Bernhardt, Aaron

From: Bernhardt, Aaron
Sent: Friday, July 11, 2008 9:47 AM
To: 'Pinkoski, Ronald CIV NAVFAC'; 'Jurka, Val CIV NAVFAC Atlantic, Ev33'; 'Conant, Richard CIV NAVFAC MIDLANT'; 'Keckler.Kymberlee@epamail.epa.gov'; 'mark.lewis@po.state.ct.us'; 'Kenneth_Munney@fws.gov'; 'rtfinlayson@GFNET.com'; 'Hoskins.Bart@epamail.epa.gov'
Cc: Rich, Corey
Subject: RE: Area A Wetland Toxicity Testing Memorandum
Attachments: Toxicity Test Memo.pdf

Sorry,

Here is the attachment.

Aaron

From: Bernhardt, Aaron
Sent: Friday, July 11, 2008 9:46 AM
To: 'Pinkoski, Ronald CIV NAVFAC'; 'Jurka, Val CIV NAVFAC Atlantic, Ev33'; 'Conant, Richard CIV NAVFAC MIDLANT'; 'Keckler.Kymberlee@epamail.epa.gov'; 'mark.lewis@po.state.ct.us'; 'Kenneth_Munney@fws.gov'; 'rtfinlayson@GFNET.com'; 'Hoskins.Bart@epamail.epa.gov'
Cc: Rich, Corey
Subject: Area A Wetland Toxicity Testing Memorandum

All,

Attached is the toxicity test memorandum which summarizes the agreements made during the June 27, 2008 site visit/technical meeting regarding the toxicity testing that will be conducted at the Area A Wetland at New London. We plan on submitting a formal QAPP addendum to the Phase III QAPP in August, but I just wanted to make sure we were on the same page regarding sample locations, analyses, tests, etc. before submitting the QAPP.

Please provide any comments by July 23 , if possible.

Thanks,

Aaron

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TECHNICAL MEMORANDUM
SELECTION OF LOCATIONS FOR SEDIMENT TOXICITY TESTS
AREA A WETLAND – SITE 2B
NAVAL SUBMARINE BASE – NEW LONDON, GROTON, CONNECTICUT

This technical memorandum presents the locations recommended for the collection of sediment samples for quick-turn chemical analysis (5 to 7-day turn-around time) and toxicity testing (on a sub-set of samples). This memorandum also presents the general approach that will be used to select the locations for toxicity testing and a brief summary of the toxicity tests that will be conducted and.

Table 1 lists the locations where samples will be collected for quick-turn chemical analysis. As shown in Table 1, samples are proposed to be collected at 19 potential "site" locations and 5 potential "reference" locations (3 previously samples and two locations not previously sampled). More than one sample will be collected at some locations while one sample will be collected between 2WSD9 and 2WSD57 as discussed in the comments column in Table 1. These locations are shown on Figure 1, which also highlights the locations where chemical concentrations were greater than the probable effects concentration. Figures 2, 3, and 4 present the chemical concentrations for select metals (copper, lead, nickel, and zinc), PAHs, and DDx, respectively, in the previous samples from each of the proposed sample locations.

Where possible, the selected locations (except for the reference samples) are the locations where the greatest chemical concentrations were found. Three potential reference samples will be collected from the western side of the wetland where cadmium levels were elevated to: 1) verify whether the cadmium levels are still elevated, and 2) use at least one of the locations as a reference location if the cadmium levels are not elevated. Sediment samples also will be collected from two locations that have not been sampled previously, but are not expected to have elevated chemical concentrations. Of the five potential reference locations, the two locations with the overall lowest chemical concentrations will be selected as the reference locations.

Table 1 also presents the rationale for selecting the locations and quick-turn analysis that will be conducted on each sample. Based on the results of the quick-turn analysis, it is anticipated that 12 to 13 site samples and 2 reference samples will be selected for toxicity testing. Those selected samples will also be analyzed for the parameters (i.e., pesticides, TAL metals, PAHs, PCBs, and total organic carbon) that were not analyzed for on a quick-turn basis. For example, if 2WSD52 is selected for toxicity testing, it will be analyzed for metals, PAHs, and PCBs. It will not be re-analyzed for DDx because it would have already been analyzed for DDx on a quick-turn basis. The reference locations will not need additional analysis (except TOC) because they will have quick-turn analysis conducted for all the other parameters.

Two toxicity tests will be conducted with growth and survival as the endpoints, as follows:

- 10-day *Chironomus dilutus* test
- 28-day *Hyalella azteca* test

All sediment samples will be collected from the top four inches of sediment, after first removing the larger pieces of organic material/debris from the ground surface. Approximately one gallon of sediment will be collected from each location. The sediment will be homogenized and placed into two sets of containers. One set of containers will be sent to a laboratory for quick-turn analysis (and held for the non-quick turn parameters) of the parameters listed in Table 1. The second set of containers will be sent to a different laboratory for toxicity testing and held for analysis.

Within a day or two after the quick-turn analysis results are received, the Navy will submit a table to the regulators with the analytical results, a list of samples selected for toxicity testing, and the reasons why those samples were selected. A consensus will have to be reached within one or two days to meet the typical 14-day hold time for the toxicity testing. At that time, the Navy will notify the laboratories to complete the chemical analysis and conduct the toxicity testing on the selected samples.

TABLE 1

SUMMARY OF LOCATIONS SELECTED FOR POTENTIAL TOXICITY TESTING
SITE 2B - AREA A WETLAND
NSB-NLON, GROTON, CONNECTICUT

Sample Location[1]	Sample Date	Sample Depth (feet)		SAMPLE CONCENTRATIONS											Rationale	Comments	Quick-Turn Analysis			
		Top	Bottom	ARSENIC (MG/KG) PEC = 33	CADMIUM (MG/KG) PEC = 4.98	COPPER (MG/KG) PEC = 149	LEAD (MG/KG) PEC = 128	MERCURY (MG/KG) PEC = 1.06	NICKEL (MG/KG) PEC = 48.6	ZINC (MG/KG) PEC = 459	TOTAL PAHS (UG/KG) PEC = 22800	TOTAL AROCLOR (UG/KG) PEC = 676	TOTAL CHLORDANE (UG/KG) PEC = 17.6	TOTAL DDT (DDx) (UG/KG) PEC = 572			DDx	Metals	PCB	PAH
2WCSD4	19931220	0	1	6.9	1.1 J	39.4	49.9	0.38	18.5	61.9	24326	0 U	0 U	66.5	High PAH results. May select sample for toxicity testing if [PAH] is greater than its PEC.					X
2WSD55	20071018	0	0.5	52.5 J	0.1 UR	41.2 J	33.4 J	0.23 J	15.2 J	80.1 J	2246	0 UR	0 U	3.9	High As result. Will collect two samples near this location. If [As] in either sample is greater than its PEC, the sample with the greater [As] will be selected for toxicity testing. If neither sample has an [As] greater than its PEC, neither sample will be selected for the toxicity testing.			As		
2WSD9	19901126	0	0.5	11.8 J	6.1	39.6 J	231 J	0.24 J	21.2	109	411400	0 U	0 U	0 U	High Pb and PAH results. May select sample for toxicity testing if [Cd], [Pb], or [PAH] are greater than the PECs.	One sediment sample will be collected between these two locations. Both sample locations are in the drainage ditch leading from the Area A Weapons Center. 2WSD9 is next to the culvert and 2WSD57 is a few feet downstream.		Cd, Pb		X
2WSD57	20071018	0	0.33	4.3 J	1.1 J	19.2	159	0.02	11.2 J	339	48109									
T6A	19941129	0	1	7.65	0.675	123.5	125	0.43 J	27.6 J	204 J	3558	1450	51	12.5	High PCB result. May select sample for toxicity testing if [PCB] is greater than its PEC.	PCBs not a significant issue at the site. Want to confirm PCB detection in historic sample.			X	
2WCSD5	19931220	0	1	5.6	29.5	57.2	204	0.18	31.5	292	2982	0 U	13.4	10	High Cd and Pb results but low concentration of other parameters. May select sample for toxicity testing if [Cd] or [Pb] are greater than their PECs.	Collecy by outfall pipe from Weapons Center. May use Zn results in selection process for concentration gradients.		Cd, Pb, Zn		
2WSD50	20071018	0	0.33	43.6 J	0.14 UR	64 J	54 J	0.29 J	28.8 J	447 J	2430	370	23	118	High As result. Will collect two samples near this location. If [As] in either sample is greater than its PEC, the sample with the greater [As] will be selected for toxicity testing. If neither sample has an [As] greater than its PEC, neither sample will be selected for the toxicity testing.			As		
2WSD44	20071019	0	0.33	12.8 J	1.1 J	82.3 J	45.2 J	0.26 J	19.6 J	630 J	7633	150	0 U	122	High Zn results. Will collect two samples in the general area of 2WSD44 and T7B. May select sample for toxicity testing if the [Cu] or [Zn] are greater than their PECs.	Although [Cu] was less than athe PEC at this location, the Cu may be used in the selection process for the concentration gradients.		Cu, Zn		
2WSD48	20071019	0	0.33	11.5	1.2	59.9	49.7	0.21	30.2	624	11479	580	0 U	515	High Zn result. May select for the toxicity test if the [Zn] is greater than its PEC.	May use Cu and Pb results in selection process for concentration gradients.		Cu, Pb, Zn		
2WSD49	20071018	0	0.33	14.6 J	1.2 J	92.3 J	39.2	0.13	28.3 J	646	1640	0 U	30	87	High Zn result. May select for the toxicity test if the [Zn] is greater than its PEC.	May use Cu and Pb results in selection process for concentration gradients.		Cu, Pb, Zn		
T7B	19941129	0	1	8.1 J	1.6 J	173 J	110 J	0.76 UR	47.7 J	762 J	4280	550	22	140	High Cu and/or Zn results. Will collect two samples in the general area of 2WSD44 and T7B. May select sample for toxicity testing if the [Cu] or [Zn] are greater than their PECs.	May use Pb result in selection process for concentration gradient.		Cu, Pb, Zn		
2WSD52	20071018	0	0.5	13.5	1.1 J	96.7	119	0.31	23.5	60.6	2230	0 U	0 U	794	High DDx results. May select sample for toxicity testing if [DDx] greater than its PEC.		X			
2WSD47	20071019	0	0.5	8.3 J	2.15 J	110 J	86.95 J	0.405 J	34.6 J	333 J	7286	405	0 U	612	High DDx results. Will select sample for toxicity testing, if [DDx] greater than PEC and result is needed for concentration gradient.		X	Cu, Pb, Zn		
2WSD43	20071019	0	0.33	16.6 J	1.8 J	161 J	127 J	0.72 J	30.9 J	653 J	3115	300	111	1358	High Cu, Pb, Zn, Chlordane, and DDx. May select sample for toxicity testing [Cu], [Zn], or [DDx] are greater than their PECs.	Will not analyze chlordane on a quick-turn basis because it is not a significant risk driver. The sample will be analyzed for chlordane if selected for toxicity testing.	X	Cu, Pb, Zn		
T3A	19941128	0	1	3	0.26	34.5	32.1	0.15 J	8.6 J	87.4 J	26959	0 U	4.4	1548	High PAH and DDx results. Will collect two samples in the general area of T3A and T3B to try to duplicate these results. May select for toxicity testing if [PAH] or [DDx] are greater than their PECs.	Will not analyze chlordane on a quick-turn bases because it is not a significant risk driver. The sample will be analyzed for chlordane if selected for toxicity testing.	X			X

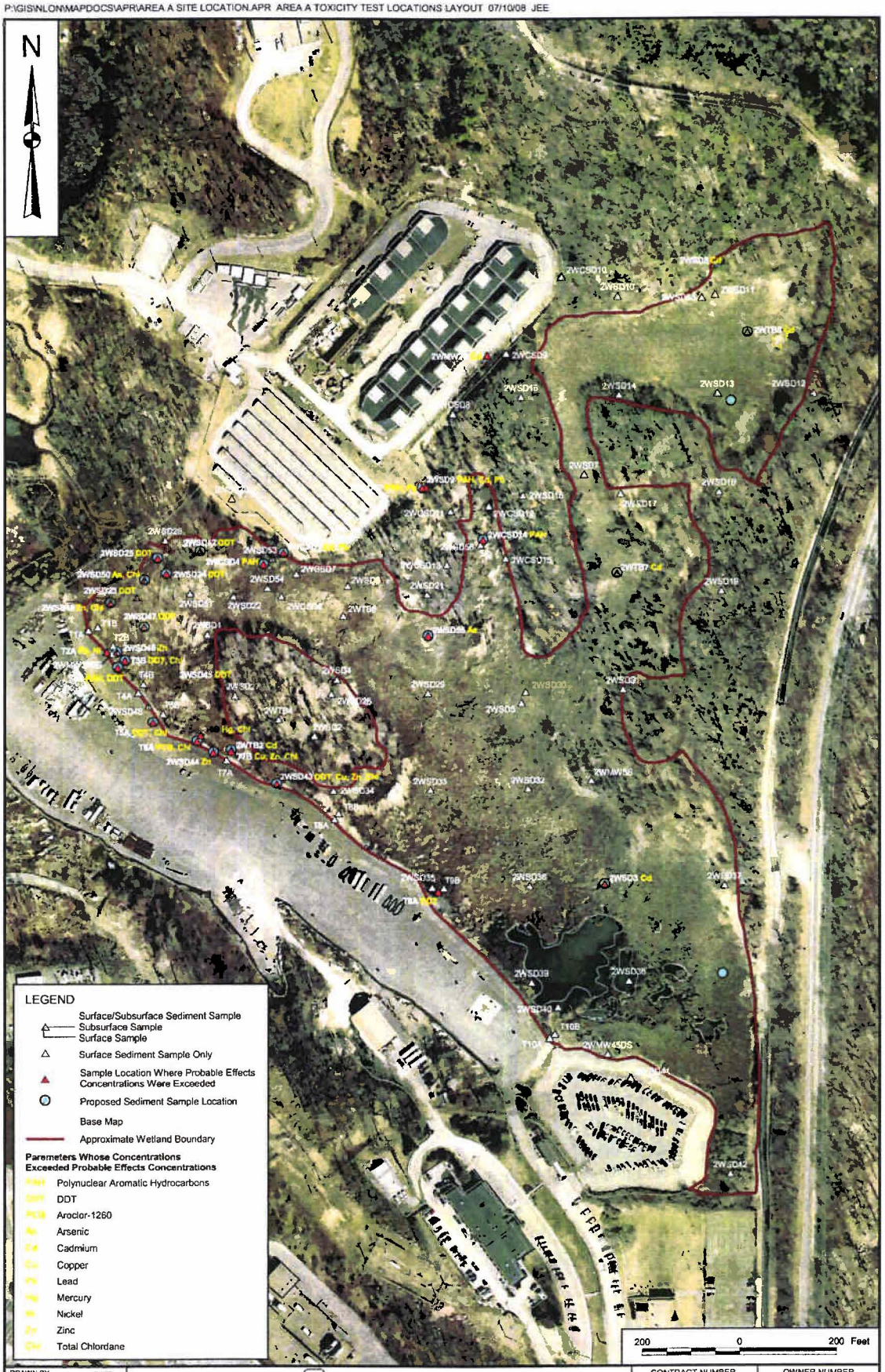
TABLE 1

SUMMARY OF LOCATIONS SELECTED FOR POTENTIAL TOXICITY TESTING
SITE 2B - AREA A WETLAND
NSB-NLON, GROTON, CONNECTICUT
PAGE 2 OF 2

Sample Location[1]	Sample Date	Sample Depth (feet)		SAMPLE CONCENTRATIONS											Rationale	Comments	Quick-Turn Analysis			
		Top	Bottom	ARSENIC (MG/KG)	CADMIUM (MG/KG)	COPPER (MG/KG)	LEAD (MG/KG)	MERCURY (MG/KG)	NICKEL (MG/KG)	ZINC (MG/KG)	TOTAL PAHS (UG/KG)	TOTAL AROCLOR (UG/KG)	TOTAL CHLORDANE (UG/KG)	TOTAL DDT (DDx) (UG/KG)			DDx	Metals	PCB	PAH
				PEC = 33	PEC = 4.98	PEC = 149	PEC = 128	PEC = 1.06	PEC = 48.6	PEC = 459	PEC = 22800	PEC = 676	PEC = 17.6	PEC = 572						
T5A	19941129	0	1	2.1	0.15 U	28.4	40.6	0.15 UR	13.8 J	68.2 J	3172	0 U	21.7	1737	High DDx results. May select sample for toxicity testing, if [DDx] greater than its PEC.		X			
2WSD24	19931029	0	1									0 U	14	3330	High DDx results. Will collect two samples in the general of 2WSD24 and 25. May select one or both for toxicity testing (if [DDx] are greater than its PEC.		X			
T3B	19941128	0	1	2.6	0.43	52.6	61.5	0.19 J	18.9 J	284 J	5588	0 U	25	4630	High DDx results. Will collect two samples in the general area of T3A and T3B to try to duplicate these results. May select for toxicity testing if [DDx] is greater than the PEC.		X			
2WSD25	19931029	0	1									0 U	0 U	8420	High DDx results. Will collect two samples in the general of 2WSD24 and 25. May select one or both for toxicity testing (if [DDx] are greater than the PEC.		X			
2WCSD14	19931221	0	1	10.25	0.76 U	33.2	105.8	0.19 U	22.25	153.5	31265				High PAH results. May select sample for toxicity testing if [PAH] is greater than PEC.	Collect sample where ditch enters wetland.				X
POTENTIAL REFERENCE LOCATIONS																				
2WSD3	19901126	0	0.5	9.5 J	5.3	69.5 J	46.1	0.31 J	27	127	1060	0 U	0 U	57	Determine whether Cd levels are greater than the PEC and whether locations are suitable reference locations. If so, the location with the greatest concentration will be selected for toxicity testing. If not, the locations with the lowest chemical concentrations will be selected as the reference concentration.	Possible reference station locations if Cd results are low, as well as the results for the other parameters	X	Full	X	X
2WTB7	19900905	0	2	7.05 J	5.6	37.25	31.1 J	0.295	21.5	69.65 J	111.5	0 U		0 U			X	Full	X	X
2WTB8	19900830	1	3	6.8 J	5.7 J	55	83.7	0.67 J	26.9	62.9 J	4279	0 U	0 U	0 U			X	Full	X	X
Two additional locations															Possible reference locations	Possible reference station locations if concentrations are lower than they are at 2WSD3, 2WTB7, or 2WTB8.	X	Full	X	X

Shaded cells designate chemical concentrations that exceed their respective Probable Effects Concentration (PEC)

P:\GIS\NLON\MAPDOCS\APR\AREA A SITE LOCATION.APR AREA A TOXICITY TEST LOCATIONS LAYOUT 07/10/08 JEE



DRAWN BY J. ENGLISH DATE 07/10/08	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0439	OWNER NUMBER —
CHECKED BY A. BERNHARDT DATE 07/10/08	SAMPLE LOCATIONS FOR TOXICITY TEST INVESTIGATION AREA A WETLAND NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT	APPROVED BY —	DATE —
COST/SCHEDULE AREA		APPROVED BY —	DATE —
SCALE AS NOTED		DRAWING NO FIGURE 1	REV 0

Figure 2
Metals Concentrations at Each Sample Location

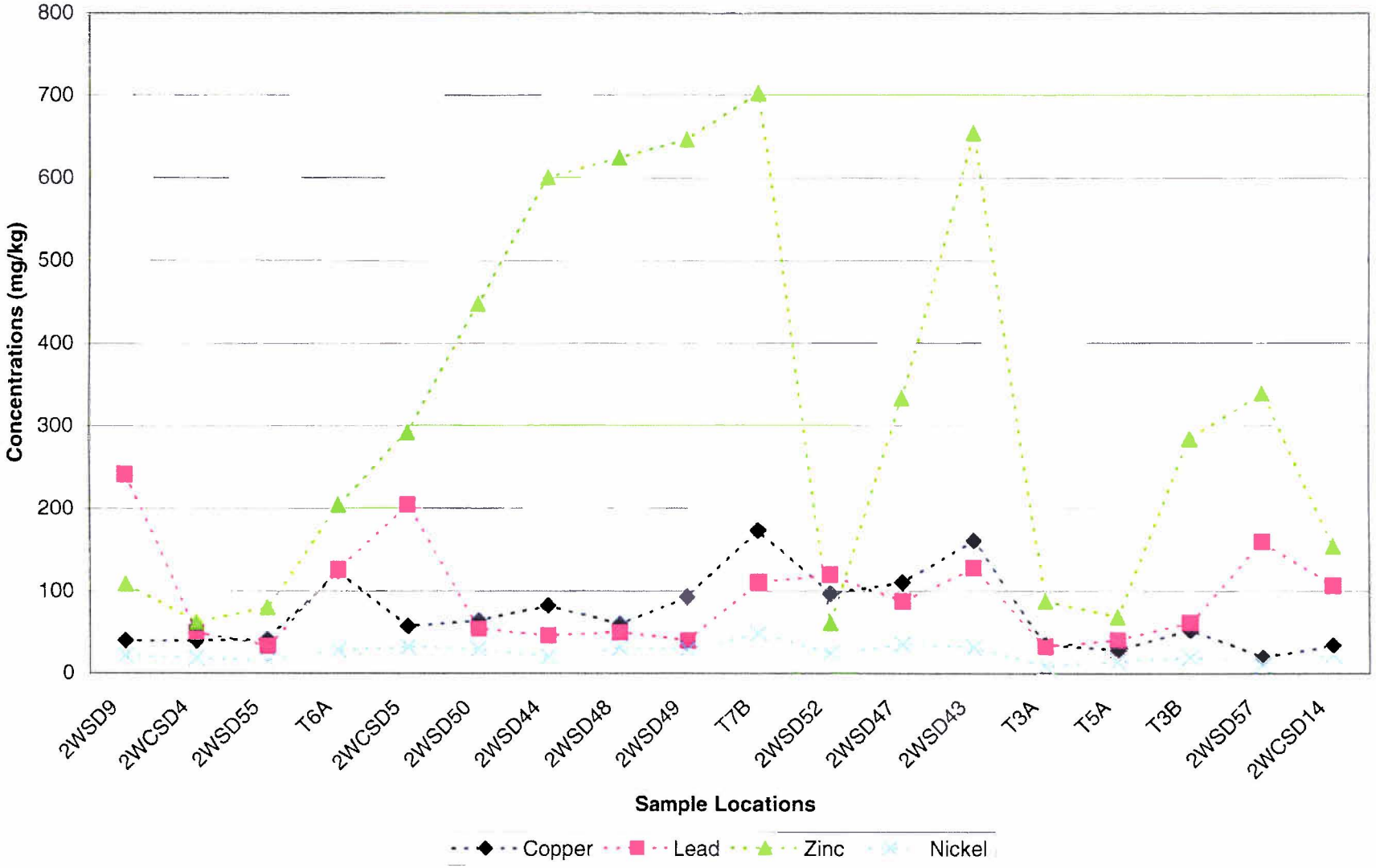
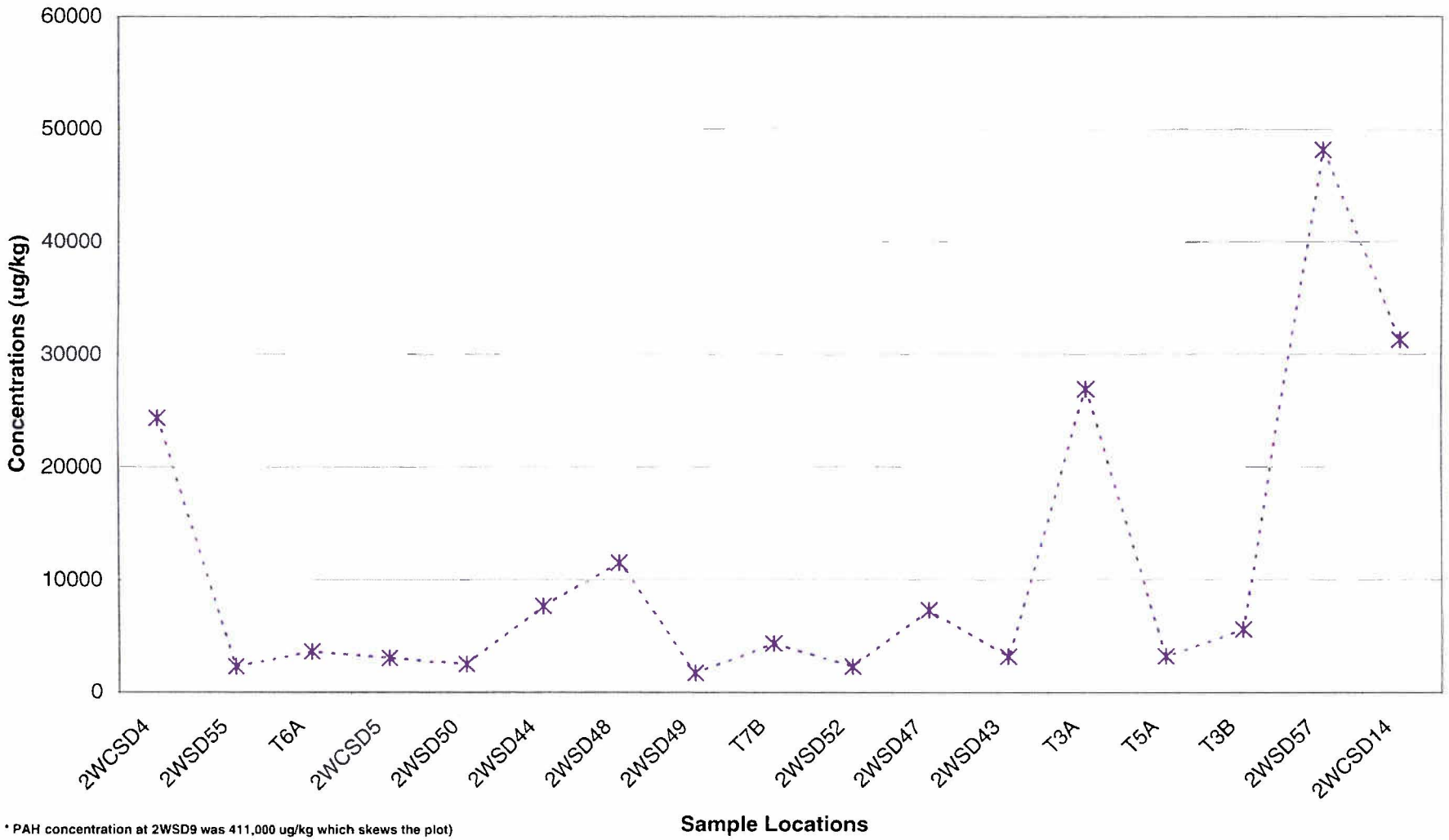


Figure 3
PAH Concentrations at Each Sample Location (excluding 2WSD9 Result*)



* PAH concentration at 2WSD9 was 411,000 ug/kg which skews the plot)

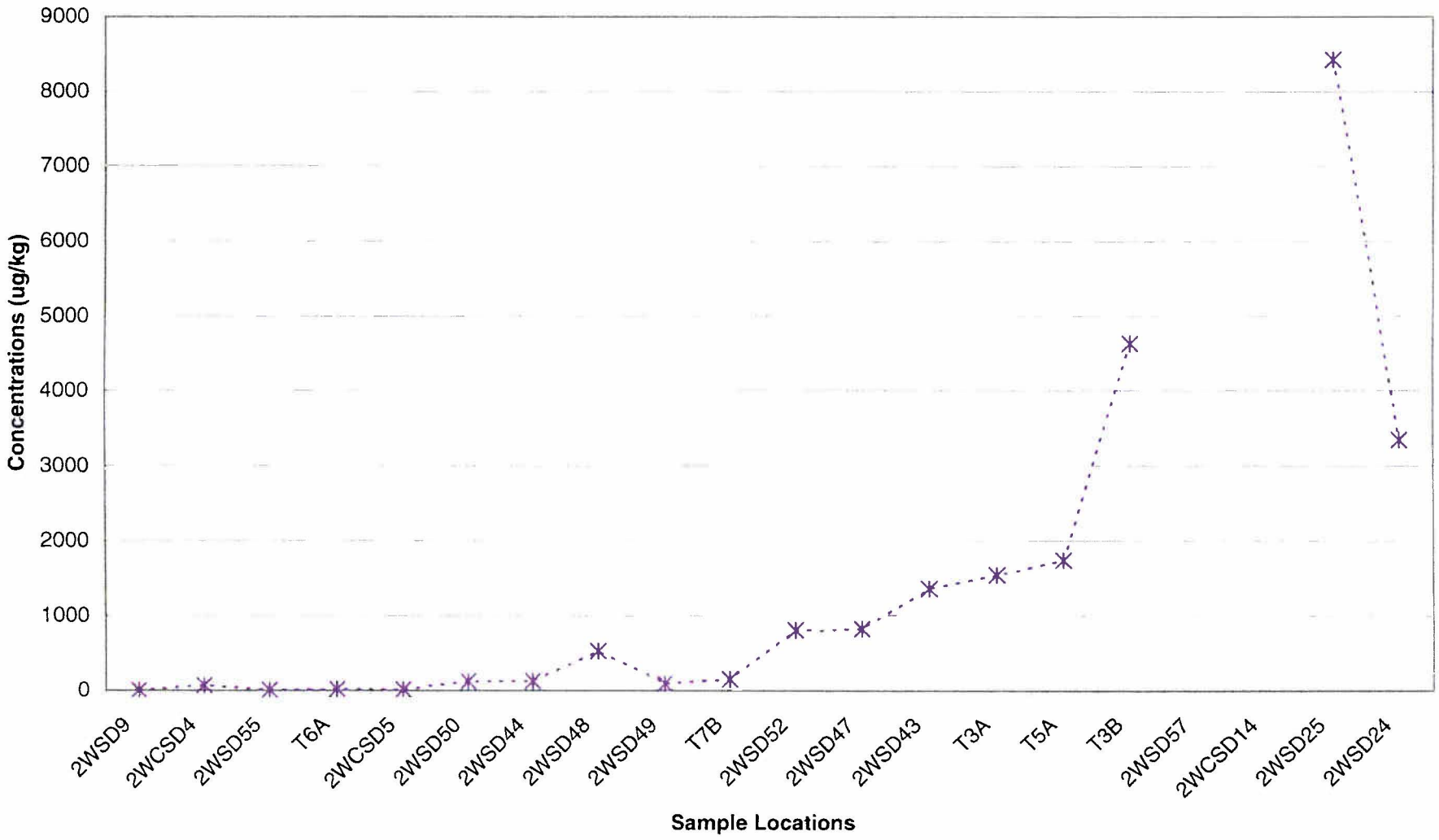



Figure 4
DDT Concentrations at Each Sample Location