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NAS PENSACOLA  
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LETTER FROM U S EPA REGION IV REGARDING SUGGESTED STEPS FORWARD TO  
COMPLETION OF ENVIRONMENTAL RISK ASSESSMENT SITE 41 NAS PENSACOLA FL  
4/30/2001  
U S EPA REGION IV

**TO:** PNS NAS Team

**FROM:** Lynn Wellman EPA  
Ken Seeley USFWS  
Tom Dillon NOAA

**SUBJECT:** Suggested Steps Forward to Complete the Site 41 ERA

**DATE:** April 30, 2001

## **1. Background**

On April 18, 2001, a site visit was conducted to the Site 41 wetlands at Pensacola Naval Air Station. Participating were Ron Joyner (PNS NAS), Barbara Albrecht and Phil Hardy (EnSafe), Lynn Wellman (EPA), Ken Seeley (USFWS/ERT) and Tom Dillon (NOAA/CPRD). The site visit was conducted to ground-truth speculations and answer questions that have arisen following publication of the RI report. Items of particular interest included the qualitative status of wetland habitats, any discreet chemical inputs to wetlands (e.g., pipes, culverts), the physical nature of certain surface water/sediment collection locations. The following are general observations and suggested steps forward to complete the Ecological Risk Assessment (ERA) portion of the Site 41 RI.

## **2. Observations**

- a. The habitat value of Site 41 wetlands should not be discounted in the RI report. Observations during the field visit indicate these wetlands support substantial numbers of diverse macro flora and fauna typical of freshwater and estuarine wetlands of northwest Florida.
- b. During the field visit, drawing showing storm water/sewer pipe locations and drainage areas were very useful in excluding/including potential contaminant inputs to Site 41 wetlands. These should be included and discussed in the RI report.
- c. High surface water concentrations reported in the RI may be driven by high suspended solids generated by the collection method. Suggest confirmation sampling of surface water using more quiescent collection methods.

## **3. Suggested Steps Forward to Complete the ERA**

- a. EPA provides an example COPC refinement table to the Navy (attached).

- b. The Navy refines COPCs for Wetland 64 using the table provided by EPA and distributes results for review.
- c. Ecological risk assessors meet to discuss and agree to final COPCs for Wetland 64.
- d. The Navy refines COPCs for all other wetlands using the approach agreed to for Wetland 64.
- e. Ecological risk assessors reconvene to scope additional work if indicated by the refinement (e.g., collection of prey items to model mercury exposure to higher trophic level consumers).

Analyte	Frequency of Detection	Range of Detection		Location of Maximum Concentration	Average Concentration	EPA Region IV ESV	Maximum Hazard Quotient	Average Hazard Quotient	# Samples Exceeding ESV	Range of Detection Limits
		Min.	Max.							
<b>Volatile Organics (µg/kg)</b>										
Acetone	3/3	16	63	PAI-01-SD-09-01	37	NA	NA	NA	NA	0
Carbon Disulfide	6/9	2	24	PAI-01-SD-001	77	NA	NA	NA	NA	8.0 - 1200
Toluene	6/9	3	7	PAI-01-SD-09-01	73	NA	NA	NA	NA	19 - 1200
<b>Semivolatile Organics (µg/kg)</b>										
Acenaphthylene	1/14	380	380	PAI-01-SD-02-01	351	5.87	64.7	59.8	1	71 - 3600
Anthracene	6/14	11	770	PAI-01-SD-001	143	46.9	16.4	3.0	4	2.8 - 850
Benzo(a)anthracene	8/14	30	2200	PAI-01-SD-017	352	74.8	29.4	4.7	5	7.1 - 850
Benzo(a)pyrene	9/14	7.8	1700	PAI-01-SD-017	319	88.8	19.1	3.6	6	7.1 - 850
Benzo(b)fluoranthene	10/14	8.1	1800	PAI-01-SD-017	318	88.8 2	20.3	3.6	6	2.8 - 850
Benzo(g,h,i)perylene	7/14	30	990	PAI-01-SD-017	199	88.8 2	11.1	2.2	6	11 - 850
Benzo(k)fluoranthene	9/14	3.1	850	PAI-01-SD-017	150	88.8 2	9.6	1.7	3	2.8 - 850
Carbazole	3/9	86	580	PAI-01-SD-02-01	377	88.8 2	6.5	4.2	2	470 - 1200
Chrysene	9/14	13	2300	PAI-01-SD-017	390	108	21.3	3.6	5	7.1 - 850
Dibenzo(a,h)anthracene	1/14	1600	1600	PAI-01-SD-017	216	6.22	257.2	34.7	1	11 - 850
Fluoranthene	9/14	25	6600	PAI-01-SD-017	903	113	58.4	8.0	6	7.1 - 850
Fluorene	1/14	160	160	PAI-01-SD-03-01-AVG	111	21.2	7.5	5.2	1	14 - 850
Indeno(1,2,3-cd)pyrene	8/14	30	1100	PAI-01-SD-017	220	88.8 2	12.4	2.5	6	7.1 - 850
Phenanthrene	8/14	25	2600	PAI-01-SD-001	409	86.7	30.0	4.7	5	5.7 - 850
Pyrene	7/14	64	5400	PAI-01-SD-017	769	153	35.3	5.0	5	14 - 850
Total PAHs	10/14	21.1	26580	PAI-01-SD-017	3957	1684	15.8	2.3	5	See note 1
<b>Pesticides/PCBs (µg/kg)</b>										
4,4'-DDD	4/14	3.6	260	PAI-01-SD-09-01	25.8	1.22	213.1	21.1	4	5.7 - 32
4,4'-DDE	6/14	5.5	120	PAI-01-SD-09-01	17.6	2.07	58.0	8.5	6	5.7 - 32
4,4'-DDT	4/13	3.2	270	PAI-01-SD-09-01	26.3	1.19	226.9	22.1	4	4.6 - 32
Alpha-Chlordane	1/8	52	52	PAI-01-SD-09-01	8.3	0.5 3	104.0	16.6	1	2.3 - 7.4
Gamma-Chlordane	1/14	130	130	PAI-01-SD-09-01	12.0	0.5 3	260.0	24.0	1	2.3 - 15.5
alpha-BHC	1/14	2.7	2.7	PAI-01-SD-02-01	3.0	NA	NA	NA	NA	2.3 - 15.5
beta-BHC	1/14	5.4	5.4	PAI-01-SD-02-01	3.2	NA	NA	NA	NA	2.3 - 15.5
delta-BHC	1/14	2.7	2.7	PAI-01-SD-02-01	3.0	NA	NA	NA	NA	2.3 - 15.5

gamma-BHC (Lindane)	1/14	2.1	2.1	2.1	PAI-01-SD-02-01	2.9	0.32	6.6	9.1	1	2.3 - 15.5
<b>Inorganics (mg/kg)</b>											
Aluminum	14/14	2110	23400	10179	PAI-01-SD-02-02	10179	NA	NA	NA	NA	0
Arsenic	13/14	1.2	15.6	6.2	PAI-01-SD-10-01	6.2	7.24	2.2	0.9	4	0.27
Barium	14/14	5.7	88.5	23.9	PAI-01-SD-09-01	23.9	NA	NA	NA	NA	0
Beryllium	3/14	0.7075	1.2	0.39	PAI-01-SD-10-01	0.39	NA	NA	NA	NA	0.17 - 0.95
Cadmium	1/14	0.79	0.79	0.08	PAI-01-SD-02-02	0.08	0.676	1.2	0.1	1	0.04 - 0.09
Cobalt	13/14	0.19	3.9	1.95	PAI-01-SD-10-01	1.95	NA	NA	NA	NA	5.7
Copper	13/14	5.5	95.3	27.4	PAI-01-SD-001	27.4	18.7	5.1	1.5	5	3.3
Iron	14/14	1930	24000	13221	PAI-01-SD-02-02	13221	NA	NA	NA	NA	0
Lead	14/14	6.6	194	48.5	PAI-01-SD-09-01	48.5	30.2	6.4	1.6	4	0
Manganese	14/14	12.3	190	92.5	PAI-01-SD-013-AVG	92.5	NA	NA	NA	NA	0
Mercury	2/14	0.16	0.67	0.126	PAI-01-SD-09-01	0.126	0.13	5.2	0.97	2	0.07 - 0.28
Silver	2/14	0.36	2.4	0.29	PAI-01-SD-09-01	0.29	0.733	3.3	0.4	1	0.06 - 1.1
Thallium	1/14	0.925	0.925	0.348	PAI-01-SD-013-AVG	0.348	NA	NA	NA	NA	0.38 - 1.1
Vanadium	14/14	4.3	50.65	27.3	PAI-01-SD-013-AVG	27.3	NA	NA	NA	NA	0
Zinc	14/14	10.5	124	45.0	PAI-01-SD-09-01	45.0	124	1.0	0.4	0	0

COPC = Contaminant of potential concern.

ESV = Ecological screening value

Hazard quotient = chemical concentration ÷ ESV

NA = EPA Region IV ESV not available

Total organic carbon (TOC) in sediment samples ranged from 0.8 to 4.3 percent. Grain size ranged from 0.1 to 0.5 per cent gravel, 58.2 to 67.3 per cent sand, 17.1 to 23.4 per cent silt, and 15.2 to 18.8 per cent clay. See Table 4-6 for TOC and grain size data in individual sediment samples.

1 For chemicals with at least one detection, the background value shown is twice the average concentration calculated using 1/2 the detection limit in non-detected samples was not detected in any background sample, the range of detection limits is shown.

2 Benzo(a)pyrene used as a surrogate.

3 Chlordane used as a surrogate.

Note 1: Total PAH concentrations were calculated as the sum of individual detected PAHs. Therefore, the range of non-detects is not applicable for total PAHs

Note 2: Indeno(1,2,3-cd)pyrene was the only PAH detected in background sediments; its background concentration is provided above.

a This chemical does not biomagnify in the food chain.

b No screening values were identified for this chemical.

c Potential risk to benthic receptors via direct toxicity.

d Potential risk to aquatic and semi-aquatic receptors via the food chain.

- e Maximum detected concentration is less than background concentration<sup>1</sup>.
- f Measured concentrations were less than alternate screening values.
- g Infrequent detection.
- h Maximum detected concentration is similar to background concentration.

Background Concentration <sup>1</sup>	Retained as COPC in Sediment?	Analyte
<b>Volatile Organics (µg/kg)</b>		
<7 to <110	Noab	Acetone
9.2	Noab	Carbon Disulfide
9.7	Noab	Toluene
<b>Semivolatile Organics (µg/kg)</b>		
<51 to <1200	Yesc	Acenaphthylene
<2 to <1200	Yesc	Anthracene
<5.1 to <1200	Yesc	Benzo(a)anthracene
<5.1 to <1200	Yesc	Benzo(a)pyrene
<2 to <1200	Yesc	Benzo(b)fluoranthene
<8.1 to <1200	Yesc	Benzo(g,h,i)perylene
<2 to <1200	Yesc	Benzo(k)fluoranthene
<400 to <1200	Yesc	Carbazole
<5.1 to <1200	Yesc	Chrysene
<20 to <1200	Yesc	Dibenzo(a,h)anthracene
<5.1 to <1200	Yesc	Fluoranthene
<10 to <1200	Yesc	Fluorene
518	Yesc	Indeno(1,2,3-cd)pyrene
<4 to <1200	Yesc	Phenanthrene
<10 to <1200	Yesc	Pyrene
See note 2	Yesc	Total PAHs
<b>Pesticides/PCBs (µg/kg)</b>		
<2 to <22	Yescd	4,4'-DDD
<2 to <22	Yescd	4,4'-DDE
<2 to <22	Yescd	4,4'-DDT
<0.99 to <11	Yescd	Alpha-Chlordane
<0.99 to <11	Yescd	Gamma-Chlordane
<0.99 to <11	Yescd	alpha-BHC
7.1	Yescd	beta-BHC
<0.99 to <11	Yescd	delta-BHC

<0.99 to <11	Yescd	gamma-BHC (Lindane)
<b>Inorganics (mg/kg)</b>		
24200	Noe	Aluminum
12	Yescd	Arsenic
28	Yesc	Barium
0.98	Nobh	Beryllium
0.28	Yescd	Cadmium
2.6	Noabf	Cobalt
10	Yescd	Copper
21500	Yesc	Iron
21	Yescd	Lead
186	Noabfh	Manganese
0.09	Yescd	Mercury
<0.06 to <1.9	Yesc	Silver
0.41	Noabg	Thallium
50	Noabfh	Vanadium
45	Yescd	Zinc

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. If the chemical