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David B. Struhs
Secretary

April 9, 2001

Mr. Bill Hill
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Southern Division
Naval Facilities Engineering Command
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RE: Final Remedial Investigation Report, Site 41, NAS
Pensacola Wetlands, NAS Pensacola

Dear Mr. Hill:

I have completed the technical review of the above referenced document dated August 31, 2000 (received September 1, 2000). The document has been extensively reorganized since the submittal of the draft report. As a result, it is not considered a final document. I have the following comments that must be addressed in the final report.

General Comments, Volume I and II

1. Section 4.5, Deviations from the Site 41 SAP Addendum: It is indicated in this section that due to a sampling error, mercury was not included in the analysis of the fish tissue samples. Since the submission of the draft report, a mercury model has been utilized to estimate mercury in upper trophic fish based on observed sediment concentrations. Since mercury was detected in sediment samples collected in a number of the wetlands, fish tissue samples should be collected and analyzed for mercury in order to reduce the uncertainty in the human health risk assessment.
2. Table 6-2, Site 41 Sediment Inorganic Reference Concentrations: Analytical results on this table should be reported in mg/kg (see Volume III, Appendix A) and not ug/L since these are sediment samples.

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Mr. Bill Hill
Page Two
April 9, 2001

3. Table 6-3, Site 41 Fresh Surface Water Inorganic Concentrations: The Freshwater Surface Water Criteria for Aluminum is 13 ug/L based on toxicity (Table 1, Chapter 62-777, Florida Administrative Code [FAC]).
4. Table 6-4, Site 41 Salt Surface Water Inorganic Concentrations: The Marine Surface Water Criteria for Aluminum is 13 ug/L based on toxicity (Table 1, Chapter 62-777, Florida Administrative Code [FAC]). The FDEP Criteria of 1500 ug/L, published in Chapter 62-302.530, Parameter (2) Aluminum, is modified later in Chapter 62-302.530, Parameter (62) Substances in concentrations which injure, are chronically toxic to, or produce adverse physiological or behavioral response in humans, plants, or animals.
5. Figure 7-1, Wetland Functional Use Assessment: Why is a variable condition indicated for mammals at Wetland 18 but not for the other wetlands on this table?
6. Page 7-27, Great Blue Heron Food Chain Model: This section presents calculations of site foraging factors (SFF) for the Great Blue Heron. In addition to the Great Blue Heron, a number of piscivorous birds have been observed in the NAS Pensacola Wetlands (e.g. Little Blue Heron, Belted Kingfisher, and Tricolored Heron). Has any comparison been made to these species and their respective foraging ranges?
7. Page 7-32: This page is presented twice in the report.
8. Figure 8-1, Conceptual Surface Water Migration Pathways: The figure presents the conceptual model for surface water migration pathways between many of the wetlands and is of great value to the reviewer. Why isn't a similar figure available in the report presenting a conceptual groundwater migration pathway.
9. Section 8.3.4.1, Screening Comparisons, Sediment and Surface Water Data, Page 8-14: It is stated that concentrations of lead reported in surface water were compared to 15 ug/L, the treatment technique action level. For wetlands located adjacent to marine surface waters, a comparison should be made the marine surface water criteria of 5.6 ug/L (Chapter 62-302.530, FAC).

Mr. Bill Hill
Page Three
April 9, 2001

10. Pages 8-16 and 8-17: Tables 8.3-4 and 8.3-5 should be corrected to 8-4 and 8-5 as indicated in the List of Tables and in the text.
11. Section 10.1.5.5 states that no surface water data were available and no COPCs were identified. What data is presented in Table 10-1-12 then?
12. Section 10.1.5.7, Remedial Goal Options: This section is printed twice in the report.
13. Page 10-3-2: The text discusses DDT and alpha-chlordane results for a sediment sample collected at location 0103. A comparison with Figure 10-3-1 and Table 10-3-2 indicate that this is possibly location 0303. This location should be verified and corrected if necessary.
14. Page 10-9-21, Section 10.9.6, Conclusions and Recommendations: This section is missing from the report.

Site Specific Summary and Comments, Volume II

Section 10.1, Wetland 64

Toxicity data indicate some mortality for amphipods but a higher survivability for polychaetes (a pollution tolerant species). Analysis of the sediment quality triad suggest that contaminants are stressing the benthic community.

Surface water samples exhibit elevated HQs for some metals and it is stated that there is a potential risk in Level 3 fish species from directly toxic effects (Page 10-1-56).

The recommendation on page 10-1-57 is to transfer the site to the petroleum program; however, elsewhere in the report there is a recommendation to transfer the site to the base stormwater program. The source of contamination to this wetland is apparently from some of the sites associated with Operable Unit (OU) 2 and also from storm water runoff. An evaluation of the Conceptual Surface Water Migration Pathways presented in Figure 8-1 suggests that this wetland is closely associated with Wetlands 5a, 5b, and 6.

Transfer of this wetland to the base storm water program will be considered; however, the source of water into these wetlands needs to be identified. The source of

Mr. Bill Hill
Page Four
April 9, 2001

petroleum contamination has not been established therefore it is unclear if transfer of any portion *of* this site to the petroleum program is appropriate at this time.

Section 10.2. Wetland 5A/5B

Wetland 5A and potentially 5B are impacted by Site 30 due to the presence of several volatile organic compounds (1,1-Dichloroethane, cis-1,2-dichloroethene, and vinyl chloride) detected in surface water samples. These compounds, while not exceeding surface water criteria, potentially represent degradation products of chlorinated solvents located in the Site 30 area.

Other volatile compounds (bromodichloromethane, chloroform, and dibromochloromethane) are potentially an artifact from the potable water supply release into Wetland 5A.

Transfer of this wetland to the base storm water program will be considered; however, the source of water into these wetlands needs to be identified.

Section 10.3. Wetland 3

HQs were high at sample location 0303 for DDT (184), DDE (57), and DDD (327). Results of the benthic toxicity study indicate that sediment contaminants are not bioavailable; however, toxicity samples were not collected at location 0303.

Four VOCs (benzene, chlorobenzene, methylene chloride, and cis-1,2-dichloroethene) were also detected in surface water samples and are potentially leaching from Site 1.

Wetland 3 is directly impacted by discharge of groundwater from Site 1 (OU1) and should continue to be monitored in conjunction with remedial activities at Site 1

Section 10.4, Wetland 4D

Table 10-4-12 indicates a slight risk for the trespasser and maintenance worker from arsenic in the sediments. Arsenic does not appear to be related to any CERCLA site and is most likely attributed to normal herbicide application on the golf course where Wetland 4B is located.

Mr. Bill Hill
Page Five
April 9, 2001

Since there is no apparent ecological risk at this wetland a no further action (NFA) decision is appropriate.

Section 10.5. Wetland 16

The two VOCs (1,1-dichloroethane and chlorobenzene) detected in surface water at Wetland 16 may be associated with leachate from Site 1 (OU1). The recommendation for NFA may be appropriate for Wetland 16; however, some monitoring of the wetland may be required in conjunction with remedial activities at Site 1.

Section 10.6, Wetland 18

Wetland 18A is fed by a groundwater seep originating from Site 1 (page 10-6-1).

Elevated HQs for chemicals in sediments include DDT (1512), DDD (762), DDE (130), arsenic (11.5), and naphthalene (8.6).

DDT and PCBs were detected in level 3 fish tissue. HQs estimated for heron exposure to total DDT in fish tissue exceeded 1 (3.67) based on feeding territory during the fall season.

Further delineation of DDT is recommended for this wetland. In addition, monitoring of surface water may be required in conjunction with remedial activities at Site 1

Section 10.7, Wetland 10

Silver is reported at one surface water sample location at a concentration of 24,500 ug/L. This is potentially a data entry error (a duplicate of the value reported for sodium) that should be corrected if necessary. The HQ for silver is not reported on Table 10-7-4. The freshwater surface water criteria of silver is 0.07 ug/L (Chapter 62-302, FAC).

A review of the surface flow conceptual model indicate that this wetland is potentially affected by Wetlands 12 and 13. Wetland 11 (East of Building 3644) may also potentially impact Wetland 10 if an overflow culvert from Wetland 11 extends east under a road into Wetland 10. It is likely that Wetland 10 is impacted by Sites 32, 33, and 35.

Mr. Bill Hill
Page Six
April 9, 2001

Transfer of this wetland to the base storm water program will be considered; however, the source of water into these wetlands needs to be identified.

Section 10.8, Wetland 12

The Pensacola Partnering Team referred Wetland 12 to the State of Florida Petroleum Program (documented in the September 19 and 20, 1996 Partnering Meeting Minutes). I agree with this decision.

Section 10.9, Wetland 1

A potential source to Wetland 1 is Site 1 (OU1) Sanitary Landfill. Based on the discussion conducted during the March 28, 2001 Partnering Meeting, activities associated with Forrest Sherman Field may also have been a source for PAHs.

The source of PAHs should be confirmed. This wetland may potentially require monitoring as part of remedial activities at Site 1.

Section 10.10, Wetland 15

Metals (aluminum, arsenic, beryllium, chromium, copper, iron, lead, mercury, nickel and zinc) exceed marine surface water criteria at sample location 1501. Sample turbidity exceeded 1,000 nephelometric turbidity units (NTUs) as reported in Table 4-1.

The source of mercury in the surface water should be identified. I recommend that a confirmation surface water sample be collected to determine if NFA is appropriate for this wetland.

Section 10.11, Wetland 6

A review of the surface flow conceptual model indicate that this wetland is affected by Wetland 5. Groundwater discharge into Wetland 6 from sites associated with OU2 and Site 23 (Chevalier Field Pipe Leak Area) is also likely to occur.

The conclusions state that Wetland 6 is a channelized ditch without a viable aquatic community; however, it is stated on page 10-11-1 that small fish and crayfish have been observed in this wetland. In addition, the blue heron has been observed in this wetland on occasion.

Mr. Bill Hill
Page Seven
April 9, 2001

Transfer of this wetland to the base storm water program will be considered; however, the source of water into this wetland needs to be identified.

Section 10.12, Wetland 63A

Metals (aluminum, copper, iron, and lead) exceed surface water criteria at sample location 63A2. Lead was identified as a surface water COPC. Probable sources include Site 14 (Dredge Spoils Disposal Area) and UST Site G (Building 2662).

I recommend that a confirmation surface water sample be collected and that groundwater data from sites adjacent to this wetland be reviewed to determine if an NFA decision is appropriate for this wetland.

Section 10.13, Wetland 48

DDD (2,600 ug/kg), DDE (620 ug/kg), and DDT (240 ug/kg) were detected at concentrations that exceed sediment benchmark levels in sample 4801. Sediment HQs were elevated for DDD (2131), DDE (299), and DDT (201).

No COPCs were identified for sediments and surface water; however, no formal ecological or human health risk assessment was conducted.

High DDT and metabolite concentrations should be further evaluated in order to determine nature and extent of the exceedence.

Section 10.14, Wetland 49

This wetland is apparently self-contained with Wetland 51 and surface water enters the wetlands only during rainy periods. Public access is restricted to Wetland 49 due to the proximity of Forrest Sherman Field and the base pistol range. I agree with a no further action decision for this wetland.

Section 10.15, Wetland 13

Twenty-one metals were detected in one surface water sample. The sample is reported to have a high turbidity (greater than 1,000 NTUs). Since there is no permanent standing water in this wetland and sample turbidity has

Mr. Bill Hill
Page Eight
April 9, 2001

probably contributed to the detection of metals, I agree with an NFA decision.

Section 10.16, Wetland 17

Site 1 (OU1) is the only site that may potentially impact Wetland 17. An NFA decision will be considered for Wetland 17; however, surface water monitoring may be required in conjunction with remedial activities at Site 1.

Section 10.17, Wetland 19

The location and conceptual surface water flow indicate that this wetland is probably accepting storm water runoff from Sherman Field during heavy rain events and directing the runoff toward Redoubt Bayou. Access to this area would be restricted due to the airfield.

The Partnering Team decided that an NFA decision for Wetland 19 was appropriate (September 18, 1996 Eco Meeting Minutes and September 19 and 20, 1996 Partnering Team Minutes). Since the wetland is receiving storm water runoff, it should be transferred to the base storm water program.

Section 10.18, Wetland 52

Based on the surface flow conceptual model this wetland is receiving storm water overflow from Wetland W1 and is possibly impacted from NAS Fuel Farm, Sherman Field, and UST Site 18 (Crash Crew Training Area).

The source of petroleum contamination has not been established therefore it is unclear if transfer of any portion of this wetland to the petroleum program is appropriate.

Section 10.19, Wetland 56

The wetland receives storm water runoff from Sherman Field and has an active NPDES permit for a storm water outlet. This wetland should be transferred to the base storm water compliance program.

Section 10.20, Wetland 57

The wetland receives storm water runoff from Radford Blvd. This wetland should possibly be transferred to the base storm water compliance program. The Navy should

Mr. Bill Hill
Page Nine
April 9, 2001

consider collecting a confirmation surface water sample in order to determine if NFA is appropriate for this wetland.

Section 10.21, Wetland 58

The wetland apparently receives storm water runoff from roads in the area, possibly Site 39 (Oak Grove Campground), and the area adjacent to Sherman Field. This wetland should possibly be transferred to the base storm water compliance program. The Navy should consider collecting a confirmation surface water sample in order to determine if NFA is appropriate for this wetland.

Section 10.22, Wetland 63B

Since this wetland is only receiving surface water runoff, an NFA decision is appropriate.

Section 10.23, Wetland 72

Aluminum, silver, and thallium exceeded their respective surface water criteria. HQs were elevated for aluminum (10), silver (62.8), and thallium (1.3) in surface water.

Wetland 72 receives discharge by storm water piping from Wetland W1 in the Sherman Field Area. The report states that no sediment nor surface water COPCs were identified. It is not clear where the source of silver originates from and how it was not considered a COPC.

Since this wetland is receiving storm water runoff from Sherman Field, the wetland should be transferred to the base storm water compliance program. The Navy should consider collecting a confirmation surface water sample in order to determine if NFA is appropriate for this wetland.

Section 10.24, Wetland 79

Wetland 79 no longer exists since being filled in with concrete debris around 1995 (approved by Corps of Engineers). No surface water samples could be taken. No sediment COPCs were identified in the assessment.

This area received storm water runoff at one time from parking areas near Sherman Field. There are no apparent risks at the site and since no suitable wetland habitat remains, I agree with a NFA decision for Wetland 79.

Mr. Bill Hill
Page Ten
April 9, 2001

Section 10.25, Wetland W2

Wetland W2 is also known as the Southeast Drainage Ditch. Since this wetland is receiving storm water runoff from Sherman Field, the wetland should be transferred to the base storm water compliance program.

Section 10.26, Wetland 25

Wetland 25 was identified as a reference wetland since there is no apparent connection to any CERCLA site and is located in an undeveloped area of the Base.

Section 10.27, Wetland 27

Wetland 27 was identified as a reference wetland since there is no apparent connection to any CERCLA site and is located in an undeveloped area of the Base.

Section 10.28, Wetland 32

Wetland 32 was identified as a reference wetland since there is no apparent connection to any CERCLA site and is located in an undeveloped area of the Base.

Section 10.29, Wetland 33

Wetland 33 was identified as a reference wetland since there is no apparent connection to any CERCLA site and is located in an undeveloped area of the Base.

Section 10.30, Wetland W1

Wetland W1 is a mowed swale that collects surface water runoff from the Sherman Field airfield and directs it off site by drain pipes to Wetland 52. Since this wetland is receiving storm water runoff from Sherman Field, the wetland should be transferred to the base storm water compliance program.

Section 10.31, Wetland 75

Wetland 75 was originally evaluated as a reference wetland; however, this status was later dropped. Since this wetland is receiving storm water runoff **from** a highway, the wetland should be transferred to the base storm water compliance program.

Mr. Bill Hill
Page Eleven
April 9, 2001

Summary

Based on my review of the data, the wetlands can be grouped in several ways. Wetlands Sa, 5b, 6 and 64 are associated with the OU2 Industrial Area. Wetlands 13, 12, 11, and 10a are associated with the area north of former Chevalier Field. Wetland 63A and 63B are potentially associated with the eastern portion *of* former Chevalier Field as well as Site 14 (Dredge Spoil Fill Area). Wetland 1, 18a, 18b, 17, 16, 15, and 3 are associated with Site 1. Wetlands 19A, 19B, W1, and 72 are associated with Sherman Field. Other wetlands have no apparent association with any site but serve as a storm water drainage pathway.

Many associated wetlands exhibit similar contaminants in sediment and surface water validating the surface water transport mechanism. Surface water standards are apparently exceeded in many wetlands; however sampling results may be biased due to sample turbidity.

The source of contamination may be historical for some wetlands; however, a continuing source is probable for other wetlands and should be addressed if remediation is to be achieved.

Some of the NFA recommendations are not supported without evaluation of existing soil and groundwater data from adjacent CERCLA sites; or collection of additional data.

If I can be of any further assistance with this matter, please contact me at (850) 921-9989.

Sincerely,

Joseph F. Fugitt

Joseph F. Fugitt, P.G.
Remedial Project Manager

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