330 U				330 U	
HEXACHLOROCYCLOPENTADIENE		330 U				330 U	
HEXACHLOROETHANE		330 U				330 U	
INDENO(1,2,3-CD)PYRENE	430	29 J	330 U	260 J	330 U	130 J	
ISOPHORONE		330 U				330 U	
N-NITROSO-DI-N-PROPYLAMINE		330 U				330 U	
N-NITROSODIPHENYLAMINE		330 U				330 U	
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	
PENTACHLOROPHENOL		1600 U				1600 U	
PHENANTHRENE	2600	120 J	330 U	400	330 U	73 J	
PHENOL		330 U				330 U	
PYRENE	2200	130 J	330 U	610	330 U	240 J	
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD		16.0 U				16.0 U	
4,4'-DDE		16.0 U				16.0 U	
4,4'-DDT		16.0 U				16.0 U	
ALDRIN		8.0 U				8.0 U	
ALPHA-BHC		8.0 U				8.0 U	
AROCLOR-1016	40 U	40.0 U	40 U	40 U	40 U	40.0 U	
AROCLOR-1221	80 U	80.0 U	80 U	80 U	80 U	80.0 U	
AROCLOR-1232	40 U	40.0 U	40 U	40 U	40 U	40.0 U	
AROCLOR-1242	40 U	40.0 U	40 U	40 U	40 U	40.0 U	
AROCLOR-1248	40 U	40.0 U	40 U	40 U	40 U	40.0 U	
AROCLOR-1254	40 U	40.0 U	40 U	40 U	40 U	40.0 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-13	W-TR00-14	W-TR00-15	W-TR00-16	W-TR00-17	W-TR00-18	W-TR00-18R
SAMPLE DATE:	10/03/96	10/30/96	10/30/96	10/30/96	10/30/96	10/30/96	11/20/96
STATUS:	Excavated					Excavated	
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40.0 U	40 U	40 U	40 U	40.0 U	
BETA-BHC		8.0 U				8.0 U	
CHLORDANE		80.0 U				80.0 U	
DELTA-BHC		8.0 U				8.0 U	
DIELDRIN		16.0 U				16.0 U	
ENDOSULFAN I		16.0 U				16.0 U	
ENDOSULFAN II		16.0 U				16.0 U	
ENDOSULFAN SULFATE		16.0 U				16.0 U	
ENDRIN		16.0 U				16.0 U	
ENDRIN ALDEHYDE		32.0 U				32.0 U	
GAMMA-BHC (LINDANE)		8.0 U				8.0 U	
HEPTACHLOR		8.0 U				8.0 U	
HEPTACHLOR EPOXIDE		8.0 U				8.0 U	
METHOXYCHLOR		80.0 U				2.7 J	
TOXAPHENE		160 U				160 U	
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE		330 U				330 U	
2,6-DINITROTOLUENE		330 U				330 U	
NITROBENZENE		330 U				330 U	
METALS (mg/kg)							
ALUMINUM		8790				19700	12500
ANTIMONY		0.65 U				0.66 U	
ARSENIC		2.3 B				6.0 K	
BARIUM		41.8				62.9	
BERYLLIUM		0.60 J				0.97 J	
CADMIUM		0.03 U				0.03 UL	
CALCIUM		1400				2050	
CHROMIUM		9.1				21.9	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR00-13	W-TR00-14	W-TR00-15	W-TR00-16	W-TR00-17	W-TR00-18	W-TR00-18R
SAMPLE DATE:	10/03/96	10/30/96	10/30/96	10/30/96	10/30/96	10/30/96	11/20/96
STATUS:	Excavated					Excavated	
TRENCH:	0	0	0	0	0	0	0
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT		6.2				10.6	
COPPER		56.5				5.9	
IRON		7890				23000	
LEAD		3.9				12.0	
MAGNESIUM		2200				4160	
MANGANESE		261 K				480 K	
MERCURY		0.04 U				0.04 U	
NICKEL		8.5				15.9	
POTASSIUM		394				2250	
SELENIUM		1.1				1.9	
SILVER		0.28 UL				0.29 UL	
SODIUM		484 B				410 B	
THALLIUM	1.6 J	1.2 B	0.69 B	1.8 B	2.5 B	2.3 B	
VANADIUM		11.5				30.4	
ZINC		14.3				35.5	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-00	W-TR01-08	W-TR01-00-AVG	W-TR01-01	W-TR01-02	W-TR01-03	W-TR01-04
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:		W-TR01-00					
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE							10 U
2-CHLOROETHYL VINYL ETHER	10 U	10 U	10 U	10 U	10 U	10 U	
2-HEXANONE							10 U
4-METHYL-2-PENTANONE							10 U
ACETONE							10 U
BENZENE							5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE							5 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	2 B	2 B	2 B	2 B	2 B	2 B	2 B
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE							5 U
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
STYRENE							5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-00	W-TR01-08	W-TR01-00-AVG	W-TR01-01	W-TR01-02	W-TR01-03	W-TR01-04
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:		W-TR01-00					
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE							5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	
VINYL ACETATE							10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL							15 U
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE							330 UJ
1,2-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	330 UJ
1,3-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	330 UJ
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	330 UJ
2,4,5-TRICHLOROPHENOL							800 UJ
2,4,6-TRICHLOROPHENOL							330 UJ
2,4-DICHLOROPHENOL							330 UJ
2,4-DIMETHYLPHENOL							330 UJ
2,4-DINITROPHENOL							1600 UJ
2-CHLORONAPHTHALENE							330 UJ
2-CHLOROPHENOL							330 UJ
2-METHYLNAPHTHALENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
2-METHYLPHENOL							330 UJ
2-NITROANILINE							1600 UJ
2-NITROPHENOL							330 UJ
3,3'-DICHLOROBENZIDINE							660 UJ
3-NITROANILINE							1600 UJ
4,6-DINITRO-2-METHYLPHENOL							1600 UJ

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-00	W-TR01-08	W-TR01-00-AVG	W-TR01-01	W-TR01-02	W-TR01-03	W-TR01-04
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:		W-TR01-00					
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER							330 UJ
4-CHLORO-3-METHYLPHENOL							330 UJ
4-CHLOROANILINE							330 UJ
4-CHLOROPHENYL PHENYL ETHER							330 UJ
4-METHYLPHENOL							330 UJ
4-NITROANILINE							1600 UJ
4-NITROPHENOL							1600 UJ
ACENAPHTHENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
ACENAPHTHYLENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
ANTHRACENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
BENZO(A)ANTHRACENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
BENZO(A)PYRENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
BENZO(B)FLUORANTHENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
BENZO(G,H,I)PERYLENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
BENZO(K)FLUORANTHENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
BENZOIC ACID							1600 UJ
BENZYL ALCOHOL							330 UJ
BIS(2-CHLOROETHOXY)METHANE							330 UJ
BIS(2-CHLOROETHYL)ETHER							330 UJ
BIS(2-CHLOROISOPROPYL) ETHER							330 UJ
BIS(2-ETHYLHEXYL)PHTHALATE							330 UJ
BUTYLBENZYL PHTHALATE							330 UJ
CHRYSENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
DI-N-BUTYL PHTHALATE							330 UJ
DI-N-OCTYL PHTHALATE							330 UJ
DIBENZO(A,H)ANTHRACENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
DIBENZOFURAN							330 UJ
DIETHYL PHTHALATE							330 UJ

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-00	W-TR01-08	W-TR01-00-AVG	W-TR01-01	W-TR01-02	W-TR01-03	W-TR01-04
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:		W-TR01-00					
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE							330 UJ
FLUORANTHENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
FLUORENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
HEXACHLOROBENZENE							330 UJ
HEXACHLOROBUTADIENE							330 UJ
HEXACHLOROCYCLOPENTADIENE							330 UJ
HEXACHLOROETHANE							330 UJ
INDENO(1,2,3-CD)PYRENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
ISOPHORONE							330 UJ
N-NITROSO-DI-N-PROPYLAMINE							330 UJ
N-NITROSODIPHENYLAMINE							330 UJ
NAPHTHALENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
PENTACHLOROPHENOL							1600 UJ
PHENANTHRENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
PHENOL							330 UJ
PYRENE	330 UJ	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD							16.0 U
4,4'-DDE							16.0 U
4,4'-DDT							16.0 U
ALDRIN							8.0 U
ALPHA-BHC							8.0 U
AROCLOR-1016	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1221	80 U	80 U	80 U	80 U	80 U	80 U	80.0 U
AROCLOR-1232	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1242	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1248	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1254	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-00	W-TR01-08	W-TR01-00-AVG	W-TR01-01	W-TR01-02	W-TR01-03	W-TR01-04
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:		W-TR01-00					
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
BETA-BHC							8.0 U
CHLORDANE							80.0 U
DELTA-BHC							8.0 U
DIELDRIN							16.0 U
ENDOSULFAN I							16.0 U
ENDOSULFAN II							16.0 U
ENDOSULFAN SULFATE							16.0 U
ENDRIN							16.0 U
ENDRIN ALDEHYDE							32.0 U
GAMMA-BHC (LINDANE)							8.0 U
HEPTACHLOR							8.0 U
HEPTACHLOR EPOXIDE							8.0 U
METHOXYCHLOR							80.0 U
TOXAPHENE							160 U
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE							330 UJ
2,6-DINITROTOLUENE							330 UJ
NITROBENZENE							330 UJ
METALS (mg/kg)							
ALUMINUM							6570 L
ANTIMONY							0.69 J
ARSENIC							1.0 J
BARIUM							111 L
BERYLLIUM							0.78
CADMIUM							0.03 UL
CALCIUM							2100
CHROMIUM							16.0

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-00	W-TR01-08	W-TR01-00-AVG	W-TR01-01	W-TR01-02	W-TR01-03	W-TR01-04
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96	08/29/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:		W-TR01-00					
METALS (mg/kg)							
COBALT							11.3
COPPER							134
IRON							15700
LEAD							4.6 J
MAGNESIUM							2110
MANGANESE							403 L
MERCURY							0.04 U
NICKEL							17.4
POTASSIUM							255 K
SELENIUM							1.3 K
SILVER							0.31 UL
SODIUM							191
THALLIUM	0.93 J	1.3 J	1.12 J	0.44 UJ	1.2 J	1.2 J	0.99 J
VANADIUM							24.7
ZINC							19.9

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-05	W-TR01-06	W-TR01-07	W-TR01-09	W-TR01-10	W-TR01-11	W-TR01-12
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	09/05/96	09/05/96	09/05/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE	10 U						
2-CHLOROETHYL VINYL ETHER		10 U	10 U	10 U	10 U	10 U	10 U
2-HEXANONE	10 U						
4-METHYL-2-PENTANONE	10 U						
ACETONE	10 U						
BENZENE	5 U						
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE	5 U						
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	2 B	2 B	2 B	2 B	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	5 U						
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	4 B	4 B	4 B
STYRENE	5 U						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-05	W-TR01-06	W-TR01-07	W-TR01-09	W-TR01-10	W-TR01-11	W-TR01-12
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	09/05/96	09/05/96	09/05/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	5 U						
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE		5 U	5 U	5 U	5 U	5 U	5 U
VINYL ACETATE	10 U						
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL	15 U						
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE	330 UJ						
1,2-DICHLOROBENZENE	330 UJ	5 U	5 U	5 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	330 UJ	5 U	5 U	5 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	330 UJ	5 U	5 U	5 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL	800 UJ						
2,4,6-TRICHLOROPHENOL	330 UJ						
2,4-DICHLOROPHENOL	330 UJ						
2,4-DIMETHYLPHENOL	330 UJ						
2,4-DINITROPHENOL	1600 UJ						
2-CHLORONAPHTHALENE	330 UJ						
2-CHLOROPHENOL	330 UJ						
2-METHYLNAPHTHALENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
2-METHYLPHENOL	330 UJ						
2-NITROANILINE	1600 UJ						
2-NITROPHENOL	330 UJ						
3,3'-DICHLOROBENZIDINE	660 UJ						
3-NITROANILINE	1600 UJ						
4,6-DINITRO-2-METHYLPHENOL	1600 UJ						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-05	W-TR01-06	W-TR01-07	W-TR01-09	W-TR01-10	W-TR01-11	W-TR01-12
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	09/05/96	09/05/96	09/05/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER	330 UJ						
4-CHLORO-3-METHYLPHENOL	330 UJ						
4-CHLOROANILINE	330 UJ						
4-CHLOROPHENYL PHENYL ETHER	330 UJ						
4-METHYLPHENOL	330 UJ						
4-NITROANILINE	1600 UJ						
4-NITROPHENOL	1600 UJ						
ACENAPHTHENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
ACENAPHTHYLENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
ANTHRACENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
BENZO(A)PYRENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
BENZOIC ACID	1600 UJ						
BENZYL ALCOHOL	330 UJ						
BIS(2-CHLOROETHOXY)METHANE	330 UJ						
BIS(2-CHLOROETHYL)ETHER	330 UJ						
BIS(2-CHLOROISOPROPYL) ETHER	330 UJ						
BIS(2-ETHYLHEXYL)PHTHALATE	330 UJ						
BUTYLBENZYL PHTHALATE	330 UJ						
CHRYSENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE	330 UJ						
DI-N-OCTYL PHTHALATE	330 UJ						
DIBENZO(A,H)ANTHRACENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
DIBENZOFURAN	330 UJ						
DIETHYL PHTHALATE	330 UJ						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-05	W-TR01-06	W-TR01-07	W-TR01-09	W-TR01-10	W-TR01-11	W-TR01-12
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	09/05/96	09/05/96	09/05/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE	330 UJ						
FLUORANTHENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
FLUORENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
HEXACHLOROBENZENE	330 UJ						
HEXACHLOROBUTADIENE	330 UJ						
HEXACHLOROCYCLOPENTADIENE	330 UJ						
HEXACHLOROETHANE	330 UJ						
INDENO(1,2,3-CD)PYRENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
ISOPHORONE	330 UJ						
N-NITROSO-DI-N-PROPYLAMINE	330 UJ						
N-NITROSODIPHENYLAMINE	330 UJ						
NAPHTHALENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
PENTACHLOROPHENOL	1600 UJ						
PHENANTHRENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
PHENOL	330 UJ						
PYRENE	330 UJ	330 UJ	330 UJ	330 UJ	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD	16.0 U						
4,4'-DDE	16.0 U						
4,4'-DDT	16.0 U						
ALDRIN	8.0 U						
ALPHA-BHC	8.0 U						
AROCLOR-1016	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1221	80.0 U	80 U	80 U	80 U	80 U	80 U	80 U
AROCLOR-1232	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1242	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1248	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1254	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-05	W-TR01-06	W-TR01-07	W-TR01-09	W-TR01-10	W-TR01-11	W-TR01-12
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	09/05/96	09/05/96	09/05/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
BETA-BHC	8.0 U						
CHLORDANE	80.0 U						
DELTA-BHC	8.0 U						
DIELDRIN	16.0 U						
ENDOSULFAN I	16.0 U						
ENDOSULFAN II	16.0 U						
ENDOSULFAN SULFATE	16.0 U						
ENDRIN	16.0 U						
ENDRIN ALDEHYDE	32.0 U						
GAMMA-BHC (LINDANE)	8.0 U						
HEPTACHLOR	8.0 U						
HEPTACHLOR EPOXIDE	8.0 U						
METHOXYCHLOR	80.0 U						
TOXAPHENE	160 U						
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE	330 UJ						
2,6-DINITROTOLUENE	330 UJ						
NITROBENZENE	330 UJ						
METALS (mg/kg)							
ALUMINUM	5700 L						
ANTIMONY	0.66 UJ						
ARSENIC	2.3 K						
BARIUM	49.7 L						
BERYLLIUM	0.84						
CADMIUM	0.02 UL						
CALCIUM	1150						
CHROMIUM	11.8						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-05	W-TR01-06	W-TR01-07	W-TR01-09	W-TR01-10	W-TR01-11	W-TR01-12
SAMPLE DATE:	08/29/96	08/29/96	08/29/96	08/29/96	09/05/96	09/05/96	09/05/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT	7.3						
COPPER	20.5						
IRON	15600						
LEAD	7.9 J						
MAGNESIUM	2100						
MANGANESE	257 L						
MERCURY	0.04 U						
NICKEL	10.1						
POTASSIUM	852 K						
SELENIUM	1.8 K						
SILVER	0.29 UL						
SODIUM	165						
THALLIUM	1.7 J	1.3 J	1.0 J	1.3 J	1.7 K	1.3 K	1.2 K
VANADIUM	20.0						
ZINC	26.2						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-13	W-TR01-14	W-TR01-15	W-TR01-16	W-TR01-17	W-TR01-23	W-TR01-17-AVG
SAMPLE DATE:	09/05/96	09/05/96	09/05/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:						W-TR01-17	
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE				10 U	10 U	10 U	10 U
2-CHLOROETHYL VINYL ETHER	10 U	10 U	10 U				
2-HEXANONE				10 U	10 U	10 U	10 U
4-METHYL-2-PENTANONE				10 U	10 U	10 U	10 U
ACETONE				10 UJ	10 UJ	10 UJ	10 U
BENZENE				5 U	5 U	5 U	5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE				5 U	5 U	5 U	5 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE				5 U	5 U	5 U	5 U
METHYLENE CHLORIDE	4 B	3 B	3 B	4 B	4 B	4 B	4 B
STYRENE				5 U	5 U	5 U	5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-13	W-TR01-14	W-TR01-15	W-TR01-16	W-TR01-17	W-TR01-23	W-TR01-17-AVG
SAMPLE DATE:	09/05/96	09/05/96	09/05/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:						W-TR01-17	
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE				5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U				
VINYL ACETATE				10 U	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL				15 U	15 U	15 U	15 U
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE				330 U	330 U	330 U	330 U
1,2-DICHLOROBENZENE	5 U	5 U	5 U	330 U	330 U	330 U	330 U
1,3-DICHLOROBENZENE	5 U	5 U	5 U	330 U	330 U	330 U	330 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	330 U	330 U	330 U	330 U
2,4,5-TRICHLOROPHENOL				800 U	800 U	800 U	800 U
2,4,6-TRICHLOROPHENOL				330 U	330 U	330 U	330 U
2,4-DICHLOROPHENOL				330 U	330 U	330 U	330 U
2,4-DIMETHYLPHENOL				330 U	330 U	330 U	330 U
2,4-DINITROPHENOL				1600 U	1600 U	1600 U	1600 U
2-CHLORONAPHTHALENE				330 U	330 U	330 U	330 U
2-CHLOROPHENOL				330 U	330 U	330 U	330 U
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL				330 U	330 U	330 U	330 U
2-NITROANILINE				1600 U	1600 U	1600 U	1600 U
2-NITROPHENOL				330 U	330 U	330 U	330 U
3,3'-DICHLOROBENZIDINE				660 U	660 U	660 U	660 U
3-NITROANILINE				1600 U	1600 U	1600 U	1600 U
4,6-DINITRO-2-METHYLPHENOL				1600 U	1600 U	1600 U	1600 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-13	W-TR01-14	W-TR01-15	W-TR01-16	W-TR01-17	W-TR01-23	W-TR01-17-AVG
SAMPLE DATE:	09/05/96	09/05/96	09/05/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:						W-TR01-17	
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER				330 U	330 U	330 U	330 U
4-CHLORO-3-METHYLPHENOL				330 U	330 U	330 U	330 U
4-CHLOROANILINE				330 U	330 U	330 U	330 U
4-CHLOROPHENYL PHENYL ETHER				330 U	330 U	330 U	330 U
4-METHYLPHENOL				330 U	330 U	330 U	330 U
4-NITROANILINE				1600 U	1600 U	1600 U	1600 U
4-NITROPHENOL				1600 U	1600 U	1600 U	1600 U
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZOIC ACID				1600 U	1600 U	1600 U	1600 U
BENZYL ALCOHOL				330 U	330 U	330 U	330 U
BIS(2-CHLOROETHOXY)METHANE				330 U	330 U	330 U	330 U
BIS(2-CHLOROETHYL)ETHER				330 U	330 U	330 U	330 U
BIS(2-CHLOROISOPROPYL) ETHER				330 U	330 U	330 U	330 U
BIS(2-ETHYLHEXYL)PHTHALATE				330 U	330 U	330 U	330 U
BUTYLBENZYL PHTHALATE				330 U	330 U	330 U	330 U
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE				330 U	330 U	330 U	330 U
DI-N-OCTYL PHTHALATE				330 U	330 U	330 U	330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZOFURAN				330 U	330 U	330 U	330 U
DIETHYL PHTHALATE				330 U	330 U	330 U	330 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-13	W-TR01-14	W-TR01-15	W-TR01-16	W-TR01-17	W-TR01-23	W-TR01-17-AVG
SAMPLE DATE:	09/05/96	09/05/96	09/05/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:						W-TR01-17	
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE				330 U	330 U	330 U	330 U
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE				330 U	330 U	330 U	330 U
HEXACHLOROBUTADIENE				330 U	330 U	330 U	330 U
HEXACHLOROCYCLOPENTADIENE				330 U	330 U	330 U	330 U
HEXACHLOROETHANE				330 U	330 U	330 U	330 U
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ISOPHORONE				330 U	330 U	330 U	330 U
N-NITROSO-DI-N-PROPYLAMINE				330 U	330 U	330 U	330 U
N-NITROSODIPHENYLAMINE				330 U	330 U	330 U	330 U
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL				1600 U	1600 U	1600 U	1600 U
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENOL				330 U	330 U	330 U	330 U
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD				16.0 U	16.0 U	16.0 U	16 U
4,4'-DDE				16.0 U	16.0 U	16.0 U	16 U
4,4'-DDT				4.5 J	16.0 U	16.0 U	16 U
ALDRIN				8.0 U	8.0 U	8.0 U	8 U
ALPHA-BHC				8.0 U	8.0 U	8.0 U	8 U
AROCLOR-1016	40 U	40 U	40 U	40.0 U	40.0 U	40.0 U	40 U
AROCLOR-1221	80 U	80 U	80 U	80.0 U	80.0 U	80.0 U	80 U
AROCLOR-1232	40 U	40 U	40 U	40.0 U	40.0 U	40.0 U	40 U
AROCLOR-1242	40 U	40 U	40 U	40.0 U	40.0 U	40.0 U	40 U
AROCLOR-1248	40 U	40 U	40 U	40.0 U	40.0 U	40.0 U	40 U
AROCLOR-1254	40 U	3 J	40 U	40.0 U	40.0 U	40.0 U	40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-13	W-TR01-14	W-TR01-15	W-TR01-16	W-TR01-17	W-TR01-23	W-TR01-17-AVG
SAMPLE DATE:	09/05/96	09/05/96	09/05/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:						W-TR01-17	
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40 U	40 U	40.0 U	40.0 U	40.0 U	40 U
BETA-BHC				8.0 U	8.0 U	8.0 U	8 U
CHLORDANE				80.0 U	80.0 U	80.0 U	80 U
DELTA-BHC				8.0 U	8.0 U	8.0 U	8 U
DIELDRIN				16.0 U	16.0 U	16.0 U	16 U
ENDOSULFAN I				16.0 U	16.0 U	16.0 U	16 U
ENDOSULFAN II				16.0 U	16.0 U	16.0 U	16 U
ENDOSULFAN SULFATE				16.0 U	16.0 U	16.0 U	16 U
ENDRIN				16.0 U	16.0 U	16.0 U	16 U
ENDRIN ALDEHYDE				32.0 U	32.0 U	32.0 U	32 U
GAMMA-BHC (LINDANE)				8.0 U	8.0 U	8.0 U	8 U
HEPTACHLOR				8.0 U	8.0 U	8.0 U	8 U
HEPTACHLOR EPOXIDE				8.0 U	8.0 U	8.0 U	8 U
METHOXYCHLOR				80.0 U	80.0 U	80.0 U	80 U
TOXAPHENE				160 U	160 U	160 U	160 U
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE				330 U	330 U	330 U	330 U
2,6-DINITROTOLUENE				330 U	330 U	330 U	330 U
NITROBENZENE				330 U	330 U	330 U	330 U
METALS (mg/kg)							
ALUMINUM				15400	16500	15100	15800
ANTIMONY				0.72 J	1.2 J	1.3 J	1.25 J
ARSENIC				2.8 L	2.2 L	4.3 L	3.25 L
BARIUM				64.0	32.7 K	34.3 K	33.5 K
BERYLLIUM				0.78	0.67	0.66	0.67
CADMIUM				0.04 U	0.04 UL	0.03 UL	0.035 U
CALCIUM				1160	594 K	472 K	533 K
CHROMIUM				22.3	21.2	20.5	20.85

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-13	W-TR01-14	W-TR01-15	W-TR01-16	W-TR01-17	W-TR01-23	W-TR01-17-AVG
SAMPLE DATE:	09/05/96	09/05/96	09/05/96	09/12/96	09/12/96	09/12/96	09/12/96
STATUS:							
TRENCH:	1	1	1	1	1	1	1
FIELD DUPLICATE OF:						W-TR01-17	
METALS (mg/kg)							
COBALT				9.6	9.8	8.1 K	8.95 K
COPPER				31.9 L	42.5 L	40.2 L	41.35 L
IRON				20600	19700	17700	18700
LEAD				13.6 K	7.7 K	6.9 K	7.3 K
MAGNESIUM				2490	2400	2120	2260
MANGANESE				403 J	404 J	281 J	342.5 J
MERCURY				0.04 U	0.04 U	0.04 U	0.04 U
NICKEL				12.2	12.6	11.9	12.25
POTASSIUM				1240	879 K	681 K	780 K
SELENIUM				1.4 J	1.5 J	3.3 J	2.4 J
SILVER				0.31 UL	0.30 UL	0.29 UL	0.30 U
SODIUM				189 K	222 K	174 K	198 K
THALLIUM	1.1 K	1.1 K	1.3 K	1.4 J	1.4 J	3.9 J	2.65 J
VANADIUM				35.0	33.4	32.0	32.7
ZINC				44.3 J	42.4 J	27.9 J	35.15 J

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-18	W-TR01-19	W-TR01-19R	W-TR01-20	W-TR01-21	W-TR01-22	W-TR02-00
SAMPLE DATE:	10/30/96	10/30/96	11/20/96	10/30/96	10/30/96	10/30/96	10/03/96
STATUS:		Excavated					
TRENCH:	1	1	1	1	1	1	2
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U		5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U		5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U		5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U		5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U		5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U		5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U		5 U	5 U	5 U	5 U
2-BUTANONE		10 U		10 U		10 U	
2-CHLOROETHYL VINYL ETHER	10 UJ				10 UJ		10 UR
2-HEXANONE		10 U		10 U		10 U	
4-METHYL-2-PENTANONE		10 U		10 U		10 U	
ACETONE		10 U		10 U		10 U	
BENZENE		5 U		5 U		5 U	
BROMODICHLOROMETHANE	5 U	5 U		5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U		5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U		10 U	10 U	10 U	10 U
CARBON DISULFIDE		5 U		5 U		5 U	
CARBON TETRACHLORIDE	5 U	5 U		5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U		5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U		10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U		5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U		10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U		5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U		5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U		5 U	5 U	5 U	5 U
ETHYLBENZENE		5 U		5 U		5 U	
METHYLENE CHLORIDE	5 U	6		5 U	5 U	5 U	5 U
STYRENE		5 U		5 U		5 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-18	W-TR01-19	W-TR01-19R	W-TR01-20	W-TR01-21	W-TR01-22	W-TR02-00
SAMPLE DATE:	10/30/96	10/30/96	11/20/96	10/30/96	10/30/96	10/30/96	10/03/96
STATUS:		Excavated					
TRENCH:	1	1	1	1	1	1	2
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U		5 U	5 U	5 U	5 U
TOLUENE		5 U		5 U		5 U	
TRANS-1,2-DICHLOROETHENE	5 U	5 U		5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U		5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U		5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U				5 U		5 U
VINYL ACETATE		10 U		10 U		10 U	
VINYL CHLORIDE	10 U	10 U		10 U	10 U	10 U	10 U
XYLENES, TOTAL		15 U		15 U		15 U	
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE		330 U		330 U		330 U	
1,2-DICHLOROBENZENE	5 U	330 U		330 U	5 U	330 U	5 U
1,3-DICHLOROBENZENE	5 U	330 U		330 U	5 U	330 U	5 U
1,4-DICHLOROBENZENE	5 U	330 U		330 U	5 U	330 U	5 U
2,4,5-TRICHLOROPHENOL		800 U		800 U		800 U	
2,4,6-TRICHLOROPHENOL		330 U		330 U		330 U	
2,4-DICHLOROPHENOL		330 U		330 U		330 U	
2,4-DIMETHYLPHENOL		330 U		330 U		330 U	
2,4-DINITROPHENOL		1600 UJ		1600 UJ		1600 UJ	
2-CHLORONAPHTHALENE		330 U		330 U		330 U	
2-CHLOROPHENOL		330 U		330 U		330 U	
2-METHYLNAPHTHALENE	330 U	330 U		330 U	330 U	330 U	330 U
2-METHYLPHENOL		330 U		330 U		330 U	
2-NITROANILINE		1600 U		1600 U		1600 U	
2-NITROPHENOL		330 U		330 U		330 U	
3,3'-DICHLOROBENZIDINE		660 U		660 U		660 U	
3-NITROANILINE		1600 U		1600 U		1600 U	
4,6-DINITRO-2-METHYLPHENOL		1600 U		1600 U		1600 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-18	W-TR01-19	W-TR01-19R	W-TR01-20	W-TR01-21	W-TR01-22	W-TR02-00
SAMPLE DATE:	10/30/96	10/30/96	11/20/96	10/30/96	10/30/96	10/30/96	10/03/96
STATUS:		Excavated					
TRENCH:	1	1	1	1	1	1	2
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER		330 U		330 U		330 U	
4-CHLORO-3-METHYLPHENOL		330 U		330 U		330 U	
4-CHLOROANILINE		330 U		330 U		330 U	
4-CHLOROPHENYL PHENYL ETHER		330 U		330 U		330 U	
4-METHYLPHENOL		330 U		330 U		330 U	
4-NITROANILINE		1600 U		1600 U		1600 U	
4-NITROPHENOL		1600 U		1600 U		1600 U	
ACENAPHTHENE	330 U	330 U		330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U		330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U		330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U		330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U		330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U		330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U		330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U		330 U	330 U	330 U	330 U
BENZOIC ACID		1600 U		1600 U		1600 U	
BENZYL ALCOHOL		330 U		330 U		330 U	
BIS(2-CHLOROETHOXY)METHANE		330 U		330 U		330 U	
BIS(2-CHLOROETHYL)ETHER		330 U		330 U		330 U	
BIS(2-CHLOROISOPROPYL) ETHER		330 U		330 U		330 U	
BIS(2-ETHYLHEXYL)PHTHALATE		330 U		1800		330 U	
BUTYLBENZYL PHTHALATE		330 U		330 U		330 U	
CHRYSENE	330 U	330 U		330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE		330 U		330 U		330 U	
DI-N-OCTYL PHTHALATE		330 U		330 U		330 U	
DIBENZO(A,H)ANTHRACENE	330 U	330 U		330 U	330 U	330 U	330 U
DIBENZOFURAN		330 U		330 U		330 U	
DIETHYL PHTHALATE		330 U		330 U		330 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-18	W-TR01-19	W-TR01-19R	W-TR01-20	W-TR01-21	W-TR01-22	W-TR02-00
SAMPLE DATE:	10/30/96	10/30/96	11/20/96	10/30/96	10/30/96	10/30/96	10/03/96
STATUS:		Excavated					
TRENCH:	1	1	1	1	1	1	2
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE		330 U		330 U		330 U	
FLUORANTHENE	52 J	330 U		330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U		330 U	330 U	330 U	330 U
HEXACHLOROBENZENE		330 U		330 U		330 U	
HEXACHLOROBUTADIENE		330 U		330 U		330 U	
HEXACHLOROCYCLOPENTADIENE		330 U		330 U		330 U	
HEXACHLOROETHANE		330 U		330 U		330 U	
INDENO(1,2,3-CD)PYRENE	330 U	330 U		330 U	330 U	330 U	330 U
ISOPHORONE		330 U		330 U		330 U	
N-NITROSO-DI-N-PROPYLAMINE		330 U		330 U		330 U	
N-NITROSODIPHENYLAMINE		330 U		330 U		330 U	
NAPHTHALENE	330 U	330 U		330 U	330 U	330 U	330 U
PENTACHLOROPHENOL		1600 U		1600 U		1600 U	
PHENANTHRENE	330 U	330 U		330 U	330 U	330 U	330 U
PHENOL		330 U		330 U		330 U	
PYRENE	50 J	330 U		330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD		16.0 U		16.0 U		16.0 U	
4,4'-DDE		16.0 U		16.0 U		16.0 U	
4,4'-DDT		16.0 U		16.0 U		16.0 U	
ALDRIN		8.0 U		8.0 U		8.0 U	
ALPHA-BHC		8.0 U		8.0 U		8.0 U	
AROCLOR-1016	40 U	40.0 U		40.0 U	40 U	40.0 U	40 U
AROCLOR-1221	80 U	80.0 U		80.0 U	80 U	80.0 U	80 U
AROCLOR-1232	40 U	40.0 U		40.0 U	40 U	40.0 U	40 U
AROCLOR-1242	40 U	40.0 U		40.0 U	40 U	40.0 U	40 U
AROCLOR-1248	40 U	40.0 U		40.0 U	40 U	40.0 U	40 U
AROCLOR-1254	40 U	40.0 U		40.0 U	40 U	40.0 U	40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-18	W-TR01-19	W-TR01-19R	W-TR01-20	W-TR01-21	W-TR01-22	W-TR02-00
SAMPLE DATE:	10/30/96	10/30/96	11/20/96	10/30/96	10/30/96	10/30/96	10/03/96
STATUS:		Excavated					
TRENCH:	1	1	1	1	1	1	2
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40.0 U		40.0 U	40 U	40.0 U	40 U
BETA-BHC		8.0 U		8.0 U		8.0 U	
CHLORDANE		80.0 U		80.0 U		80.0 U	
DELTA-BHC		8.0 U		8.0 U		8.0 U	
DIELDRIN		16.0 U		16.0 U		16.0 U	
ENDOSULFAN I		16.0 U		16.0 U		16.0 U	
ENDOSULFAN II		16.0 U		16.0 U		16.0 U	
ENDOSULFAN SULFATE		16.0 U		16.0 U		16.0 U	
ENDRIN		16.0 U		16.0 U		16.0 U	
ENDRIN ALDEHYDE		32.0 U		32.0 U		32.0 U	
GAMMA-BHC (LINDANE)		8.0 U		8.0 U		8.0 U	
HEPTACHLOR		8.0 U		8.0 U		8.0 U	
HEPTACHLOR EPOXIDE		8.0 U		8.0 U		8.0 U	
METHOXYCHLOR		80.0 U		80.0 U		80.0 U	
TOXAPHENE		160 U		160 U		160 U	
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE		330 U		330 U		330 U	
2,6-DINITROTOLUENE		330 U		330 U		330 U	
NITROBENZENE		330 U		330 U		330 U	
METALS (mg/kg)							
ALUMINUM		21400	13600	8200		9090	
ANTIMONY		0.77 U		0.65 U		0.64 U	
ARSENIC		8.5 K		3.6		2.9	
BARIUM		49.7		48.4		38.2	
BERYLLIUM		0.86 J		0.71 J		0.60 J	
CADMIUM		0.04 UL		0.03 U		0.03 U	
CALCIUM		685		1260		524	
CHROMIUM		29.5		5.2		5.3	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR01-18	W-TR01-19	W-TR01-19R	W-TR01-20	W-TR01-21	W-TR01-22	W-TR02-00
SAMPLE DATE:	10/30/96	10/30/96	11/20/96	10/30/96	10/30/96	10/30/96	10/03/96
STATUS:		Excavated					
TRENCH:	1	1	1	1	1	1	2
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT		10.0		6.8		7.5	
COPPER		15.0		79.2		91.5	
IRON		27700		8540		8530	
LEAD		9.7		3.0		2.0	
MAGNESIUM		3590		1550		2360	
MANGANESE		254 K		558 K		641 K	
MERCURY		0.05 U		0.04 U		0.04 U	
NICKEL		15.7		7.9		12.8	
POTASSIUM		1980		239		164	
SELENIUM		1.9 J		1.0		1.0	
SILVER		0.34 UL		0.28 UL		0.28 UL	
SODIUM		491 B		607 B		503 B	
THALLIUM	2.0 B	1.9 B		0.96	0.89 B	1.1	0.82 J
VANADIUM		45.5		10.8		13.0	
ZINC		40.1		18.1		17.8	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-06	W-TR02-00-AVG	W-TR02-01	W-TR02-02	W-TR02-03	W-TR02-04	W-TR02-05
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:	W-TR02-00						
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-CHLOROETHYL VINYL ETHER	10 UR	5 R	10 UR	10 UR	10 UR	10 UR	10 UR
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
METHYLENE CHLORIDE	4 J	4 J	5 U	5 U	5 U	4 J	5 U
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
SEMIVOLATILES (µg/kg)							
1,2-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-06	W-TR02-00-AVG	W-TR02-01	W-TR02-02	W-TR02-03	W-TR02-04	W-TR02-05
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:	W-TR02-00						
SEMIVOLATILES (µg/kg)							
1,3-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	46 J	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	46 J	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	56 J	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	16 J	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	29 J	330 U	330 U	330 U	330 U
CHRYSENE	330 U	330 U	49 J	330 U	330 U	330 U	330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORANTHENE	330 U	330 U	71 J	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
INDENO(1,2,3-CD)PYRENE	330 U	330 U	17 J	330 U	330 U	330 U	330 U
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENANTHRENE	330 U	330 U	31 J	330 U	330 U	330 U	330 U
PYRENE	330 U	330 U	73 J	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1016	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1221	80 U	80 U	80 U	80 U	80 U	80 U	80 U
AROCLOR-1232	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1242	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1248	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1254	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1260	40 U	40 U	40 U	40 U	40 U	40 U	40 U
METALS (mg/kg)							

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-06	W-TR02-00-AVG	W-TR02-01	W-TR02-02	W-TR02-03	W-TR02-04	W-TR02-05
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:	W-TR02-00						
METALS (mg/kg)							
THALLIUM	1.5 J	1.16 J	1.1 J	2.1	0.61 J	0.44 UJ	1.8 J

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-07	W-TR02-08	W-TR02-09	W-TR02-10	W-TR02-11	W-TR02-12	W-TR02-13
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE		10 UJ	10 UJ				
2-CHLOROETHYL VINYL ETHER	10 UR			10 UR	10 UR	10 UR	10 UR
2-HEXANONE		10 UJ	10 UJ				
4-METHYL-2-PENTANONE		10 U	10 U				
ACETONE		10 UJ	10 UJ				
BENZENE		5 U	5 U				
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE		5 U	5 U				
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE		5 U	5 U				
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
STYRENE		5 U	5 U				

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-07	W-TR02-08	W-TR02-09	W-TR02-10	W-TR02-11	W-TR02-12	W-TR02-13
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE		5 U	5 U				
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U			5 U	5 U	5 U	5 U
VINYL ACETATE		10 U	10 U				
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL		15 U	15 U				
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE		330 U	330 U				
1,2-DICHLOROBENZENE	5 U	330 U	330 U	5 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	5 U	330 U	330 U	5 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	5 U	330 U	330 U	5 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL		800 U	800 U				
2,4,6-TRICHLOROPHENOL		330 U	330 U				
2,4-DICHLOROPHENOL		330 U	330 U				
2,4-DIMETHYLPHENOL		330 U	330 U				
2,4-DINITROPHENOL		1600 U	1600 U				
2-CHLORONAPHTHALENE		330 U	330 U				
2-CHLOROPHENOL		330 U	330 U				
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL		330 U	330 U				
2-NITROANILINE		1600 U	1600 U				
2-NITROPHENOL		330 U	330 U				
3,3'-DICHLOROBENZIDINE		660 U	660 U				
3-NITROANILINE		1600 U	1600 U				
4,6-DINITRO-2-METHYLPHENOL		1600 U	1600 U				

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-07	W-TR02-08	W-TR02-09	W-TR02-10	W-TR02-11	W-TR02-12	W-TR02-13
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER		330 U	330 U				
4-CHLORO-3-METHYLPHENOL		330 U	330 U				
4-CHLOROANILINE		330 U	330 U				
4-CHLOROPHENYL PHENYL ETHER		330 U	330 U				
4-METHYLPHENOL		330 U	330 U				
4-NITROANILINE		1600 U	1600 U				
4-NITROPHENOL		1600 U	1600 U				
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZOIC ACID		1600 U	1600 U				
BENZYL ALCOHOL		330 U	330 U				
BIS(2-CHLOROETHOXY)METHANE		330 U	330 U				
BIS(2-CHLOROETHYL)ETHER		330 U	330 U				
BIS(2-CHLOROISOPROPYL) ETHER		330 U	330 U				
BIS(2-ETHYLHEXYL)PHTHALATE		330 U	36 J				
BUTYLBENZYL PHTHALATE		330 U	330 U				
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE		330 U	330 U				
DI-N-OCTYL PHTHALATE		330 U	330 U				
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZOFURAN		330 U	330 U				
DIETHYL PHTHALATE		330 U	330 U				

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-07	W-TR02-08	W-TR02-09	W-TR02-10	W-TR02-11	W-TR02-12	W-TR02-13
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE		330 U	330 U				
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE		330 U	330 U				
HEXACHLOROBUTADIENE		330 U	330 U				
HEXACHLOROCYCLOPENTADIENE		330 U	330 U				
HEXACHLOROETHANE		330 U	330 U				
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ISOPHORONE		330 U	330 U				
N-NITROSO-DI-N-PROPYLAMINE		330 U	330 U				
N-NITROSODIPHENYLAMINE		330 U	330 U				
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL		1600 U	1600 U				
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENOL		330 U	330 U				
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD		16.0 U	16.0 U				
4,4'-DDE		16.0 U	16.0 U				
4,4'-DDT		16.0 U	16.0 U				
ALDRIN		8.0 U	8.0 U				
ALPHA-BHC		8.0 U	8.0 U				
AROCLOR-1016	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U
AROCLOR-1221	80 U	80.0 U	80.0 U	80 U	80 U	80 U	80 U
AROCLOR-1232	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U
AROCLOR-1242	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U
AROCLOR-1248	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U
AROCLOR-1254	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-07	W-TR02-08	W-TR02-09	W-TR02-10	W-TR02-11	W-TR02-12	W-TR02-13
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U
BETA-BHC		8.0 U	8.0 U				
CHLORDANE		80.0 U	80.0 U				
DELTA-BHC		8.0 U	8.0 U				
DIELDRIN		16.0 U	16.0 U				
ENDOSULFAN I		16.0 U	16.0 U				
ENDOSULFAN II		16.0 U	16.0 U				
ENDOSULFAN SULFATE		16.0 U	16.0 U				
ENDRIN		16.0 U	16.0 U				
ENDRIN ALDEHYDE		32.0 U	32.0 U				
GAMMA-BHC (LINDANE)		8.0 U	8.0 U				
HEPTACHLOR		8.0 U	8.0 U				
HEPTACHLOR EPOXIDE		8.0 U	8.0 U				
METHOXYCHLOR		80.0 U	80.0 U				
TOXAPHENE		160 U	160 U				
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE		330 U	330 U				
2,6-DINITROTOLUENE		330 U	330 U				
NITROBENZENE		330 U	330 U				
METALS (mg/kg)							
ALUMINUM		7300	10200				
ANTIMONY		0.69 UL	0.69 UL				
ARSENIC		5.0 K	7.9 K				
BARIUM		63.9 J	75.2 J				
BERYLLIUM		0.72 L	1.1				
CADMIUM		0.03 UL	0.04 UL				
CALCIUM		1500	1500				
CHROMIUM		11.6	24.4				

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-07	W-TR02-08	W-TR02-09	W-TR02-10	W-TR02-11	W-TR02-12	W-TR02-13
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT		7.4 K	7.3 K				
COPPER		18.0	19.2				
IRON		12300 J	24400 J				
LEAD		5.5	7.7				
MAGNESIUM		1500	2870				
MANGANESE		626	218				
MERCURY		0.04 U	0.08 U				
NICKEL		7.4 K	11.2				
POTASSIUM		494 K	877 K				
SELENIUM		2.3	1.8				
SILVER		0.30 UL	0.30 UL				
SODIUM		208 B	407 B				
THALLIUM	1.5 J	2.1 J	2.1 J	2.6	2.1	1.4 J	2.2
VANADIUM		18.3 J	44.6 J				
ZINC		20.6	38.3				

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-14	W-TR02-15	W-TR02-16	W-TR02-17	W-TR02-21	W-TR02-17-AVG	W-TR02-18
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:					W-TR02-17		
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE							10 UJ
2-CHLOROETHYL VINYL ETHER	10 UR	10 UR	10 UR	10 UR	10 UR	5 R	
2-HEXANONE							10 UJ
4-METHYL-2-PENTANONE							10 U
ACETONE							10 UJ
BENZENE							5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE							5 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE							5 U
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
STYRENE							5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-14	W-TR02-15	W-TR02-16	W-TR02-17	W-TR02-21	W-TR02-17-AVG	W-TR02-18
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:					W-TR02-17		
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE							5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	
VINYL ACETATE							10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL							15 U
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE							330 U
1,2-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	330 U
1,3-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	330 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	330 U
2,4,5-TRICHLOROPHENOL							800 U
2,4,6-TRICHLOROPHENOL							330 U
2,4-DICHLOROPHENOL							330 U
2,4-DIMETHYLPHENOL							330 U
2,4-DINITROPHENOL							1600 U
2-CHLORONAPHTHALENE							330 U
2-CHLOROPHENOL							330 U
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL							330 U
2-NITROANILINE							1600 U
2-NITROPHENOL							330 U
3,3'-DICHLOROBENZIDINE							660 U
3-NITROANILINE							1600 U
4,6-DINITRO-2-METHYLPHENOL							1600 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-14	W-TR02-15	W-TR02-16	W-TR02-17	W-TR02-21	W-TR02-17-AVG	W-TR02-18
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:					W-TR02-17		
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER							330 U
4-CHLORO-3-METHYLPHENOL							330 U
4-CHLOROANILINE							330 U
4-CHLOROPHENYL PHENYL ETHER							330 U
4-METHYLPHENOL							330 U
4-NITROANILINE							1600 U
4-NITROPHENOL							1600 U
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZOIC ACID							1600 U
BENZYL ALCOHOL							330 U
BIS(2-CHLOROETHOXY)METHANE							330 U
BIS(2-CHLOROETHYL)ETHER							330 U
BIS(2-CHLOROISOPROPYL) ETHER							330 U
BIS(2-ETHYLHEXYL)PHTHALATE							330 U
BUTYLBENZYL PHTHALATE							330 U
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE							330 U
DI-N-OCTYL PHTHALATE							330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZOFURAN							330 U
DIETHYL PHTHALATE							330 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-14	W-TR02-15	W-TR02-16	W-TR02-17	W-TR02-21	W-TR02-17-AVG	W-TR02-18
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:					W-TR02-17		
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE							330 U
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE							330 U
HEXACHLOROBUTADIENE							330 U
HEXACHLOROCYCLOPENTADIENE							330 U
HEXACHLOROETHANE							330 U
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ISOPHORONE							330 U
N-NITROSO-DI-N-PROPYLAMINE							330 U
N-NITROSODIPHENYLAMINE							330 U
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL							1600 U
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENOL							330 U
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD							16.0 U
4,4'-DDE							16.0 U
4,4'-DDT							16.0 U
ALDRIN							8.0 U
ALPHA-BHC							8.0 U
AROCLOR-1016	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1221	80 U	80 U	80 U	80 U	80 U	80 U	80.0 U
AROCLOR-1232	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1242	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1248	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
AROCLOR-1254	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-14	W-TR02-15	W-TR02-16	W-TR02-17	W-TR02-21	W-TR02-17-AVG	W-TR02-18
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:					W-TR02-17		
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40 U	40 U	40 U	40 U	40 U	40.0 U
BETA-BHC							8.0 U
CHLORDANE							80.0 U
DELTA-BHC							8.0 U
DIELDRIN							16.0 U
ENDOSULFAN I							16.0 U
ENDOSULFAN II							16.0 U
ENDOSULFAN SULFATE							16.0 U
ENDRIN							16.0 U
ENDRIN ALDEHYDE							32.0 U
GAMMA-BHC (LINDANE)							8.0 U
HEPTACHLOR							8.0 U
HEPTACHLOR EPOXIDE							8.0 U
METHOXYCHLOR							80.0 U
TOXAPHENE							160 U
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE							330 U
2,6-DINITROTOLUENE							330 U
NITROBENZENE							330 U
METALS (mg/kg)							
ALUMINUM							7720
ANTIMONY							0.69 UL
ARSENIC							3.2
BARIUM							57.4 J
BERYLLIUM							0.91 L
CADMIUM							0.04 U
CALCIUM							1180
CHROMIUM							19.2

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-14	W-TR02-15	W-TR02-16	W-TR02-17	W-TR02-21	W-TR02-17-AVG	W-TR02-18
SAMPLE DATE:	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96	10/03/96
STATUS:							
TRENCH:	2	2	2	2	2	2	2
FIELD DUPLICATE OF:					W-TR02-17		
METALS (mg/kg)							
COBALT							5.8 K
COPPER							59.5
IRON							11700 J
LEAD							3.0
MAGNESIUM							1420
MANGANESE							371
MERCURY							0.04 U
NICKEL							8.0
POTASSIUM							345 K
SELENIUM							1.3 B
SILVER							0.29 UL
SODIUM							237 B
THALLIUM	0.74 J	1.9 J	0.62 J	2.2	0.76 J	1.48 J	1.5 J
VANADIUM							23.7 J
ZINC							15.1

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-19	W-TR02-20	W-TR03-01	W-TR03-02	W-TR03-03	W-TR03-04	W-TR03-26
SAMPLE DATE:	10/03/96	10/03/96	08/28/96	08/28/96	08/26/96	08/26/96	08/26/96
STATUS:						Excavated	Excavated
TRENCH:	2	2	3	3	3	3	3
FIELD DUPLICATE OF:							W-TR03-04
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE	10 UJ					10 U	10 U
2-CHLOROETHYL VINYL ETHER		10 UR	10 U	10 U	10 U		
2-HEXANONE	10 UJ					10 U	10 U
4-METHYL-2-PENTANONE	10 U					10 U	10 U
ACETONE	10 UJ					10 U	10 U
BENZENE	5 U					5 U	5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE	5 U					5 U	5 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	2 B	2 B	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	5 U					5 U	5 U
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	3 B	3 B	3 B
STYRENE	5 U					5 U	5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-19	W-TR02-20	W-TR03-01	W-TR03-02	W-TR03-03	W-TR03-04	W-TR03-26
SAMPLE DATE:	10/03/96	10/03/96	08/28/96	08/28/96	08/26/96	08/26/96	08/26/96
STATUS:						Excavated	Excavated
TRENCH:	2	2	3	3	3	3	3
FIELD DUPLICATE OF:							W-TR03-04
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	5 U					5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE		5 U	5 U	5 U	5 U		
VINYL ACETATE	10 U					10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL	15 U					15 U	15 U
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE	330 U					330 U	330 U
1,2-DICHLOROBENZENE	330 U	5 U	5 U	5 U	5 U	330 U	330 U
1,3-DICHLOROBENZENE	330 U	5 U	5 U	5 U	5 U	330 U	330 U
1,4-DICHLOROBENZENE	330 U	5 U	5 U	5 U	5 U	330 U	330 U
2,4,5-TRICHLOROPHENOL	800 U					800 U	800 U
2,4,6-TRICHLOROPHENOL	330 U					330 U	330 U
2,4-DICHLOROPHENOL	330 U					330 U	330 U
2,4-DIMETHYLPHENOL	330 U					330 U	330 U
2,4-DINITROPHENOL	1600 U					1600 U	1600 U
2-CHLORONAPHTHALENE	330 U					330 U	330 U
2-CHLOROPHENOL	330 U					330 U	330 U
2-METHYLNAPHTHALENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
2-METHYLPHENOL	330 U					330 U	330 U
2-NITROANILINE	1600 U					1600 U	1600 U
2-NITROPHENOL	330 U					330 U	330 U
3,3'-DICHLOROBENZIDINE	660 U					660 U	660 U
3-NITROANILINE	1600 U					1600 U	1600 U
4,6-DINITRO-2-METHYLPHENOL	1600 U					1600 U	1600 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-19	W-TR02-20	W-TR03-01	W-TR03-02	W-TR03-03	W-TR03-04	W-TR03-26
SAMPLE DATE:	10/03/96	10/03/96	08/28/96	08/28/96	08/26/96	08/26/96	08/26/96
STATUS:						Excavated	Excavated
TRENCH:	2	2	3	3	3	3	3
FIELD DUPLICATE OF:							W-TR03-04
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER	330 U					330 U	330 U
4-CHLORO-3-METHYLPHENOL	330 U					330 U	330 U
4-CHLOROANILINE	330 U					330 U	330 U
4-CHLOROPHENYL PHENYL ETHER	330 U					330 U	330 U
4-METHYLPHENOL	330 U					330 U	330 U
4-NITROANILINE	1600 U					1600 U	1600 U
4-NITROPHENOL	1600 U					1600 U	1600 U
ACENAPHTHENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
BENZOIC ACID	1600 U					1600 U	1600 U
BENZYL ALCOHOL	330 U					330 U	330 U
BIS(2-CHLOROETHOXY)METHANE	330 U					330 U	330 U
BIS(2-CHLOROETHYL)ETHER	330 U					330 U	330 U
BIS(2-CHLOROISOPROPYL) ETHER	330 U					330 U	330 U
BIS(2-ETHYLHEXYL)PHTHALATE	330 U					330 U	330 U
BUTYLBENZYL PHTHALATE	330 U					330 U	330 U
CHRYSENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE	330 U					330 U	330 U
DI-N-OCTYL PHTHALATE	330 U					330 U	330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
DIBENZOFURAN	330 U					330 U	330 U
DIETHYL PHTHALATE	330 U					330 U	330 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-19	W-TR02-20	W-TR03-01	W-TR03-02	W-TR03-03	W-TR03-04	W-TR03-26
SAMPLE DATE:	10/03/96	10/03/96	08/28/96	08/28/96	08/26/96	08/26/96	08/26/96
STATUS:						Excavated	Excavated
TRENCH:	2	2	3	3	3	3	3
FIELD DUPLICATE OF:							W-TR03-04
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE	330 U					330 U	330 U
FLUORANTHENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
HEXACHLOROBENZENE	330 U					330 U	330 U
HEXACHLOROBUTADIENE	330 U					330 U	330 U
HEXACHLOROCYCLOPENTADIENE	330 U					330 U	330 U
HEXACHLOROETHANE	330 U					330 U	330 U
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
ISOPHORONE	330 U					330 U	330 U
N-NITROSO-DI-N-PROPYLAMINE	330 U					330 U	330 U
N-NITROSODIPHENYLAMINE	330 U					330 U	330 U
NAPHTHALENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
PENTACHLOROPHENOL	1600 U					1600 U	1600 U
PHENANTHRENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
PHENOL	330 U					330 U	330 U
PYRENE	330 U	330 U	330 UJ	330 UJ	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD	16.0 U					16.0 U	16.0 U
4,4'-DDE	16.0 U					16.0 U	16.0 U
4,4'-DDT	16.0 U					16.0 U	16.0 U
ALDRIN	8.0 U					8.0 U	8.0 U
ALPHA-BHC	8.0 U					8.0 U	8.0 U
AROCLOR-1016	40.0 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1221	80.0 U	80 U	80 U	80 U	80 U	80.0 U	80.0 U
AROCLOR-1232	40.0 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1242	40.0 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1248	40.0 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1254	40.0 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-19	W-TR02-20	W-TR03-01	W-TR03-02	W-TR03-03	W-TR03-04	W-TR03-26
SAMPLE DATE:	10/03/96	10/03/96	08/28/96	08/28/96	08/26/96	08/26/96	08/26/96
STATUS:						Excavated	Excavated
TRENCH:	2	2	3	3	3	3	3
FIELD DUPLICATE OF:							W-TR03-04
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40.0 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U
BETA-BHC	8.0 U					8.0 U	8.0 U
CHLORDANE	80.0 U					80.0 U	80.0 U
DELTA-BHC	8.0 U					8.0 U	8.0 U
DIELDRIN	16.0 U					16.0 U	16.0 U
ENDOSULFAN I	16.0 U					16.0 U	16.0 U
ENDOSULFAN II	16.0 U					16.0 U	16.0 U
ENDOSULFAN SULFATE	16.0 U					16.0 U	16.0 U
ENDRIN	16.0 U					16.0 U	16.0 U
ENDRIN ALDEHYDE	32.0 U					32.0 U	32.0 U
GAMMA-BHC (LINDANE)	8.0 U					8.0 U	8.0 U
HEPTACHLOR	8.0 U					8.0 U	8.0 U
HEPTACHLOR EPOXIDE	8.0 U					8.0 U	8.0 U
METHOXYCHLOR	80.0 U					80.0 U	80.0 U
TOXAPHENE	160 U					160 U	160 U
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE	330 U					330 U	330 U
2,6-DINITROTOLUENE	330 U					330 U	330 U
NITROBENZENE	330 U					330 U	330 U
METALS (mg/kg)							
ALUMINUM	12700					9210 L	9900 L
ANTIMONY	0.64 UL					0.82 B	0.92 B
ARSENIC	4.3 K					0.33 UJ	0.36 J
BARIUM	27.7 J					103 L	101 L
BERYLLIUM	0.62 L					2.3	2.3
CADMIUM	0.03 UL					0.04 UL	0.04 UL
CALCIUM	424 K					4050 J	3990 J
CHROMIUM	14.5					15.7	16.2

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR02-19	W-TR02-20	W-TR03-01	W-TR03-02	W-TR03-03	W-TR03-04	W-TR03-26
SAMPLE DATE:	10/03/96	10/03/96	08/28/96	08/28/96	08/26/96	08/26/96	08/26/96
STATUS:						Excavated	Excavated
TRENCH:	2	2	3	3	3	3	3
FIELD DUPLICATE OF:							W-TR03-04
METALS (mg/kg)							
COBALT	10.3					11.2	11.8
COPPER	48.4					20.4	20.6
IRON	14800 J					17400 L	18400 L
LEAD	4.0					9.7 K	11.0 K
MAGNESIUM	3420					6410	6310
MANGANESE	549					214	197
MERCURY	0.04 U					0.04 U	0.04 U
NICKEL	15.4					23.9	22.3
POTASSIUM	672 K					2870	3100
SELENIUM	1.8					0.66 J	1.2 K
SILVER	0.28 UL					0.29 UL	0.29 U
SODIUM	232 B					141 B	131 B
THALLIUM	1.7 J	2.4	0.84 J	2.4	1.2 B	1.0 B	1.2 B
VANADIUM	28.2 J					13.7	15.0
ZINC	25.0					91.2	85.1

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-04-AVG	W-TR03-05	W-TR03-06	W-TR03-07	W-TR03-08	W-TR03-09	W-TR03-10
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated						
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
2-BUTANONE	10 U	10 U			10 U	10 U	
2-CHLOROETHYL VINYL ETHER			10 UJ	10 U			10 U
2-HEXANONE	10 U	10 U			10 U	10 U	
4-METHYL-2-PENTANONE	10 U	10 U			10 U	10 U	
ACETONE	10 U	10 U			10 U	10 U	
BENZENE	5 U	5 U			5 U	5 U	
BROMODICHLOROMETHANE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U
CARBON DISULFIDE	5 U	5 U			5 U	5 U	
CARBON TETRACHLORIDE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
ETHYLBENZENE	5 U	5 U			5 U	5 U	
METHYLENE CHLORIDE	3 B	4 B	3 B	3 B	4 B	3 B	3 B
STYRENE	5 U	5 U			5 U	5 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-04-AVG	W-TR03-05	W-TR03-06	W-TR03-07	W-TR03-08	W-TR03-09	W-TR03-10
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated						
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
TOLUENE	5 U	5 U			5 U	5 U	
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE			5 UJ	5 U			5 U
VINYL ACETATE	10 U	10 U			10 U	10 U	
VINYL CHLORIDE	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U
XYLENES, TOTAL	15 U	15 U			15 U	15 U	
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE	330 U	330 U			330 U	330 U	
1,2-DICHLOROBENZENE	330 U	330 U	5 UJ	5 U	330 U	330 U	5 U
1,3-DICHLOROBENZENE	330 U	330 U	5 UJ	5 U	330 U	330 U	5 U
1,4-DICHLOROBENZENE	330 U	330 U	5 UJ	5 U	330 U	330 U	5 U
2,4,5-TRICHLOROPHENOL	800 U	800 U			800 U	800 U	
2,4,6-TRICHLOROPHENOL	330 U	330 U			330 U	330 U	
2,4-DICHLOROPHENOL	330 U	330 U			330 U	330 U	
2,4-DIMETHYLPHENOL	330 U	330 U			330 U	330 U	
2,4-DINITROPHENOL	1600 U	1600 U			1600 U	1600 U	
2-CHLORONAPHTHALENE	330 U	330 U			330 U	330 U	
2-CHLOROPHENOL	330 U	330 U			330 U	330 U	
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL	330 U	330 U			330 U	330 U	
2-NITROANILINE	1600 U	1600 U			1600 U	1600 U	
2-NITROPHENOL	330 U	330 U			330 U	330 U	
3,3'-DICHLOROBENZIDINE	660 U	660 U			660 U	660 U	
3-NITROANILINE	1600 U	1600 U			1600 U	1600 U	
4,6-DINITRO-2-METHYLPHENOL	1600 U	1600 U			1600 U	1600 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-04-AVG	W-TR03-05	W-TR03-06	W-TR03-07	W-TR03-08	W-TR03-09	W-TR03-10
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated						
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER	330 U	330 U			330 U	330 U	
4-CHLORO-3-METHYLPHENOL	330 U	330 U			330 U	330 U	
4-CHLOROANILINE	330 U	330 U			330 U	330 U	
4-CHLOROPHENYL PHENYL ETHER	330 U	330 U			330 U	330 U	
4-METHYLPHENOL	330 U	330 U			330 U	330 U	
4-NITROANILINE	1600 U	1600 U			1600 U	1600 U	
4-NITROPHENOL	1600 U	1600 U			1600 U	1600 U	
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	65 J	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	84 J	330 U	330 U	60 J	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	25 J	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZOIC ACID	1600 U	1600 U			1600 U	1600 U	
BENZYL ALCOHOL	330 U	330 U			330 U	330 U	
BIS(2-CHLOROETHOXY)METHANE	330 U	330 U			330 U	330 U	
BIS(2-CHLOROETHYL)ETHER	330 U	330 U			330 U	330 U	
BIS(2-CHLOROISOPROPYL) ETHER	330 U	330 U			330 U	330 U	
BIS(2-ETHYLHEXYL)PHTHALATE	330 U	330 U			330 U	330 U	
BUTYLBENZYL PHTHALATE	330 U	330 U			330 U	330 U	
CHRYSENE	330 U	330 U	64 J	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE	330 U	330 U			330 U	330 U	
DI-N-OCTYL PHTHALATE	330 U	330 U			330 U	330 U	
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZOFURAN	330 U	330 U			330 U	330 U	
DIETHYL PHTHALATE	330 U	330 U			330 U	330 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-04-AVG	W-TR03-05	W-TR03-06	W-TR03-07	W-TR03-08	W-TR03-09	W-TR03-10
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated						
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE	330 U	330 U			330 U	330 U	
FLUORANTHENE	330 U	330 U	100 J	330 U	330 U	100 J	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE	330 U	330 U			330 U	330 U	
HEXACHLOROBUTADIENE	330 U	330 U			330 U	330 U	
HEXACHLOROCYCLOPENTADIENE	330 U	330 U			330 U	330 U	
HEXACHLOROETHANE	330 U	330 U			330 U	330 U	
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ISOPHORONE	330 U	330 U			330 U	330 U	
N-NITROSO-DI-N-PROPYLAMINE	330 U	330 U			330 U	330 U	
N-NITROSODIPHENYLAMINE	330 U	330 U			330 U	330 U	
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL	1600 U	1600 U			1600 U	1600 U	
PHENANTHRENE	330 U	330 U	52 J	330 U	330 U	26 J	330 U
PHENOL	330 U	330 U			330 U	330 U	
PYRENE	330 U	330 U	130 J	330 U	330 U	120 J	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD	16 U	16.0 U			16.0 U	16.0 U	
4,4'-DDE	16 U	16.0 U			16.0 U	16.0 U	
4,4'-DDT	16 U	16.0 U			16.0 U	16.0 U	
ALDRIN	8.0 U	8.0 U			8.0 U	8.0 U	
ALPHA-BHC	8.0 U	8.0 U			8.0 U	8.0 U	
AROCLOR-1016	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U
AROCLOR-1221	80.0 U	80.0 U	80 U	80 U	80.0 U	80.0 U	80 U
AROCLOR-1232	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U
AROCLOR-1242	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U
AROCLOR-1248	40.0 U	40.0 U	36 J	40 U	40.0 U	40.0 U	40 U
AROCLOR-1254	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-04-AVG	W-TR03-05	W-TR03-06	W-TR03-07	W-TR03-08	W-TR03-09	W-TR03-10
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated						
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U
BETA-BHC	8 U	8.0 U			8.0 U	8.0 U	
CHLORDANE	80.0 U	80.0 U			80.0 U	80.0 U	
DELTA-BHC	8.0 U	8.0 U			8.0 U	8.0 U	
DIELDRIN	16.0 U	16.0 U			16.0 U	16.0 U	
ENDOSULFAN I	16.0 U	16.0 U			16.0 U	16.0 U	
ENDOSULFAN II	16.0 U	16.0 U			16.0 U	16.0 U	
ENDOSULFAN SULFATE	16.0 U	16.0 U			16.0 U	16.0 U	
ENDRIN	16.0 U	16.0 U			16.0 U	16.0 U	
ENDRIN ALDEHYDE	32.0 U	32.0 U			32.0 U	32.0 U	
GAMMA-BHC (LINDANE)	8.0 U	8.0 U			8.0 U	8.0 U	
HEPTACHLOR	8.0 U	8.0 U			8.0 U	8.0 U	
HEPTACHLOR EPOXIDE	8.0 U	8.0 U			8.0 U	8.0 U	
METHOXYCHLOR	80.0 U	80.0 U			80.0 U	80.0 U	
TOXAPHENE	160 U	160 U			160 U	160 U	
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE	330 U	330 U			330 U	330 U	
2,6-DINITROTOLUENE	330 U	330 U			330 U	330 U	
NITROBENZENE	330 U	330 U			330 U	330 U	
METALS (mg/kg)							
ALUMINUM	9555 L	7580 L			7290 L	8820 L	
ANTIMONY	0.87 B	1.2 B			1.0 B	0.65 UJ	
ARSENIC	0.26 J	1.3 J			2.7 L	3.1 L	
BARIUM	102 L	90.4 L			54.4 L	102 L	
BERYLLIUM	2.3	1.3			0.65	1.2	
CADMIUM	0.04 UL	0.03 UL			0.03 UL	0.03 UL	
CALCIUM	4020 J	1900 J			1220 J	1170 J	
CHROMIUM	15.95	12.8 L			13.2 L	16.9	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-04-AVG	W-TR03-05	W-TR03-06	W-TR03-07	W-TR03-08	W-TR03-09	W-TR03-10
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated						
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT	11.5	11.7			5.9 K	5.9 K	
COPPER	20.5	27.5			17.7	12.6	
IRON	17900 L	17400 L			14900 L	17000 L	
LEAD	10.35 K	10.1 K			10.4 K	7.6 K	
MAGNESIUM	6360	3180			1760	2410	
MANGANESE	205.5	707			275	167	
MERCURY	0.04 U	0.04 U			0.04 U	0.04 U	
NICKEL	23.1	13.3			8.0	11.4	
POTASSIUM	2985	1420			479 K	535 K	
SELENIUM	0.93 K	1.3 K			0.93 J	0.79 J	
SILVER	0.29 U	0.29 UL			0.29 UL	0.28 UL	
SODIUM	136 B	133 B			118 B	144 B	
THALLIUM	1.1 B	1.2	0.91 B	0.75 B	0.72 B	0.98 B	0.67 B
VANADIUM	14.35	16.0			22.6	27.1	
ZINC	88.15	43.4			59.9	34.4	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-11	W-TR03-12	W-TR03-24	W-TR03-12-AVG	W-TR03-13	W-TR03-23	W-TR03-13-AVG
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:							
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:			W-TR03-12			W-TR03-13	
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-CHLOROETHYL VINYL ETHER	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
METHYLENE CHLORIDE	3 B	3 B	3 B	3 B	2 B	4 B	3 B
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
SEMIVOLATILES (µg/kg)							
1,2-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-11	W-TR03-12	W-TR03-24	W-TR03-12-AVG	W-TR03-13	W-TR03-23	W-TR03-13-AVG
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:							
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:			W-TR03-12			W-TR03-13	
SEMIVOLATILES (µg/kg)							
1,3-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1016	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1221	80 U	80 U	80 U	80 U	80 U	80 U	80 U
AROCLOR-1232	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1242	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1248	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1254	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1260	40 U	40 U	40 U	40 U	40 U	40 U	40 U
METALS (mg/kg)							

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-11	W-TR03-12	W-TR03-24	W-TR03-12-AVG	W-TR03-13	W-TR03-23	W-TR03-13-AVG
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:							
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:			W-TR03-12			W-TR03-13	
METALS (mg/kg)							
THALLIUM	1.0 B	1.0 B	1.6 B	1.3 B	1.0 B	1.0 B	1.0 B

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-14	W-TR03-15	W-TR03-16	W-TR03-17	W-TR03-18	W-TR03-19	W-TR03-20
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated				Excavated		
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE	10 U	10 U			10 U	10 U	
2-CHLOROETHYL VINYL ETHER			10 U	10 U			10 U
2-HEXANONE	10 U	10 U			10 U	10 U	
4-METHYL-2-PENTANONE	10 U	10 U			10 U	10 U	
ACETONE	10 U	10 U			10 U	10 U	
BENZENE	5 U	5 U			5 U	5 U	
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	0.3 J	10 U	10 U
CARBON DISULFIDE	5 U	5 U			5 U	5 U	
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	5 U	5 U			5 U	5 U	
METHYLENE CHLORIDE	3 B	4 B	4 B	3 B	3 B	4 B	4 B
STYRENE	5 U	5 U			5 U	5 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-14	W-TR03-15	W-TR03-16	W-TR03-17	W-TR03-18	W-TR03-19	W-TR03-20
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated				Excavated		
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	5 U	5 U			5 U	5 U	
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE			5 U	5 U			5 U
VINYL ACETATE	10 U	10 U			10 U	10 U	
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL	15 U	15 U			15 U	15 U	
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE	330 U	330 U			330 U	330 U	
1,2-DICHLOROBENZENE	330 U	330 U	5 U	5 U	330 U	330 U	5 U
1,3-DICHLOROBENZENE	330 U	330 U	5 U	5 U	330 U	330 U	5 U
1,4-DICHLOROBENZENE	330 U	330 U	5 U	5 U	330 U	330 U	5 U
2,4,5-TRICHLOROPHENOL	800 U	800 U			800 U	800 U	
2,4,6-TRICHLOROPHENOL	330 U	330 U			330 U	330 U	
2,4-DICHLOROPHENOL	330 U	330 U			330 U	330 U	
2,4-DIMETHYLPHENOL	330 U	330 U			330 U	330 U	
2,4-DINITROPHENOL	1600 U	1600 U			1600 U	1600 U	
2-CHLORONAPHTHALENE	330 U	330 U			330 U	330 U	
2-CHLOROPHENOL	330 U	330 U			330 U	330 U	
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL	330 U	330 U			330 U	330 U	
2-NITROANILINE	1600 U	1600 U			1600 U	1600 U	
2-NITROPHENOL	330 U	330 U			330 U	330 U	
3,3'-DICHLOROBENZIDINE	660 U	660 U			660 U	660 U	
3-NITROANILINE	1600 U	1600 U			1600 U	1600 U	
4,6-DINITRO-2-METHYLPHENOL	1600 U	1600 U			1600 U	1600 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-14	W-TR03-15	W-TR03-16	W-TR03-17	W-TR03-18	W-TR03-19	W-TR03-20
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated				Excavated		
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER	330 U	330 U			330 U	330 U	
4-CHLORO-3-METHYLPHENOL	330 U	330 U			330 U	330 U	
4-CHLOROANILINE	330 U	330 U			330 U	330 U	
4-CHLOROPHENYL PHENYL ETHER	330 U	330 U			330 U	330 U	
4-METHYLPHENOL	330 U	330 U			330 U	330 U	
4-NITROANILINE	1600 U	1600 U			1600 U	1600 U	
4-NITROPHENOL	1600 U	1600 U			1600 U	1600 U	
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZOIC ACID	1600 U	1600 U			1600 U	1600 U	
BENZYL ALCOHOL	330 U	330 U			330 U	330 U	
BIS(2-CHLOROETHOXY)METHANE	330 U	330 U			330 U	330 U	
BIS(2-CHLOROETHYL)ETHER	330 U	330 U			330 U	330 U	
BIS(2-CHLOROISOPROPYL) ETHER	330 U	330 U			330 U	330 U	
BIS(2-ETHYLHEXYL)PHTHALATE	330 U	330 U			330 U	330 U	
BUTYLBENZYL PHTHALATE	330 U	330 U			330 U	330 U	
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE	330 U	330 U			330 U	330 U	
DI-N-OCTYL PHTHALATE	330 U	330 U			330 U	330 U	
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZOFURAN	330 U	330 U			330 U	330 U	
DIETHYL PHTHALATE	330 U	330 U			330 U	330 U	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-14	W-TR03-15	W-TR03-16	W-TR03-17	W-TR03-18	W-TR03-19	W-TR03-20
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated				Excavated		
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE	330 U	330 U			330 U	330 U	
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE	330 U	330 U			330 U	330 U	
HEXACHLOROBUTADIENE	330 U	330 U			330 U	330 U	
HEXACHLOROCYCLOPENTADIENE	330 U	330 U			330 U	330 U	
HEXACHLOROETHANE	330 U	330 U			330 U	330 U	
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ISOPHORONE	330 U	330 U			330 U	330 U	
N-NITROSO-DI-N-PROPYLAMINE	330 U	330 U			330 U	330 U	
N-NITROSODIPHENYLAMINE	330 U	330 U			330 U	330 U	
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL	1600 U	1600 U			1600 U	1600 U	
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENOL	330 U	330 U			330 U	330 U	
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD	16.0 U	16.0 U			16.0 U	16.0 U	
4,4'-DDE	16.0 U	16.0 U			16.0 U	16.0 U	
4,4'-DDT	16.0 U	16.0 U			16.0 U	16.0 U	
ALDRIN	8.0 U	8.0 U			8.0 U	8.0 U	
ALPHA-BHC	8.0 U	8.0 U			8.0 U	8.0 U	
AROCLOR-1016	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U
AROCLOR-1221	80.0 U	80.0 U	80 U	80 U	80.0 U	80.0 U	80 U
AROCLOR-1232	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U
AROCLOR-1242	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U
AROCLOR-1248	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U
AROCLOR-1254	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-14	W-TR03-15	W-TR03-16	W-TR03-17	W-TR03-18	W-TR03-19	W-TR03-20
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated				Excavated		
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U	40 U
BETA-BHC	8.0 U	8.0 U			8.0 U	8.0 U	
CHLORDANE	80.0 U	80.0 U			80.0 U	80.0 U	
DELTA-BHC	8.0 U	8.0 U			8.0 U	8.0 U	
DIELDRIN	16.0 U	16.0 U			16.0 U	16.0 U	
ENDOSULFAN I	16.0 U	16.0 U			16.0 U	16.0 U	
ENDOSULFAN II	16.0 U	16.0 U			16.0 U	16.0 U	
ENDOSULFAN SULFATE	16.0 U	16.0 U			16.0 U	16.0 U	
ENDRIN	16.0 U	16.0 U			16.0 U	16.0 U	
ENDRIN ALDEHYDE	32.0 U	32.0 U			32.0 U	32.0 U	
GAMMA-BHC (LINDANE)	8.0 U	8.0 U			8.0 U	8.0 U	
HEPTACHLOR	8.0 U	8.0 U			8.0 U	8.0 U	
HEPTACHLOR EPOXIDE	8.0 U	8.0 U			8.0 U	8.0 U	
METHOXYCHLOR	80.0 U	80.0 U			80.0 U	80.0 U	
TOXAPHENE	160 U	160 U			160 U	160 U	
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE	330 U	330 U			330 U	330 U	
2,6-DINITROTOLUENE	330 U	330 U			330 U	330 U	
NITROBENZENE	330 U	330 U			330 U	330 U	
METALS (mg/kg)							
ALUMINUM	7420 L	7200 L			4960 L	7440 L	
ANTIMONY	0.72 B	0.67 UJ			1.2 B	0.66 UJ	
ARSENIC	0.33 UJ	2.9 K			1.3 J	2.7 K	
BARIUM	116 L	97.4 L			179 L	62.9 L	
BERYLLIUM	2.1	1.3			1.3	0.74	
CADMIUM	0.04 UL	0.04 UL			0.04 U	0.03 UL	
CALCIUM	2210 J	1250 J			2520 J	849 J	
CHROMIUM	13.4	17.2			8.3	16.3	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-14	W-TR03-15	W-TR03-16	W-TR03-17	W-TR03-18	W-TR03-19	W-TR03-20
SAMPLE DATE:	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96	08/26/96
STATUS:	Excavated				Excavated		
TRENCH:	3	3	3	3	3	3	3
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT	12.5	6.2 K			11.1	8.7 K	
COPPER	4.8 J	10.0			7.8	10.8	
IRON	14900 L	18500 L			12000 L	17200 L	
LEAD	12.0 K	7.6 K			7.6	7.5 K	
MAGNESIUM	3960	2440			1060	2490	
MANGANESE	271	214			3020	242	
MERCURY	0.04 U	0.04 U			0.04 U	0.04 U	
NICKEL	16.9	12.1			11.3	10.6	
POTASSIUM	2830	579 K			262 K	581 K	
SELENIUM	0.76 J	1.1 K			1.9	0.86 J	
SILVER	0.29 UL	0.29 UL			0.30 UL	0.29 UL	
SODIUM	163 B	110 B			180 B	66.2 UL	
THALLIUM	0.94 B	0.95 B	0.76 B	0.74 B	1.3 B	1.0 B	0.83 B
VANADIUM	12.1	31.6			16.0	29.7	
ZINC	53.1	44.1			20.1	31.5	

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-21	W-TR03-22	W-TR04-00	W-TR04-01	W-TR04-00-AVG	W-TR04-00R	W-TR04-02
SAMPLE DATE:	08/26/96	08/26/96	10/30/96	10/30/96	10/30/96	11/20/96	10/30/96
STATUS:			Excavated	Excavated	Excavated		
TRENCH:	3	3	4	4	4	4	4
FIELD DUPLICATE OF:				W-TR04-00			
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U		5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U		5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U		5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U		5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U		5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U		5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U		5 U
2-BUTANONE			10 U	10 U	10 U		
2-CHLOROETHYL VINYL ETHER	10 U	10 U					10 UJ
2-HEXANONE			10 U	10 U	10 U		
4-METHYL-2-PENTANONE			10 U	10 U	10 U		
ACETONE			10 U	10 U	10 U		
BENZENE			5 U	5 U	5 U		
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U		5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U		5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U		10 U
CARBON DISULFIDE			5 U	5 U	5 U		
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U		5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U		5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U		10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U		5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U		10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U		5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U		5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U		5 U
ETHYLBENZENE			5 U	5 U	5 U		
METHYLENE CHLORIDE	4 B	4 B	5 U	5 U	5 U		5 U
STYRENE			5 U	5 U	5 U		

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-21	W-TR03-22	W-TR04-00	W-TR04-01	W-TR04-00-AVG	W-TR04-00R	W-TR04-02
SAMPLE DATE:	08/26/96	08/26/96	10/30/96	10/30/96	10/30/96	11/20/96	10/30/96
STATUS:			Excavated	Excavated	Excavated		
TRENCH:	3	3	4	4	4	4	4
FIELD DUPLICATE OF:				W-TR04-00			
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U		5 U
TOLUENE			5 U	5 U	5 U		
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U		5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U		5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U		5 U
TRICHLOROFLUOROMETHANE	5 U	5 U					5 U
VINYL ACETATE			10 U	10 U	10 U		
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U		10 U
XYLENES, TOTAL			15 U	15 U	15 U		
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE			330 U	330 U	330 U		
1,2-DICHLOROBENZENE	5 U	5 U	330 U	330 U	330 U		5 U
1,3-DICHLOROBENZENE	5 U	5 U	330 U	330 U	330 U		5 U
1,4-DICHLOROBENZENE	5 U	5 U	330 U	330 U	330 U		5 U
2,4,5-TRICHLOROPHENOL			800 U	800 U	800 U		
2,4,6-TRICHLOROPHENOL			330 U	330 U	330 U		
2,4-DICHLOROPHENOL			330 U	330 U	330 U		
2,4-DIMETHYLPHENOL			330 U	330 U	330 U		
2,4-DINITROPHENOL			1600 UJ	1600 UJ	1600 U		
2-CHLORONAPHTHALENE			330 U	330 U	330 U		
2-CHLOROPHENOL			330 U	330 U	330 U		
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U		330 U
2-METHYLPHENOL			330 U	330 U	330 U		
2-NITROANILINE			1600 U	1600 U	1600 U		
2-NITROPHENOL			330 U	330 U	330 U		
3,3'-DICHLOROBENZIDINE			660 U	660 U	660 U		
3-NITROANILINE			1600 U	1600 U	1600 U		
4,6-DINITRO-2-METHYLPHENOL			1600 U	1600 U	1600 U		

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-21	W-TR03-22	W-TR04-00	W-TR04-01	W-TR04-00-AVG	W-TR04-00R	W-TR04-02
SAMPLE DATE:	08/26/96	08/26/96	10/30/96	10/30/96	10/30/96	11/20/96	10/30/96
STATUS:			Excavated	Excavated	Excavated		
TRENCH:	3	3	4	4	4	4	4
FIELD DUPLICATE OF:				W-TR04-00			
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER			330 U	330 U	330 U		
4-CHLORO-3-METHYLPHENOL			330 U	330 U	330 U		
4-CHLOROANILINE			330 U	330 U	330 U		
4-CHLOROPHENYL PHENYL ETHER			330 U	330 U	330 U		
4-METHYLPHENOL			330 U	330 U	330 U		
4-NITROANILINE			1600 U	1600 U	1600 U		
4-NITROPHENOL			1600 U	1600 U	1600 U		
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U		330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U		330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U		330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U		330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U		330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U		330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U		330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U		330 U
BENZOIC ACID			1600 U	1600 U	1600 U		
BENZYL ALCOHOL			330 U	330 U	330 U		
BIS(2-CHLOROETHOXY)METHANE			330 U	330 U	330 U		
BIS(2-CHLOROETHYL)ETHER			330 U	330 U	330 U		
BIS(2-CHLOROISOPROPYL) ETHER			330 U	330 U	330 U		
BIS(2-ETHYLHEXYL)PHTHALATE			200 J	330 U	200 J		
BUTYLBENZYL PHTHALATE			330 U	330 U	330 U		
CHRYSENE	330 U	330 U	330 U	330 U	330 U		330 U
DI-N-BUTYL PHTHALATE			330 U	330 U	330 U		
DI-N-OCTYL PHTHALATE			330 U	330 U	330 U		
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U		330 U
DIBENZOFURAN			330 U	330 U	330 U		
DIETHYL PHTHALATE			330 U	330 U	330 U		

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-21	W-TR03-22	W-TR04-00	W-TR04-01	W-TR04-00-AVG	W-TR04-00R	W-TR04-02
SAMPLE DATE:	08/26/96	08/26/96	10/30/96	10/30/96	10/30/96	11/20/96	10/30/96
STATUS:			Excavated	Excavated	Excavated		
TRENCH:	3	3	4	4	4	4	4
FIELD DUPLICATE OF:				W-TR04-00			
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE			330 U	330 U	330 U		
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U		330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U		330 U
HEXACHLOROBENZENE			330 U	330 U	330 U		
HEXACHLOROBUTADIENE			330 U	330 U	330 U		
HEXACHLOROCYCLOPENTADIENE			330 U	330 U	330 U		
HEXACHLOROETHANE			330 U	330 U	330 U		
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U		330 U
ISOPHORONE			330 U	330 U	330 U		
N-NITROSO-DI-N-PROPYLAMINE			330 U	330 U	330 U		
N-NITROSODIPHENYLAMINE			330 U	330 U	330 U		
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U		330 U
PENTACHLOROPHENOL			1600 U	1600 U	1600 U		
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U		330 U
PHENOL			330 U	330 U	330 U		
PYRENE	330 U	330 U	330 U	330 U	330 U		330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD			16.0 U	16.0 U	16 U		
4,4'-DDE			16.0 U	16.0 U	16 U		
4,4'-DDT			16.0 U	16.0 U	16 U		
ALDRIN			8.0 U	8.0 U	8 U		
ALPHA-BHC			8.0 U	8.0 U	8 U		
AROCLOR-1016	40 U	40 U	40.0 U	40.0 U	40 U		40 U
AROCLOR-1221	80 U	80 U	80.0 U	80.0 U	80 U		80 U
AROCLOR-1232	40 U	40 U	40.0 U	40.0 U	40 U		40 U
AROCLOR-1242	40 U	40 U	40.0 U	40.0 U	40 U		40 U
AROCLOR-1248	40 U	40 U	40.0 U	40.0 U	40 U		40 U
AROCLOR-1254	40 U	40 U	40.0 U	40.0 U	40 U		40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-21	W-TR03-22	W-TR04-00	W-TR04-01	W-TR04-00-AVG	W-TR04-00R	W-TR04-02
SAMPLE DATE:	08/26/96	08/26/96	10/30/96	10/30/96	10/30/96	11/20/96	10/30/96
STATUS:			Excavated	Excavated	Excavated		
TRENCH:	3	3	4	4	4	4	4
FIELD DUPLICATE OF:				W-TR04-00			
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40 U	40.0 U	40.0 U	40 U		40 U
BETA-BHC			8.0 U	8.0 U	8 U		
CHLORDANE			80.0 U	80.0 U	80 U		
DELTA-BHC			8.0 U	8.0 U	8 U		
DIELDRIN			16.0 U	16.0 U	16 U		
ENDOSULFAN I			16.0 U	16.0 U	16 U		
ENDOSULFAN II			16.0 U	16.0 U	16 U		
ENDOSULFAN SULFATE			16.0 U	16.0 U	16 U		
ENDRIN			16.0 U	16.0 U	16 U		
ENDRIN ALDEHYDE			32.0 U	32.0 U	32 U		
GAMMA-BHC (LINDANE)			8.0 U	8.0 U	8 U		
HEPTACHLOR			8.0 U	8.0 U	8 U		
HEPTACHLOR EPOXIDE			8.0 U	8.0 U	8 U		
METHOXYCHLOR			80.0 U	80.0 U	80 U		
TOXAPHENE			160 U	160 U	160 U		
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE			330 U	330 U	330 U		
2,6-DINITROTOLUENE			330 U	330 U	330 U		
NITROBENZENE			330 U	330 U	330 U		
METALS (mg/kg)							
ALUMINUM			18700	17600	18150	10900	
ANTIMONY			0.65 U	0.66 U	0.66 U		
ARSENIC			7.9 K	9.9 K	8.9 K		
BARIUM			61.2	49.1	55.15		
BERYLLIUM			0.69 J	0.59 J	0.64 J		
CADMIUM			0.03 UL	0.03 UL	0.03 U		
CALCIUM			503	531	517		
CHROMIUM			24.5	28.6	26.55		

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR03-21	W-TR03-22	W-TR04-00	W-TR04-01	W-TR04-00-AVG	W-TR04-00R	W-TR04-02
SAMPLE DATE:	08/26/96	08/26/96	10/30/96	10/30/96	10/30/96	11/20/96	10/30/96
STATUS:			Excavated	Excavated	Excavated		
TRENCH:	3	3	4	4	4	4	4
FIELD DUPLICATE OF:				W-TR04-00			
METALS (mg/kg)							
COBALT			6.2	5.6 B	4.5		
COPPER			9.0	11.2	10.1		
IRON			22000	26400	24200		
LEAD			8.8	9.3	9.05		
MAGNESIUM			2310	2460	2385		
MANGANESE			149 K	92.7 K	120.85 K		
MERCURY			0.04 U	0.04 U	0.04 U		
NICKEL			13.1	11.5	12.3		
POTASSIUM			1020	1010	1015		
SELENIUM			2.1	2.0	2.05		
SILVER			0.29 UL	0.29 UL	0.29 U		
SODIUM			324 B	314 B	319 B		
THALLIUM	1.7	0.80 B	2.0 B	2.3 B	2.15 B		1.4 B
VANADIUM			37.1	42.7	39.9		
ZINC			34.3	34.9	34.6		

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-03	W-TR04-04	W-TR04-05	W-TR04-06	W-TR04-07	W-TR04-08	W-TR04-09
SAMPLE DATE:	10/30/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:		Excavated					
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE	10 U	10 U	10 U			10 U	10 U
2-CHLOROETHYL VINYL ETHER				10 U	10 U		
2-HEXANONE	10 U	10 U	10 U			10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U			10 U	10 U
ACETONE	10 U	10 U	10 U			10 U	8 J
BENZENE	5 U	5 U	5 U			5 U	5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE	5 U	5 U	5 U			5 U	5 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	1 J	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	5 U	5 U	5 U			3 J	5 U
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
STYRENE	5 U	5 U	5 U			5 U	5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-03	W-TR04-04	W-TR04-05	W-TR04-06	W-TR04-07	W-TR04-08	W-TR04-09
SAMPLE DATE:	10/30/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:		Excavated					
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	5 U	74	3 B			140	2 B
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE				5 U	5 U		
VINYL ACETATE	10 U	10 U	10 U			10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL	15 U	12	15 U			23	15 U
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE	330 U	330 U	330 U			330 U	330 U
1,2-DICHLOROBENZENE	330 U	330 U	330 U	5 U	5 U	330 U	330 U
1,3-DICHLOROBENZENE	330 U	330 U	330 U	5 U	5 U	330 U	330 U
1,4-DICHLOROBENZENE	330 U	330 U	330 U	5 U	5 U	330 U	330 U
2,4,5-TRICHLOROPHENOL	800 U	800 U	800 U			800 U	800 U
2,4,6-TRICHLOROPHENOL	330 U	330 U	330 U			330 U	330 U
2,4-DICHLOROPHENOL	330 U	330 U	330 U			330 U	330 U
2,4-DIMETHYLPHENOL	330 U	330 U	330 U			330 U	330 U
2,4-DINITROPHENOL	1600 UJ	1600 UJ	1600 UJ			1600 UJ	1600 UJ
2-CHLORONAPHTHALENE	330 U	330 U	330 U			330 U	330 U
2-CHLOROPHENOL	330 U	330 U	330 U			330 U	330 U
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL	330 U	330 U	330 U			330 U	330 U
2-NITROANILINE	1600 U	1600 U	1600 U			1600 U	1600 U
2-NITROPHENOL	330 U	330 U	330 U			330 U	330 U
3,3'-DICHLOROBENZIDINE	660 U	660 U	660 U			660 U	660 U
3-NITROANILINE	1600 U	1600 U	1600 U			1600 U	1600 U
4,6-DINITRO-2-METHYLPHENOL	1600 U	1600 U	1600 U			1600 U	1600 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-03	W-TR04-04	W-TR04-05	W-TR04-06	W-TR04-07	W-TR04-08	W-TR04-09
SAMPLE DATE:	10/30/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:		Excavated					
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER	330 U	330 U	330 U			330 U	330 U
4-CHLORO-3-METHYLPHENOL	330 U	330 U	330 U			330 U	330 U
4-CHLOROANILINE	330 U	330 U	330 U			330 U	330 U
4-CHLOROPHENYL PHENYL ETHER	330 U	330 U	330 U			330 U	330 U
4-METHYLPHENOL	330 U	330 U	330 U			330 U	330 U
4-NITROANILINE	1600 U	1600 U	1600 U			1600 U	1600 U
4-NITROPHENOL	1600 U	1600 U	1600 U			1600 U	1600 U
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	170 J	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	180 J	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	210 J	330 U	330 U	330 U	330 U	25 J	330 U
BENZO(G,H,I)PERYLENE	110 J	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	86 J	330 U	330 U	330 U	330 U	12 J	330 U
BENZOIC ACID	1600 U	1600 U	1600 U			1600 U	1600 U
BENZYL ALCOHOL	330 U	330 U	330 U			330 U	330 U
BIS(2-CHLOROETHOXY)METHANE	330 U	330 U	330 U			330 U	330 U
BIS(2-CHLOROETHYL)ETHER	330 U	330 U	330 U			330 U	330 U
BIS(2-CHLOROISOPROPYL) ETHER	330 U	330 U	330 U			330 U	330 U
BIS(2-ETHYLHEXYL)PHTHALATE	460	84 J	330 U			180 J	510
BUTYLBENZYL PHTHALATE	330 U	330 U	330 U			330 U	330 U
CHRYSENE	200 J	330 U	330 U	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE	330 U	330 U	330 U			330 U	330 U
DI-N-OCTYL PHTHALATE	330 U	330 U	330 U			330 U	330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZOFURAN	330 U	330 U	330 U			330 U	330 U
DIETHYL PHTHALATE	330 U	330 U	330 U			330 U	330 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-03	W-TR04-04	W-TR04-05	W-TR04-06	W-TR04-07	W-TR04-08	W-TR04-09
SAMPLE DATE:	10/30/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:		Excavated					
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE	330 U	330 U	330 U			330 U	330 U
FLUORANTHENE	290 J	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE	330 U	330 U	330 U			330 U	330 U
HEXACHLOROBUTADIENE	330 U	330 U	330 U			330 U	330 U
HEXACHLOROCYCLOPENTADIENE	330 U	330 U	330 U			330 U	330 U
HEXACHLOROETHANE	330 U	330 U	330 U			330 U	330 U
INDENO(1,2,3-CD)PYRENE	120 J	330 U	330 U	330 U	330 U	330 U	330 U
ISOPHORONE	330 U	330 U	330 U			330 U	330 U
N-NITROSO-DI-N-PROPYLAMINE	330 U	330 U	330 U			330 U	330 U
N-NITROSODIPHENYLAMINE	330 U	330 U	330 U			330 U	330 U
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL	1600 U	1600 U	1600 U			1600 U	1600 U
PHENANTHRENE	93 J	330 U	330 U	330 U	330 U	330 U	330 U
PHENOL	330 U	330 U	330 U			330 U	330 U
PYRENE	330	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD	16.0 U	16.0 U	16.0 U			16.0 U	16.0 U
4,4'-DDE	16.0 U	16.0 U	16.0 U			16.0 U	16.0 U
4,4'-DDT	16.0 U	16.0 U	16.0 U			16.0 U	16.0 U
ALDRIN	8.0 U	8.0 U	8.0 U			8.0 U	8.0 U
ALPHA-BHC	8.0 U	8.0 U	8.0 U			8.0 U	8.0 U
AROCLOR-1016	40.0 U	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1221	80.0 U	80.0 U	80.0 U	80 U	80 U	80.0 U	80.0 U
AROCLOR-1232	40.0 U	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1242	40.0 U	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1248	40.0 U	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1254	40.0 U	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-03	W-TR04-04	W-TR04-05	W-TR04-06	W-TR04-07	W-TR04-08	W-TR04-09
SAMPLE DATE:	10/30/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:		Excavated					
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40.0 U	40.0 U	40.0 U	40 U	40 U	40.0 U	40.0 U
BETA-BHC	8.0 U	8.0 U	8.0 U			8.0 U	8.0 U
CHLORDANE	80.0 U	80.0 U	80.0 U			80.0 U	80.0 U
DELTA-BHC	8.0 U	8.0 U	8.0 U			8.0 U	8.0 U
DIELDRIN	16.0 U	16.0 U	16.0 U			16.0 U	16.0 U
ENDOSULFAN I	16.0 U	16.0 U	16.0 U			16.0 U	16.0 U
ENDOSULFAN II	16.0 U	16.0 U	16.0 U			16.0 U	16.0 U
ENDOSULFAN SULFATE	16.0 U	16.0 U	16.0 U			16.0 U	16.0 U
ENDRIN	16.0 U	16.0 U	16.0 U			16.0 U	16.0 U
ENDRIN ALDEHYDE	32.0 U	32.0 U	32.0 U			32.0 U	32.0 U
GAMMA-BHC (LINDANE)	8.0 U	8.0 U	8.0 U			8.0 U	8.0 U
HEPTACHLOR	8.0 U	8.0 U	8.0 U			8.0 U	8.0 U
HEPTACHLOR EPOXIDE	8.0 U	8.0 U	8.0 U			8.0 U	8.0 U
METHOXYCHLOR	2.6 J	80.0 U	80.0 U			80.0 U	80.0 U
TOXAPHENE	160 U	160 U	160 U			160 U	160 U
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE	330 U	330 U	330 U			330 U	330 U
2,6-DINITROTOLUENE	330 U	330 U	330 U			330 U	330 U
NITROBENZENE	330 U	330 U	330 U			330 U	330 U
METALS (mg/kg)							
ALUMINUM	11000	6820	10900			8650	5890
ANTIMONY	0.63 U	0.67 U	0.64 U			0.66 U	0.64 U
ARSENIC	4.6 K	2.4	5.4 K			5.0 K	9.1 K
BARIUM	55.5	125 J	42.8 J			93.8 J	53.8 J
BERYLLIUM	0.92 J	1.8	0.76			1.0	0.61 B
CADMIUM	0.03 UL	0.05 U	0.04 UL			0.04 UL	0.04 UL
CALCIUM	34400	2400 J	438 J			1680 J	890 J
CHROMIUM	16.8	9.6 J	16.4 J			15.7 J	16.7 J

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-03	W-TR04-04	W-TR04-05	W-TR04-06	W-TR04-07	W-TR04-08	W-TR04-09
SAMPLE DATE:	10/30/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:		Excavated					
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT	8.7	11.9	13.3			10.8	1.8 L
COPPER	13.0	3.0	13.4			9.6	6.9
IRON	17600	9410	18000			16400	15800
LEAD	8.3	14.2	6.7			14.0	7.2
MAGNESIUM	21900	3830 J	2600 J			2680 J	1470 J
MANGANESE	470 K	253	504			496	25.6
MERCURY	0.04 U	0.04 U	0.04 U			0.04 U	0.04 U
NICKEL	12.1	15.9	10.9			12.6	5.8
POTASSIUM	1820	1860	680			972	277 B
SELENIUM	1.3	0.93 B	0.96 B			0.69 B	0.51 B
SILVER	0.28 UL	0.17 U	0.16 U			0.38 B	0.17 U
SODIUM	1620	335 B	118 B			312 B	204 B
THALLIUM	1.5 B	0.73 U	0.70 U	0.71 U	0.69 U	0.72 U	0.70 U
VANADIUM	25.6	11.6	34.2			25.0	54.2
ZINC	32.4	44.0 J	27.6 J			34.6 J	15.9 J

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-10	W-TR04-11	W-TR04-12	W-TR04-13	W-TR04-14	W-TR04-15	W-TR04-19
SAMPLE DATE:	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:			Excavated				
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE			240	10 U			10 U
2-CHLOROETHYL VINYL ETHER	10 U	10 U			10 U	10 U	
2-HEXANONE			10 U	10 U			10 U
4-METHYL-2-PENTANONE			10 U	10 U			10 U
ACETONE			130	10 U			8 J
BENZENE			7	5 U			5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE			5 U	5 U			5 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE			3000	5 U			5 U
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
STYRENE			5 U	5 U			5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-10	W-TR04-11	W-TR04-12	W-TR04-13	W-TR04-14	W-TR04-15	W-TR04-19
SAMPLE DATE:	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:			Excavated				
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE			2900	2 B			5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	5 U			5 U	5 U	
VINYL ACETATE			10 U	10 U			10 U
VINYL CHLORIDE	10 U	10 U	2 J	10 U	10 U	10 U	10 U
XYLENES, TOTAL			25000	15 U			15 U
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE			330 U	330 U			330 U
1,2-DICHLOROBENZENE	5 U	5 U	330 U	330 U	5 U	5 U	330 U
1,3-DICHLOROBENZENE	5 U	5 U	330 U	330 U	5 U	5 U	330 U
1,4-DICHLOROBENZENE	5 U	5 U	330 U	330 U	2 B	5 U	330 U
2,4,5-TRICHLOROPHENOL			800 U	800 U			800 U
2,4,6-TRICHLOROPHENOL			330 U	330 U			330 U
2,4-DICHLOROPHENOL			330 U	330 U			330 U
2,4-DIMETHYLPHENOL			330 U	330 U			330 U
2,4-DINITROPHENOL			1600 UJ	1600 UJ			1600 UJ
2-CHLORONAPHTHALENE			330 U	330 U			330 U
2-CHLOROPHENOL			330 U	330 U			330 U
2-METHYLNAPHTHALENE	330 U	330 U	45 J	330 U	330 U	330 U	330 U
2-METHYLPHENOL			330 U	330 U			330 U
2-NITROANILINE			1600 U	1600 U			1600 U
2-NITROPHENOL			330 U	330 U			330 U
3,3'-DICHLOROBENZIDINE			660 U	660 U			660 U
3-NITROANILINE			1600 U	1600 U			1600 U
4,6-DINITRO-2-METHYLPHENOL			1600 U	1600 U			1600 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-10	W-TR04-11	W-TR04-12	W-TR04-13	W-TR04-14	W-TR04-15	W-TR04-19
SAMPLE DATE:	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:			Excavated				
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER			330 U	330 U			330 U
4-CHLORO-3-METHYLPHENOL			330 U	330 U			330 U
4-CHLOROANILINE			330 U	330 U			330 U
4-CHLOROPHENYL PHENYL ETHER			330 U	330 U			330 U
4-METHYLPHENOL			330 U	330 U			330 U
4-NITROANILINE			1600 U	1600 U			1600 U
4-NITROPHENOL			1600 U	1600 U			1600 U
ACENAPHTHENE	330 U	330 U	8 J	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	13 J	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	43 J	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	35 J	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	26 J	330 U	54 J	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	10 J	330 U	28 J	330 U	330 U
BENZOIC ACID			1600 U	1600 U			1600 U
BENZYL ALCOHOL			330 U	330 U			330 U
BIS(2-CHLOROETHOXY)METHANE			330 U	330 U			330 U
BIS(2-CHLOROETHYL)ETHER			330 U	330 U			330 U
BIS(2-CHLOROISOPROPYL) ETHER			330 U	330 U			330 U
BIS(2-ETHYLHEXYL)PHTHALATE			150 J	330 U			330 U
BUTYLBENZYL PHTHALATE			330 U	330 U			330 U
CHRYSENE	330 U	330 U	74 J	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE			330 U	330 U			330 U
DI-N-OCTYL PHTHALATE			330 U	330 U			330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZOFURAN			330 U	330 U			330 U
DIETHYL PHTHALATE			330 U	330 U			330 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-10	W-TR04-11	W-TR04-12	W-TR04-13	W-TR04-14	W-TR04-15	W-TR04-19
SAMPLE DATE:	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:			Excavated				
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE			330 U	330 U			330 U
FLUORANTHENE	330 U	330 U	43 J	330 U	56 J	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE			330 U	330 U			330 U
HEXACHLOROBUTADIENE			330 U	330 U			330 U
HEXACHLOROCYCLOPENTADIENE			330 U	330 U			330 U
HEXACHLOROETHANE			330 U	330 U			330 U
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ISOPHORONE			330 U	330 U			330 U
N-NITROSO-DI-N-PROPYLAMINE			330 U	330 U			330 U
N-NITROSODIPHENYLAMINE			330 U	330 U			330 U
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL			1600 U	1600 U			1600 U
PHENANTHRENE	330 U	330 U	65 J	330 U	330 U	330 U	330 U
PHENOL			330 U	330 U			330 U
PYRENE	330 U	330 U	75 J	330 U	140 J	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD			16.0 U	16.0 U			16.0 U
4,4'-DDE			16.0 U	16.0 U			16.0 U
4,4'-DDT			16.0 U	16.0 U			16.0 U
ALDRIN			8.0 U	8.0 U			8.0 U
ALPHA-BHC			8.0 U	8.0 U			8.0 U
AROCLOR-1016	40 U	40 U	40.0 U	40.0 U	40 U	40 U	40.0 U
AROCLOR-1221	80 U	80 U	80.0 U	80.0 U	80 U	80 U	80.0 U
AROCLOR-1232	40 U	40 U	40.0 U	40.0 U	40 U	40 U	40.0 U
AROCLOR-1242	12 J	40 U	140	40.0 U	100	40 U	40.0 U
AROCLOR-1248	40 U	40 U	40.0 U	40.0 U	40 U	40 U	40.0 U
AROCLOR-1254	40 U	40 U	40.0 U	40.0 U	40 U	40 U	40.0 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-10	W-TR04-11	W-TR04-12	W-TR04-13	W-TR04-14	W-TR04-15	W-TR04-19
SAMPLE DATE:	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:			Excavated				
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40 U	40.0 U	40.0 U	40 U	40 U	40.0 U
BETA-BHC			8.0 U	8.0 U			8.0 U
CHLORDANE			80.0 U	80.0 U			80.0 U
DELTA-BHC			8.0 U	8.0 U			8.0 U
DIELDRIN			16.0 U	16.0 U			16.0 U
ENDOSULFAN I			16.0 U	16.0 U			16.0 U
ENDOSULFAN II			16.0 U	16.0 U			16.0 U
ENDOSULFAN SULFATE			16.0 U	16.0 U			16.0 U
ENDRIN			16.0 U	16.0 U			16.0 U
ENDRIN ALDEHYDE			32.0 U	32.0 U			32.0 U
GAMMA-BHC (LINDANE)			8.0 U	8.0 U			8.0 U
HEPTACHLOR			8.0 U	8.0 U			8.0 U
HEPTACHLOR EPOXIDE			8.0 U	8.0 U			8.0 U
METHOXYCHLOR			80.0 U	80.0 U			80.0 U
TOXAPHENE			160 U	160 U			160 U
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE			330 U	330 U			330 U
2,6-DINITROTOLUENE			330 U	330 U			330 U
NITROBENZENE			330 U	330 U			330 U
METALS (mg/kg)							
ALUMINUM			11600	10900			7610
ANTIMONY			0.71 U	0.63 U			0.64 U
ARSENIC			5.0 K	5.9 K			2.2
BARIUM			96.3 J	103 J			48.4 J
BERYLLIUM			1.3	1.3			0.36 B
CADMIUM			0.05 UL	0.04 UL			0.04 U
CALCIUM			4630 J	1040 J			851 J
CHROMIUM			19.5 J	19.8 J			18.3 J

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR04-10	W-TR04-11	W-TR04-12	W-TR04-13	W-TR04-14	W-TR04-15	W-TR04-19
SAMPLE DATE:	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96	11/20/96
STATUS:			Excavated				
TRENCH:	4	4	4	4	4	4	4
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT			10.8	9.0			1.8
COPPER			120	23.4			5.1
IRON			18400	19800			8170
LEAD			14.3	6.6			5.9
MAGNESIUM			4550 J	2980 J			1280 J
MANGANESE			409	398			23.8
MERCURY			0.04 U	0.04 U			0.04 U
NICKEL			15.7	20.9			6.7
POTASSIUM			1780	855			427
SELENIUM			0.54 B	0.65 B			0.34 U
SILVER			0.47 B	0.16 U			0.17 U
SODIUM			1570	149 B			170 B
THALLIUM	0.72 U	0.71 U	0.77 U	0.69 U	0.63 U	0.72 U	0.70 U
VANADIUM			29.5	34.5			13.2
ZINC			51.4 J	31.4 J			19.0 J

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR05-01	W-TR05-02	W-TR05-03	W-TR05-04	W-TR05-05	W-TR05-06	W-TR05-07
SAMPLE DATE:	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96
STATUS:							
TRENCH:	5	5	5	5	5	5	5
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE						10 U	10 U
2-CHLOROETHYL VINYL ETHER	10 U	10 U	10 U	10 U	10 U		
2-HEXANONE						10 U	10 U
4-METHYL-2-PENTANONE						10 U	10 U
ACETONE						10 U	10 U
BENZENE						5 U	5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE						5 U	5 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE						5 U	5 U
METHYLENE CHLORIDE	3 B	2 B	2 B	3 B	3 B	3 B	3 B
STYRENE						5 U	5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR05-01	W-TR05-02	W-TR05-03	W-TR05-04	W-TR05-05	W-TR05-06	W-TR05-07
SAMPLE DATE:	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96
STATUS:							
TRENCH:	5	5	5	5	5	5	5
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE						5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U		
VINYL ACETATE						10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL						15 U	15 U
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE						330 U	330 U
1,2-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	330 U	330 U
1,3-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	330 U	330 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	330 U	330 U
2,4,5-TRICHLOROPHENOL						800 U	800 U
2,4,6-TRICHLOROPHENOL						330 U	330 U
2,4-DICHLOROPHENOL						330 U	330 U
2,4-DIMETHYLPHENOL						330 U	330 U
2,4-DINITROPHENOL						1600 U	1600 U
2-CHLORONAPHTHALENE						330 U	330 U
2-CHLOROPHENOL						330 U	330 U
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL						330 U	330 U
2-NITROANILINE						1600 U	1600 U
2-NITROPHENOL						330 U	330 U
3,3'-DICHLOROBENZIDINE						660 U	660 U
3-NITROANILINE						1600 U	1600 U
4,6-DINITRO-2-METHYLPHENOL						1600 U	1600 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR05-01	W-TR05-02	W-TR05-03	W-TR05-04	W-TR05-05	W-TR05-06	W-TR05-07
SAMPLE DATE:	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96
STATUS:							
TRENCH:	5	5	5	5	5	5	5
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER						330 U	330 U
4-CHLORO-3-METHYLPHENOL						330 U	330 U
4-CHLOROANILINE						330 U	330 U
4-CHLOROPHENYL PHENYL ETHER						330 U	330 U
4-METHYLPHENOL						330 U	330 U
4-NITROANILINE						1600 U	1600 U
4-NITROPHENOL						1600 U	1600 U
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZOIC ACID						1600 U	1600 U
BENZYL ALCOHOL						330 U	330 U
BIS(2-CHLOROETHOXY)METHANE						330 U	330 U
BIS(2-CHLOROETHYL)ETHER						330 U	330 U
BIS(2-CHLOROISOPROPYL) ETHER						330 U	330 U
BIS(2-ETHYLHEXYL)PHTHALATE						330 U	330 U
BUTYLBENZYL PHTHALATE						330 U	330 U
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE						330 U	330 U
DI-N-OCTYL PHTHALATE						330 U	330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZOFURAN						330 U	330 U
DIETHYL PHTHALATE						330 U	330 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR05-01	W-TR05-02	W-TR05-03	W-TR05-04	W-TR05-05	W-TR05-06	W-TR05-07
SAMPLE DATE:	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96
STATUS:							
TRENCH:	5	5	5	5	5	5	5
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE						330 U	330 U
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE						330 U	330 U
HEXACHLOROBUTADIENE						330 U	330 U
HEXACHLOROCYCLOPENTADIENE						330 U	330 U
HEXACHLOROETHANE						330 U	330 U
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ISOPHORONE						330 U	330 U
N-NITROSO-DI-N-PROPYLAMINE						330 U	330 U
N-NITROSODIPHENYLAMINE						330 U	330 U
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL						1600 U	1600 U
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENOL						330 U	330 U
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD						16.0 U	16.0 U
4,4'-DDE						16.0 U	16.0 U
4,4'-DDT						16.0 U	16.0 U
ALDRIN						8.0 U	8.0 U
ALPHA-BHC						8.0 U	8.0 U
AROCLOR-1016	40 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1221	80 U	80 U	80 U	80 U	80 U	80.0 U	80.0 U
AROCLOR-1232	40 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1242	40 U	47	40 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1248	40 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U
AROCLOR-1254	40 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR05-01	W-TR05-02	W-TR05-03	W-TR05-04	W-TR05-05	W-TR05-06	W-TR05-07
SAMPLE DATE:	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96
STATUS:							
TRENCH:	5	5	5	5	5	5	5
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40 U	40 U	40 U	40 U	40.0 U	40.0 U
BETA-BHC						8.0 U	8.0 U
CHLORDANE						80.0 U	80.0 U
DELTA-BHC						8.0 U	8.0 U
DIELDRIN						16.0 U	16.0 U
ENDOSULFAN I						16.0 U	16.0 U
ENDOSULFAN II						16.0 U	16.0 U
ENDOSULFAN SULFATE						16.0 U	16.0 U
ENDRIN						16.0 U	16.0 U
ENDRIN ALDEHYDE						32.0 U	32.0 U
GAMMA-BHC (LINDANE)						8.0 U	8.0 U
HEPTACHLOR						8.0 U	8.0 U
HEPTACHLOR EPOXIDE						8.0 U	8.0 U
METHOXYCHLOR						80.0 U	80.0 U
TOXAPHENE						160 U	160 U
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE						330 U	330 U
2,6-DINITROTOLUENE						330 U	330 U
NITROBENZENE						330 U	330 U
METALS (mg/kg)							
ALUMINUM						10200	9560
ANTIMONY						0.91 L	0.70 UL
ARSENIC						0.49	1.8
BARIUM						200	76.7
BERYLLIUM						1.7 J	0.86 J
CADMIUM						0.04 UL	0.04 UL
CALCIUM						3270	1130
CHROMIUM						20.6	35.2

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR05-01	W-TR05-02	W-TR05-03	W-TR05-04	W-TR05-05	W-TR05-06	W-TR05-07
SAMPLE DATE:	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96
STATUS:							
TRENCH:	5	5	5	5	5	5	5
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT						15.5	2.8
COPPER						3.9 J	6.8
IRON						24000	12600
LEAD						19.9	7.8
MAGNESIUM						4300	1560
MANGANESE						1030	126
MERCURY						0.04 U	0.04 U
NICKEL						24.3	8.5
POTASSIUM						2400	701 K
SELENIUM						2.0 J	0.72 J
SILVER						0.31 U	0.31 U
SODIUM						214 K	196 K
THALLIUM	1.5 L	0.79 L	1.3 L	2.1	1.6 L	0.26 UL	0.24 UL
VANADIUM						23.6	25.0
ZINC						48.7	23.1

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR05-08	W-TR05-14	W-TR05-08-AVG	W-TR05-09	W-TR05-10	W-TR05-11	W-TR05-12
SAMPLE DATE:	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96
STATUS:							
TRENCH:	5	5	5	5	5	5	5
FIELD DUPLICATE OF:		W-TR05-08					
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-CHLOROETHYL VINYL ETHER	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
METHYLENE CHLORIDE	3 B	3 B	3 B	3 B	4 B	3 B	4 B
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	0.2 J	5 U	0.2 J	5 U	5 U	5 U	5 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
SEMIVOLATILES (µg/kg)							
1,2-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR05-08	W-TR05-14	W-TR05-08-AVG	W-TR05-09	W-TR05-10	W-TR05-11	W-TR05-12
SAMPLE DATE:	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96
STATUS:							
TRENCH:	5	5	5	5	5	5	5
FIELD DUPLICATE OF:		W-TR05-08					
SEMIVOLATILES (µg/kg)							
1,3-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 UJ
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1016	40 U	40 U	40 U	40 U	40 U	40 U	40 UJ
AROCLOR-1221	80 U	80 U	80 U	80 U	80 U	80 U	80 U
AROCLOR-1232	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1242	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1248	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1254	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1260	40 U	40 U	40 U	40 U	40 U	40 U	40 U
METALS (mg/kg)							

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR05-08	W-TR05-14	W-TR05-08-AVG	W-TR05-09	W-TR05-10	W-TR05-11	W-TR05-12
SAMPLE DATE:	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96	08/22/96
STATUS:							
TRENCH:	5	5	5	5	5	5	5
FIELD DUPLICATE OF:		W-TR05-08					
METALS (mg/kg)							
THALLIUM	1.8 L	3.6	2.7	1.7 L	0.96 L	1.4 L	1.1 K

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-00	W-TR06-09	W-TR06-00-AVG	W-TR06-01	W-TR06-02	W-TR06-03	W-TR06-04
SAMPLE DATE:	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96
STATUS:							
TRENCH:	6	6	6	6	6	6	6
FIELD DUPLICATE OF:		W-TR06-00					
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-CHLOROETHYL VINYL ETHER	10 UR	10 UR	5 R	10 UR	10 UR	10 UR	10 UR
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
SEMIVOLATILES (µg/kg)							
1,2-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-00	W-TR06-09	W-TR06-00-AVG	W-TR06-01	W-TR06-02	W-TR06-03	W-TR06-04
SAMPLE DATE:	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96
STATUS:							
TRENCH:	6	6	6	6	6	6	6
FIELD DUPLICATE OF:		W-TR06-00					
SEMIVOLATILES (µg/kg)							
1,3-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1016	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1221	80 U	80 U	80 U	80 U	80 U	80 U	80 U
AROCLOR-1232	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1242	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1248	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1254	40 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1260	40 U	40 U	40 U	40 U	40 U	40 U	40 U
METALS (mg/kg)							

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-00	W-TR06-09	W-TR06-00-AVG	W-TR06-01	W-TR06-02	W-TR06-03	W-TR06-04
SAMPLE DATE:	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96
STATUS:							
TRENCH:	6	6	6	6	6	6	6
FIELD DUPLICATE OF:		W-TR06-00					
METALS (mg/kg)							
THALLIUM	1.1 L	0.50 L	0.8 L	2.0 L	0.74 L	1.3 L	0.57 L

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-05	W-TR06-06	W-TR06-07	W-TR06-08	W-TR06-10	W-TR06-11	W-TR06-12
SAMPLE DATE:	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96
STATUS:		Excavated					
TRENCH:	6	6	6	6	6	6	6
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE		10 UJ	10 UJ				
2-CHLOROETHYL VINYL ETHER	10 UR			10 UR	10 UR	10 UR	10 UR
2-HEXANONE		10 U	10 U				
4-METHYL-2-PENTANONE		10 U	10 U				
ACETONE		10 UJ	10 UJ				
BENZENE		5 U	5 U				
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE		5 U	5 U				
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE		5 U	5 U				
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
STYRENE		5 U	5 U				

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-05	W-TR06-06	W-TR06-07	W-TR06-08	W-TR06-10	W-TR06-11	W-TR06-12
SAMPLE DATE:	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96
STATUS:		Excavated					
TRENCH:	6	6	6	6	6	6	6
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE		5 U	5 U				
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U			5 U	5 U	5 U	5 U
VINYL ACETATE		10 U	10 U				
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL		15 U	15 U				
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE		330 U	330 U				
1,2-DICHLOROBENZENE	5 U	330 U	330 U	5 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	5 U	330 U	330 U	5 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	5 U	330 U	330 U	5 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL		800 U	800 U				
2,4,6-TRICHLOROPHENOL		330 U	330 U				
2,4-DICHLOROPHENOL		330 U	330 U				
2,4-DIMETHYLPHENOL		330 U	330 U				
2,4-DINITROPHENOL		1600 U	1600 U				
2-CHLORONAPHTHALENE		330 U	330 U				
2-CHLOROPHENOL		330 U	330 U				
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL		330 U	330 U				
2-NITROANILINE		1600 U	1600 U				
2-NITROPHENOL		330 U	330 U				
3,3'-DICHLOROBENZIDINE		660 U	660 U				
3-NITROANILINE		1600 U	1600 U				
4,6-DINITRO-2-METHYLPHENOL		1600 U	1600 U				

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-05	W-TR06-06	W-TR06-07	W-TR06-08	W-TR06-10	W-TR06-11	W-TR06-12
SAMPLE DATE:	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96
STATUS:		Excavated					
TRENCH:	6	6	6	6	6	6	6
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER		330 U	330 U				
4-CHLORO-3-METHYLPHENOL		330 U	330 U				
4-CHLOROANILINE		330 U	330 U				
4-CHLOROPHENYL PHENYL ETHER		330 U	330 U				
4-METHYLPHENOL		330 U	330 U				
4-NITROANILINE		1600 U	1600 U				
4-NITROPHENOL		1600 U	1600 U				
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZOIC ACID		1600 U	1600 U				
BENZYL ALCOHOL		330 U	330 U				
BIS(2-CHLOROETHOXY)METHANE		330 U	330 U				
BIS(2-CHLOROETHYL)ETHER		330 U	330 U				
BIS(2-CHLOROISOPROPYL) ETHER		330 U	330 U				
BIS(2-ETHYLHEXYL)PHTHALATE		330 U	330 U				
BUTYLBENZYL PHTHALATE		330 U	330 U				
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE		330 U	330 U				
DI-N-OCTYL PHTHALATE		330 U	330 U				
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DIBENZOFURAN		330 U	330 U				
DIETHYL PHTHALATE		330 U	330 U				

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-05	W-TR06-06	W-TR06-07	W-TR06-08	W-TR06-10	W-TR06-11	W-TR06-12
SAMPLE DATE:	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96
STATUS:		Excavated					
TRENCH:	6	6	6	6	6	6	6
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE		330 U	330 U				
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE		330 U	330 U				
HEXACHLOROBUTADIENE		330 U	330 U				
HEXACHLOROCYCLOPENTADIENE		330 U	330 U				
HEXACHLOROETHANE		330 U	330 U				
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ISOPHORONE		330 U	330 U				
N-NITROSO-DI-N-PROPYLAMINE		330 U	330 U				
N-NITROSODIPHENYLAMINE		330 U	330 U				
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL		1600 U	1600 U				
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENOL		330 U	330 U				
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD		16.0 U	16.0 U				
4,4'-DDE		16.0 U	16.0 U				
4,4'-DDT		16.0 U	16.0 U				
ALDRIN		8.0 U	8.0 U				
ALPHA-BHC		8.0 U	8.0 U				
AROCLOR-1016	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U
AROCLOR-1221	80 U	80.0 U	80.0 U	80 U	80 U	80 U	80 U
AROCLOR-1232	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U
AROCLOR-1242	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U
AROCLOR-1248	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U
AROCLOR-1254	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-05	W-TR06-06	W-TR06-07	W-TR06-08	W-TR06-10	W-TR06-11	W-TR06-12
SAMPLE DATE:	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96
STATUS:		Excavated					
TRENCH:	6	6	6	6	6	6	6
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40.0 U	40.0 U	40 U	40 U	40 U	40 U
BETA-BHC		8.0 U	8.0 U				
CHLORDANE		80.0 U	80.0 U				
DELTA-BHC		8.0 U	8.0 U				
DIELDRIN		16.0 U	16.0 U				
ENDOSULFAN I		16.0 U	16.0 U				
ENDOSULFAN II		16.0 U	16.0 U				
ENDOSULFAN SULFATE		16.0 U	16.0 U				
ENDRIN		16.0 U	16.0 U				
ENDRIN ALDEHYDE		32.0 U	32.0 U				
GAMMA-BHC (LINDANE)		8.0 U	8.0 U				
HEPTACHLOR		8.0 U	8.0 U				
HEPTACHLOR EPOXIDE		8.0 U	8.0 U				
METHOXYCHLOR		80.0 U	80.0 U				
TOXAPHENE		160 U	160 U				
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE		330 U	330 U				
2,6-DINITROTOLUENE		330 U	330 U				
NITROBENZENE		330 U	330 U				
METALS (mg/kg)							
ALUMINUM		8320 J	10500 J				
ANTIMONY		0.69 U	0.68 U				
ARSENIC		2.7	4.7				
BARIUM		139 J	92.7 J				
BERYLLIUM		1.3 J	1.6 J				
CADMIUM		0.04 U	0.04 U				
CALCIUM		3450 J	2570 J				
CHROMIUM		14.3 J	23.8 J				

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-05	W-TR06-06	W-TR06-07	W-TR06-08	W-TR06-10	W-TR06-11	W-TR06-12
SAMPLE DATE:	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96	10/17/96
STATUS:		Excavated					
TRENCH:	6	6	6	6	6	6	6
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT		10.2 J	8.8 J				
COPPER		1.7 J	4.0 J				
IRON		17500 J	35900 J				
LEAD		14.4	12.6				
MAGNESIUM		3310 J	2960 J				
MANGANESE		3760 J	183 J				
MERCURY		0.04 U	0.04 U				
NICKEL		36.6	11.6				
POTASSIUM		1840 J	1470 J				
SELENIUM		3.1	2.5				
SILVER		0.44 L	0.30 UL				
SODIUM		408 K	367 K				
THALLIUM	1.2 L	2.6	1.6 L	0.75 L	1.3 L	2.3 L	0.41 UL
VANADIUM		14.6 J	23.4 J				
ZINC		38.3	34.4				

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-13	W-TR06-14	W-TR07-01	W-TR07-02	W-TR07-03	W-TR07-04	W-TR07-05
SAMPLE DATE:	10/17/96	10/17/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:							
TRENCH:	6	6	7	7	7	7	7
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE	10 UJ						
2-CHLOROETHYL VINYL ETHER		10 UR	10 U	10 U	10 U	10 U	10 U
2-HEXANONE	10 U						
4-METHYL-2-PENTANONE	10 U						
ACETONE	10 UJ						
BENZENE	5 U						
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE	5 U						
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	1 J	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	5 U						
METHYLENE CHLORIDE	5 U	5 U	3 J	3 J	5 U	4 J	3 J
STYRENE	5 U						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-13	W-TR06-14	W-TR07-01	W-TR07-02	W-TR07-03	W-TR07-04	W-TR07-05
SAMPLE DATE:	10/17/96	10/17/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:							
TRENCH:	6	6	7	7	7	7	7
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	5 U						
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE		5 U	5 U	5 U	5 U	5 U	5 U
VINYL ACETATE	10 U						
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL	15 U						
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE	330 U						
1,2-DICHLOROBENZENE	330 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	330 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	330 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL	800 U						
2,4,6-TRICHLOROPHENOL	330 U						
2,4-DICHLOROPHENOL	330 U						
2,4-DIMETHYLPHENOL	330 U						
2,4-DINITROPHENOL	1600 U						
2-CHLORONAPHTHALENE	330 U						
2-CHLOROPHENOL	330 U						
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL	330 U						
2-NITROANILINE	1600 U						
2-NITROPHENOL	330 U						
3,3'-DICHLOROBENZIDINE	660 U						
3-NITROANILINE	1600 U						
4,6-DINITRO-2-METHYLPHENOL	1600 U						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-13	W-TR06-14	W-TR07-01	W-TR07-02	W-TR07-03	W-TR07-04	W-TR07-05
SAMPLE DATE:	10/17/96	10/17/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:							
TRENCH:	6	6	7	7	7	7	7
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER	330 U						
4-CHLORO-3-METHYLPHENOL	330 U						
4-CHLOROANILINE	330 U						
4-CHLOROPHENYL PHENYL ETHER	330 U						
4-METHYLPHENOL	330 U						
4-NITROANILINE	1600 U						
4-NITROPHENOL	1600 U						
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	210 J	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	170 J	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	190 J	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 U	330 U	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	100 J	330 U	330 U	330 U
BENZOIC ACID	1600 U						
BENZYL ALCOHOL	330 U						
BIS(2-CHLOROETHOXY)METHANE	330 U						
BIS(2-CHLOROETHYL)ETHER	330 U						
BIS(2-CHLOROISOPROPYL) ETHER	330 U						
BIS(2-ETHYLHEXYL)PHTHALATE	330 U						
BUTYLBENZYL PHTHALATE	330 U						
CHRYSENE	330 U	330 U	330 U	220 J	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE	330 U						
DI-N-OCTYL PHTHALATE	330 U						
DIBENZO(A,H)ANTHRACENE	330 U	330 U	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ
DIBENZOFURAN	330 U						
DIETHYL PHTHALATE	330 U						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-13	W-TR06-14	W-TR07-01	W-TR07-02	W-TR07-03	W-TR07-04	W-TR07-05
SAMPLE DATE:	10/17/96	10/17/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:							
TRENCH:	6	6	7	7	7	7	7
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE	330 U						
FLUORANTHENE	330 U	330 U	330 U	410	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE	330 U						
HEXACHLOROBUTADIENE	330 U						
HEXACHLOROCYCLOPENTADIENE	330 U						
HEXACHLOROETHANE	330 U						
INDENO(1,2,3-CD)PYRENE	330 U	330 U	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ
ISOPHORONE	330 U						
N-NITROSO-DI-N-PROPYLAMINE	330 U						
N-NITROSODIPHENYLAMINE	330 U						
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL	1600 U						
PHENANTHRENE	330 U	330 U	330 U	260 J	330 U	330 U	330 U
PHENOL	330 U						
PYRENE	330 U	330 U	330 U	540	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD	16.0 U						
4,4'-DDE	16.0 U						
4,4'-DDT	16.0 U						
ALDRIN	8.0 U						
ALPHA-BHC	8.0 U						
AROCLOR-1016	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1221	80.0 U	80 U	80 U	80 U	80 U	80 U	80 U
AROCLOR-1232	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1242	40.0 U	40 U	40 U	92	40 U	150	76
AROCLOR-1248	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
AROCLOR-1254	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-13	W-TR06-14	W-TR07-01	W-TR07-02	W-TR07-03	W-TR07-04	W-TR07-05
SAMPLE DATE:	10/17/96	10/17/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:							
TRENCH:	6	6	7	7	7	7	7
FIELD DUPLICATE OF:							
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40.0 U	40 U	40 U	40 U	40 U	40 U	40 U
BETA-BHC	8.0 U						
CHLORDANE	80.0 U						
DELTA-BHC	8.0 U						
DIELDRIN	16.0 U						
ENDOSULFAN I	16.0 U						
ENDOSULFAN II	16.0 U						
ENDOSULFAN SULFATE	16.0 U						
ENDRIN	16.0 U						
ENDRIN ALDEHYDE	32.0 U						
GAMMA-BHC (LINDANE)	8.0 U						
HEPTACHLOR	8.0 U						
HEPTACHLOR EPOXIDE	8.0 U						
METHOXYCHLOR	80.0 U						
TOXAPHENE	160 U						
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE	330 U						
2,6-DINITROTOLUENE	330 U						
NITROBENZENE	330 U						
METALS (mg/kg)							
ALUMINUM	14200 J						
ANTIMONY	0.70 U						
ARSENIC	6.0						
BARIUM	73.8 J						
BERYLLIUM	0.87 J						
CADMIUM	0.04 U						
CALCIUM	1330 J						
CHROMIUM	21.5 J						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR06-13	W-TR06-14	W-TR07-01	W-TR07-02	W-TR07-03	W-TR07-04	W-TR07-05
SAMPLE DATE:	10/17/96	10/17/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:							
TRENCH:	6	6	7	7	7	7	7
FIELD DUPLICATE OF:							
METALS (mg/kg)							
COBALT	9.1 J						
COPPER	12.4 J						
IRON	19100 J						
LEAD	7.6						
MAGNESIUM	3080 J						
MANGANESE	390 J						
MERCURY	0.04 U						
NICKEL	13.6						
POTASSIUM	1250 J						
SELENIUM	1.3						
SILVER	0.31 UL						
SODIUM	340 K						
THALLIUM	1.1 L	0.90 L	1.5 J	2.0 J	1.4 J	1.3 J	1.3 J
VANADIUM	37.6 J						
ZINC	42.1						

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR07-11	W-TR07-05-AVG	W-TR07-06	W-TR07-07	W-TR07-08	W-TR07-09	W-TR07-10
SAMPLE DATE:	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:			Excavated				
TRENCH:	7	7	7	7	7	7	7
FIELD DUPLICATE OF:	W-TR07-05						
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-BUTANONE			10 UJ	10 UJ			
2-CHLOROETHYL VINYL ETHER	10 U	10 U			10 U	10 U	10 U
2-HEXANONE			10 UJ	10 UJ			
4-METHYL-2-PENTANONE			10 U	10 U			
ACETONE			10 UJ	10 UJ			
BENZENE			5 U	5 U			
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE			5 U	5 U			
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE			5 U	5 U			
METHYLENE CHLORIDE	4 J	3.5 J	5 U	4 J	3 J	4 J	3 J
STYRENE			5 U	5 U			

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR07-11	W-TR07-05-AVG	W-TR07-06	W-TR07-07	W-TR07-08	W-TR07-09	W-TR07-10
SAMPLE DATE:	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:			Excavated				
TRENCH:	7	7	7	7	7	7	7
FIELD DUPLICATE OF:	W-TR07-05						
VOLATILES (µg/kg)							
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE			5 U	5 U			
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	5 U			5 U	5 U	5 U
VINYL ACETATE			10 U	10 U			
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
XYLENES, TOTAL			15 U	15 U			
SEMIVOLATILES (µg/kg)							
1,2,4-TRICHLOROBENZENE			330 U	330 U			
1,2-DICHLOROBENZENE	5 U	5 U	330 U	330 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	5 U	5 U	330 U	330 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	5 U	5 U	330 U	330 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL			800 U	800 U			
2,4,6-TRICHLOROPHENOL			330 U	330 U			
2,4-DICHLOROPHENOL			330 U	330 U			
2,4-DIMETHYLPHENOL			330 U	330 U			
2,4-DINITROPHENOL			1600 U	1600 U			
2-CHLORONAPHTHALENE			330 U	330 U			
2-CHLOROPHENOL			330 U	330 U			
2-METHYLNAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
2-METHYLPHENOL			330 U	330 U			
2-NITROANILINE			1600 U	1600 U			
2-NITROPHENOL			330 U	330 U			
3,3'-DICHLOROBENZIDINE			660 U	660 U			
3-NITROANILINE			1600 U	1600 U			
4,6-DINITRO-2-METHYLPHENOL			1600 U	1600 U			

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR07-11	W-TR07-05-AVG	W-TR07-06	W-TR07-07	W-TR07-08	W-TR07-09	W-TR07-10
SAMPLE DATE:	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:			Excavated				
TRENCH:	7	7	7	7	7	7	7
FIELD DUPLICATE OF:	W-TR07-05						
SEMIVOLATILES (µg/kg)							
4-BROMOPHENYL PHENYL ETHER			330 U	330 U			
4-CHLORO-3-METHYLPHENOL			330 U	330 U			
4-CHLOROANILINE			330 U	330 U			
4-CHLOROPHENYL PHENYL ETHER			330 U	330 U			
4-METHYLPHENOL			330 U	330 U			
4-NITROANILINE			1600 U	1600 U			
4-NITROPHENOL			1600 U	1600 U			
ACENAPHTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ACENAPHTHYLENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)ANTHRACENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(A)PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(B)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZO(G,H,I)PERYLENE	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ
BENZO(K)FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
BENZOIC ACID			1600 U	1600 U			
BENZYL ALCOHOL			330 U	330 U			
BIS(2-CHLOROETHOXY)METHANE			330 U	330 U			
BIS(2-CHLOROETHYL)ETHER			330 U	330 U			
BIS(2-CHLOROISOPROPYL) ETHER			330 U	330 U			
BIS(2-ETHYLHEXYL)PHTHALATE			430 B	330 U			
BUTYLBENZYL PHTHALATE			330 U	330 U			
CHRYSENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
DI-N-BUTYL PHTHALATE			330 U	330 U			
DI-N-OCTYL PHTHALATE			330 U	330 U			
DIBENZO(A,H)ANTHRACENE	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ
DIBENZOFURAN			330 U	330 U			
DIETHYL PHTHALATE			330 U	330 U			

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR07-11	W-TR07-05-AVG	W-TR07-06	W-TR07-07	W-TR07-08	W-TR07-09	W-TR07-10
SAMPLE DATE:	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:			Excavated				
TRENCH:	7	7	7	7	7	7	7
FIELD DUPLICATE OF:	W-TR07-05						
SEMIVOLATILES (µg/kg)							
DIMETHYL PHTHALATE			330 U	330 U			
FLUORANTHENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
FLUORENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
HEXACHLOROBENZENE			330 U	330 U			
HEXACHLOROBUTADIENE			330 U	330 U			
HEXACHLOROCYCLOPENTADIENE			330 U	330 U			
HEXACHLOROETHANE			330 U	330 U			
INDENO(1,2,3-CD)PYRENE	330 UJ	330 U	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ
ISOPHORONE			330 U	330 U			
N-NITROSO-DI-N-PROPYLAMINE			330 U	330 U			
N-NITROSODIPHENYLAMINE			330 U	330 U			
NAPHTHALENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PENTACHLOROPHENOL			1600 U	1600 U			
PHENANTHRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PHENOL			330 U	330 U			
PYRENE	330 U	330 U	330 U	330 U	330 U	330 U	330 U
PESTICIDES/PCBs (µg/kg)							
4,4'-DDD			16.0 U	16.0 U			
4,4'-DDE			16.0 U	16.0 U			
4,4'-DDT			16.0 U	16.0 U			
ALDRIN			8.0 U	8.0 U			
ALPHA-BHC			8.0 U	8.0 U			
AROCLOR-1016	40 U	40 U	40.0 U	40.0 U	40 U	40 U	40 U
AROCLOR-1221	80 U	80 U	80.0 U	80.0 U	80 U	80 U	80 U
AROCLOR-1232	40 U	40 U	40.0 U	40.0 U	40 U	40 U	40 U
AROCLOR-1242	40 U	48	40.0 U	40.0 U	40 U	40 U	14 J
AROCLOR-1248	40 U	40 U	40.0 U	40.0 U	40 U	40 U	40 U
AROCLOR-1254	40 U	40 U	40.0 U	40.0 U	40 U	40 U	40 U

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR07-11	W-TR07-05-AVG	W-TR07-06	W-TR07-07	W-TR07-08	W-TR07-09	W-TR07-10
SAMPLE DATE:	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:			Excavated				
TRENCH:	7	7	7	7	7	7	7
FIELD DUPLICATE OF:	W-TR07-05						
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1260	40 U	40 U	40.0 U	40.0 U	40 U	40 U	40 U
BETA-BHC			8.0 U	8.0 U			
CHLORDANE			80.0 U	80.0 U			
DELTA-BHC			8.0 U	8.0 U			
DIELDRIN			16.0 U	16.0 U			
ENDOSULFAN I			16.0 U	16.0 U			
ENDOSULFAN II			16.0 U	16.0 U			
ENDOSULFAN SULFATE			16.0 U	16.0 U			
ENDRIN			16.0 U	16.0 U			
ENDRIN ALDEHYDE			32.0 U	32.0 U			
GAMMA-BHC (LINDANE)			8.0 U	8.0 U			
HEPTACHLOR			8.0 U	8.0 U			
HEPTACHLOR EPOXIDE			8.0 U	8.0 U			
METHOXYCHLOR			80.0 U	80.0 U			
TOXAPHENE			160 U	160 U			
ENERGETICS (µg/kg)							
2,4-DINITROTOLUENE			330 U	330 U			
2,6-DINITROTOLUENE			330 U	330 U			
NITROBENZENE			330 U	330 U			
METALS (mg/kg)							
ALUMINUM			6680	11900			
ANTIMONY			0.90 L	0.58 L			
ARSENIC			0.52 L	2.6 L			
BARIUM			310 J	105 J			
BERYLLIUM			1.7	1.5			
CADMIUM			0.05 U	0.05 U			
CALCIUM			4590 L	1580 L			
CHROMIUM			15.1	26.2			

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR07-11	W-TR07-05-AVG	W-TR07-06	W-TR07-07	W-TR07-08	W-TR07-09	W-TR07-10
SAMPLE DATE:	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96	08/07/96
STATUS:			Excavated				
TRENCH:	7	7	7	7	7	7	7
FIELD DUPLICATE OF:	W-TR07-05						
METALS (mg/kg)							
COBALT			15.1	15.6			
COPPER			1.7 L	8.6 L			
IRON			17300	27700			
LEAD			19.8 L	13.9 L			
MAGNESIUM			2990 L	2930 L			
MANGANESE			2840	999			
MERCURY			0.04 U	0.04 U			
NICKEL			57.5	15.0			
POTASSIUM			1940	1800			
SELENIUM			2.3	1.8			
SILVER			0.34	0.19 U			
SODIUM			258 B	211 B			
THALLIUM	1.4 J	1.35 J	2.5 J	2.2 J	1.9 J	1.2 J	1.1 J
VANADIUM			12.9	33.2			
ZINC			39.8 J	35.3 J			

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR07-12	W-TR07-13	/ /	/ /	/ /	/ /	/ /
SAMPLE DATE:	08/26/96	08/26/96					
STATUS:	Excavated						
TRENCH:	7	7					
FIELD DUPLICATE OF:							
VOLATILES (µg/kg)							
1,1,1-TRICHLOROETHANE		5 U					
1,1,2,2-TETRACHLOROETHANE		5 U					
1,1,2-TRICHLOROETHANE		5 U					
1,1-DICHLOROETHANE		5 U					
1,1-DICHLOROETHENE		5 U					
1,2-DICHLOROETHANE		5 U					
1,2-DICHLOROPROPANE		5 U					
2-CHLOROETHYL VINYL ETHER		10 U					
BROMODICHLOROMETHANE		5 U					
BROMOFORM		5 U					
BROMOMETHANE		10 U					
CARBON TETRACHLORIDE		5 U					
CHLOROBENZENE		5 U					
CHLOROETHANE		10 U					
CHLOROFORM		5 U					
CHLOROMETHANE		10 U					
CIS-1,2-DICHLOROETHENE		5 U					
CIS-1,3-DICHLOROPROPENE		5 U					
DIBROMOCHLOROMETHANE		5 U					
METHYLENE CHLORIDE		4 B					
TETRACHLOROETHENE		5 U					
TRANS-1,2-DICHLOROETHENE		5 U					
TRANS-1,3-DICHLOROPROPENE		5 U					
TRICHLOROETHENE		5 U					
TRICHLOROFLUOROMETHANE		5 U					
VINYL CHLORIDE		10 U					
SEMIVOLATILES (µg/kg)							
1,2-DICHLOROBENZENE		5 U					

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR07-12	W-TR07-13	/ /	/ /	/ /	/ /	/ /
SAMPLE DATE:	08/26/96	08/26/96					
STATUS:	Excavated						
TRENCH:	7	7					
FIELD DUPLICATE OF:							
SEMIVOLATILES (µg/kg)							
1,3-DICHLOROBENZENE		5 U					
1,4-DICHLOROBENZENE		5 U					
2-METHYLNAPHTHALENE		330 U					
ACENAPHTHENE		330 U					
ACENAPHTHYLENE		330 U					
ANTHRACENE		330 U					
BENZO(A)ANTHRACENE		330 U					
BENZO(A)PYRENE		330 U					
BENZO(B)FLUORANTHENE		330 U					
BENZO(G,H,I)PERYLENE		330 U					
BENZO(K)FLUORANTHENE		330 U					
CHRYSENE		330 U					
DIBENZO(A,H)ANTHRACENE		330 U					
FLUORANTHENE		330 U					
FLUORENE		330 U					
INDENO(1,2,3-CD)PYRENE		330 U					
NAPHTHALENE		330 U					
PHENANTHRENE		330 U					
PYRENE		330 U					
PESTICIDES/PCBs (µg/kg)							
AROCLOR-1016		40 U					
AROCLOR-1221		80 U					
AROCLOR-1232		40 U					
AROCLOR-1242		40 U					
AROCLOR-1248		40 U					
AROCLOR-1254		40 U					
AROCLOR-1260		40 U					
METALS (mg/kg)							

CTO 159 - NAWC WARMINSTER
SITE 4 - REMOVAL ACTION
VERIFICATION SAMPLING ANALYTICAL RESULTS

SAMPLE NUMBER:	W-TR07-12	W-TR07-13					
SAMPLE DATE:	08/26/96	08/26/96	/ /	/ /	/ /	/ /	/ /
STATUS:	Excavated						
TRENCH:	7	7					
FIELD DUPLICATE OF:							
METALS (mg/kg)							
MANGANESE	3750 L						
THALLIUM		1.4 B					

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

CODES RELATING TO IDENTIFICATION
(CONFIDENCE CONCERNING PRESENCE OR ABSENCE OF COMPOUNDS):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

CODES RELATED TO QUANTITATION
(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

NJ = Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.