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NCBC GULFPORT
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LETTER FROM U S AIR FORCE REGARDING CONSULTATIVE LETTER FOR DIOXIN CONTAMINATION NCBC GULFPORT MS
12/18/1985
U S AIR FORCE

DEPARTMENT OF THE AIR FORCE
USAF OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY (AFSC)
BROOKS AIR FORCE BASE, TEXAS 78235 - 5501

REPLY TO ATTN OF: EC

18 DEC 1985

SUBJECT: Consultative Letter, 85-188EQ1001MBC, Dioxin Contamination at Naval Construction Battalion Center (NCBC), Gulfport MS

TO: Commanding Officer
Naval Construction Battalion Center, Gulfport MS

1. Introduction:

a. We've received final results for the off-site dioxin contamination survey conducted under contract by Radian Corporation of Austin TX. Our conclusion is that, although there were detectable levels of dioxin contamination in the sediment and the biological samples collected from the NCBC drainage system, none of the sample results were high enough to be of concern.

b. This letter only addresses our monitoring for dioxin which might have been washed off of the old herbicide orange (HO) site. The Air Force Engineering Services Center (AFESC) has recently completed an extensive dioxin mapping study of the HO site proper. They will be reporting the results of that survey to you in the near future. If you have any questions on that part of the Air Force's support, please contact Major Tom Walker at AFESC at AUTOVON 970-4628.

2. Project Personnel:

Major Thomas R. Doane	USAFOEHL Project Officer
Mr Robert Wallace	Radian Corporation Project Director
Mr David Gancarz	Radian Corporation Survey Team Chief

3. Scope: The purpose of the off-site dioxin contamination survey at NCBC was to determine if appreciable quantities of dioxin were entering the drainage system. The immediate concerns were for welfare of personnel involved in renovation of the drainage system and for people consuming fish/crayfish caught in the drainage system. Sediment and biological samples were taken from 17 main sampling points in the NCBC drainage system. The first site was within the old Herbicide Orange (HO) storage site, and the last site was in Turkey Creek several miles downstream from its confluence with the base drainage system.

4. Findings and Discussion:

a. The sampling sites are shown on the attached map (Atch 1). Sediment samples were collected at all sites. Three separate sediment samples were collected at each of five sites (10 and 18-21) as stream transects to confirm the validity of the normal method of collecting only one sample. Sample results are presented in the attached tables (Atch 2).

b. There are no established standards for dioxin contamination of aquatic sediments, per se. The most appropriate number to use for comparison would be the 1.0 part per billion (ppb) guideline established by the Centers for Disease

Control for soil in residential areas. The only sample that exceeded this "guideline" was collected from Site 1, which was in the HO storage area.

c. Biological sampling was attempted at Sites 1-17, but due to scarcity of aquatic life, insufficient volume for analysis was collected at Sites 1, 5, 7, 8, and 10. The results of biological sampling are presented in Attachment 2.

d. The Food and Drug Administration established 25-50 parts per trillion (0.025-0.050 ppb) of dioxin as the action level for edible portions of fish. This guideline was exceeded at Sites 2 and 4. Both analyses were performed on homogenized samples of crayfish and minnows due to the scarcity of biological life. (We would expect results from such analyses to be higher than would the edible portion of a fish, i.e., a filet from a larger fish.) None of the off-base samples, which reflect where people might catch fish or crayfish to eat, exceeded the guideline.

e. As noted in the following table, the dioxin concentration decreases in both sediments and biological samples with greater distance from the original HO storage site.

Dioxin Results (In Downstream Order)

Sample No.	Sediment Conc.[1]	Biological Conc.[1]
1	4.7	NS[2]
2	0.27	0.440
3	ND[3]	0.0096
4	ND	0.080
19	ND,ND,Tr(0.066)[4,5]	NS
5	ND.	NS
20	ND,ND,ND	NS
6	ND	0.0032
21	0.18,Tr(0.057),Tr(0.062)	NS
7	Tr(0.076/0.076)[6]	NS
10	Tr(0.077),ND,ND	NS
8	Tr (0.085)	NS
9	ND	0.024
12	ND/0.11	0.014
15	ND	0.016
16	NA[7]	0.012
17	NA	0.0072

[1]Concentration in parts per billion.
[2]Not Sampled
[3]None detected
[4]Trace
[5]Replicated sample
[6]Replicated analysis
[7]Not analyzed (previous sample negative)

f. The transects of three samples each at five sites showed reasonably good correlation. We feel this indicates taking a single sample from each sampling site is descriptive of the actual conditions at that site.

5. Recommendations:

a. We have no concerns about the health of individuals involved in renovation of the drainage system. This decision is based on the very low levels of dioxin contamination combined with the fact personnel will be working with wet materials not easily respired.

b. We similarly have no concerns regarding people consuming fish/crayfish caught in the drainage system. The low levels of dioxin contamination combined with the scarcity of organisms make it virtually impossible for anyone to consume a dioxin dose of any significance.

c. We plan to perform a similar survey in early spring. Although we feel the data collected to date, as a result of sampling by AFESC/RDVW and this effort by Radian Corp, support our conclusions of no significant adverse effect on the off-site environment, the numbers are high enough to justify continued surveillance.

d. We have recommended to AFESC/DEV, through HQ USAF/SG, the sedimentation basins in the NCBC drainage ditch be renovated and maintained. Such actions, which should be completed in the near future, will help assure the old HO site does not contaminate the drainage system to any appreciable extent.

6. If you have any questions about this subject, please contact Major Tom Doane at AUTOVON 240-3667.

Darryl T. Markland

DARRYL T. MARKLAND, Col, USAF, BSC
Chief, Consultant Services Division

2 Atch
1. Map of Sampling Areas
2. Analytical Results

cc: HQ USAF/SGES
HQ USAF/LEEVP
HQ AFESC/DEV
CODE 470, NCBC (Public Works)
HQ AFSC/SGPB
OL AD, USAFOEHL

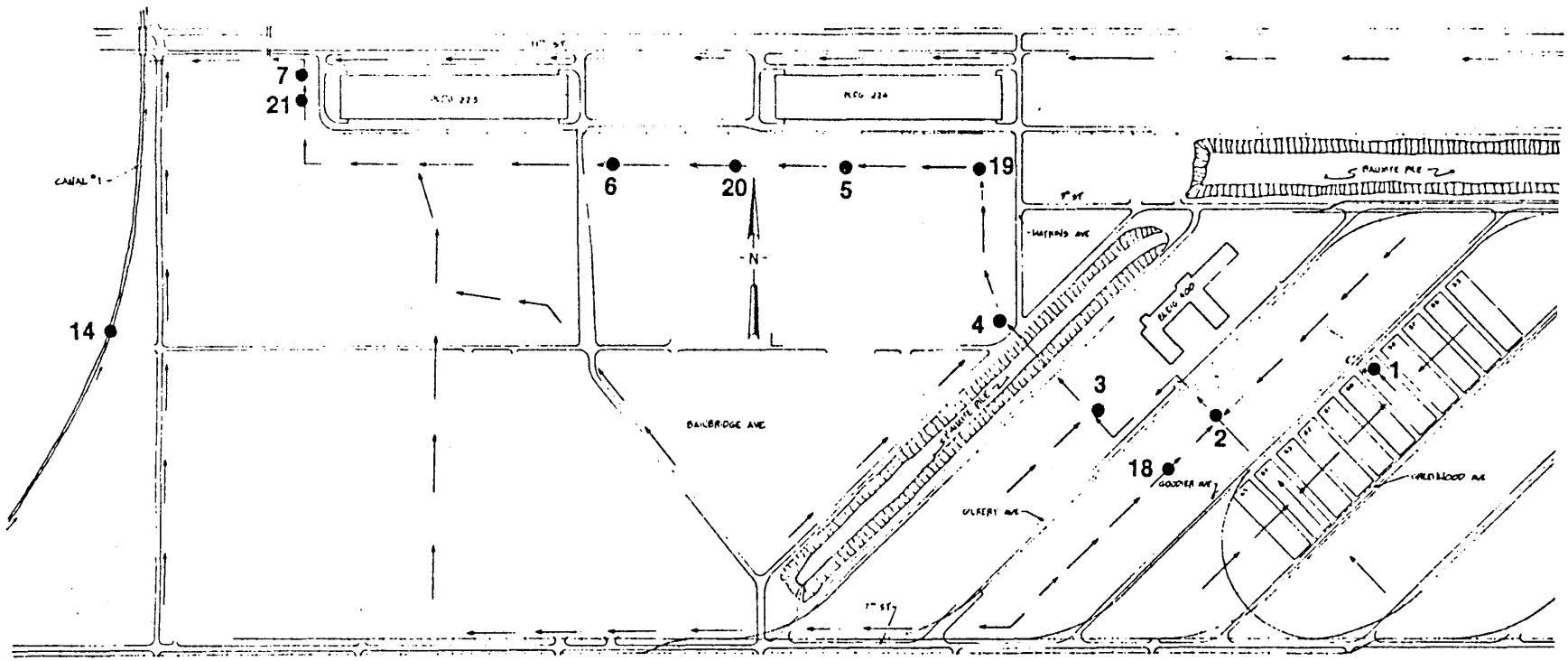

Figure 1. On-Base Sampling Sites.

RADIAN CORPORATION

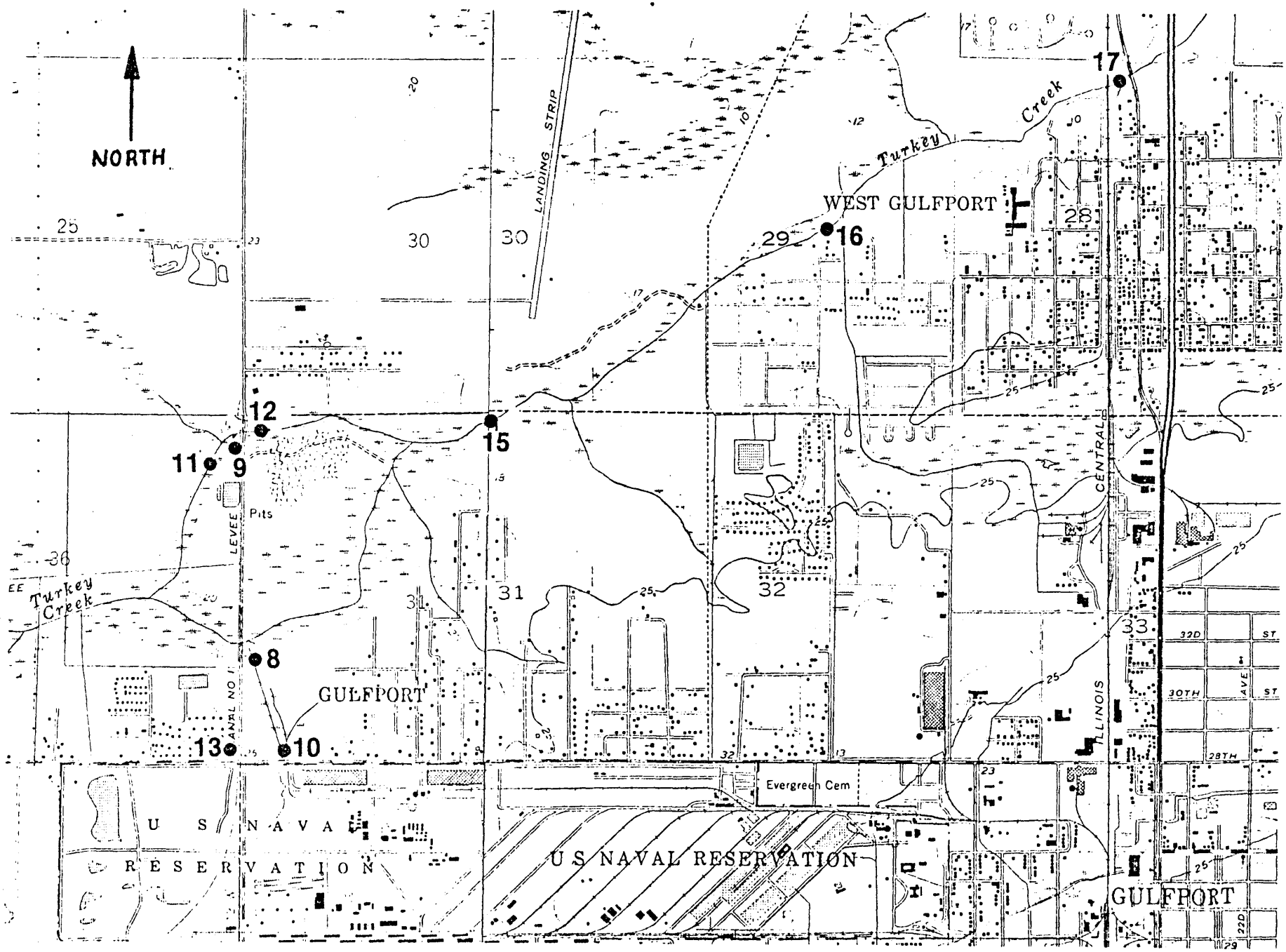

Figure 2. Off-Base Sampling Sites.

TABLE 1

ANALYTICAL RESULTS OF SEDIMENT SAMPLES TAKEN BY RADIAN PERSONNEL AT GULFPORT NCBC

Site No.	Field No. No.	Radian Analytical No.	2,3,7,8-TCDD ng/g	%Recovery (1) $^{37}Cl_4$-2,3,7,8-TCDD
1	SS-1	8507-A43-06	4.7	106
2	SS-2	8507-A43-07	0.27	101
3	SS-3	8507-A46-02	ND(2)	108
4	SS-4	8507-A46-01	ND	107
5	SS-5	8507-A38-01	ND	94
5	SS-5 (3)	8507-A46-14	ND	108
6	SS-6	8507-A38-02	ND	120
7	SS-7	8507-A38-03	0.076	93
7	SS-7 (4)	8507-A38-03	0.076	95
8	SS-8	8507-A38-04	0.085	100
9	SS-9	8507-A38-05	ND	108
10	SS-10A	8507-A38-06	0.077	103
10	SS-10B	8507-A46-07	ND	102
10	SS-10C	8507-A38-07	ND	108
11	SS-11	8507-A38-08	ND	114
12	SS-12	8507-A38-09	ND	107
12	SS-12 (5)	8507-A38-09 MS	0.11	104
13	SS-13	8507-A38-10	0.11	98
14	SS-14	8507-A38-11	ND	108
15	SS-15	8507-A38-12	ND	105
16	SS-16 (6)	-	-	-
17	SS-17 (6)	-	-	-
18	SS-18A	8507-A43-08	ND	96
18	SS-18B	8507-A46-03	ND	106
18	SS-18C	8507-A43-09	ND	99
19	SS-19A	8507-A46-08	ND	101
19	SS-19B	8507-A46-12	0.066	111
19	SS-19C	8507-A46-13	ND	101

Continued

TABLE 1 (Continued)

Site No.	Field No. No.	Radian Analytical No.	2,3,7,8-TCDD ng/g	%Recovery (1) $^{37}Cl_4$-2,3,7,8-TCDD
20	SS-20A	8507-A46-11	ND	101
20	SS-20B	8507-A46-10	ND	96
20	SS-20C	8507-A46-09	ND	96
21	SS-21A	8507-A46-04	0.18	106
21	SS-21B	8507-A46-05	0.057	101
21	SS-21C	8507-A46-06	0.062	107
-	-	8507-A38-BLK	ND	98
-	-	8507-A46-BLK	ND	99

(1) Each sample was spiked at 0.2 ng/g of $^{37}Cl_4$-2,3,7,8-TCDD prior to extraction.

(2) ND = Not Detected; estimated detection limit for each sample is 0.050 nglg.

(3) Duplicate field sample.

(4) Duplicate injection of extract on different days.

(5) Matrix Spike. Previously analyzed sample was re-aliquoted, spiked at 0.10 ng/g with 2,3,7,8-TCDD, extracted, and analyzed.

(6) Sample not analyzed based on non-detection results from Site 15.

TABLE 4

PRELIMINARY ANALYTICAL RESULTS OF BIOLOGICAL SAMPLES
TAKEN BY RADIAN AT GULFPORT NCBC

Field No.(1)(2)(3)	Radian Analytical No.	Matrix Type	2,3,7,8-TCDD (4) pg/g (pptr)	% Recovery (5) $^{37}CL_4$-2,3,7,8-TCDD
Bio 2	8508A11-14	Crayfish/Minnows	440.	108
Bio 3	8508A11-13	Turtle	9.6	100
Bio 4	8508A11-12	Crayfish/Minnows	80.	101
Bio 6	8508A11-11	Perch	32.	94
Bio 9	8508A11-04	Crayfish/Minnows	23.	96
Bio 9 (6)	8508A11-04	Crayfish/Minnows	24.	99
Bio 11	8508A11-06	Minnows	14.	110
Bio 12	8508A11-07	Water Beetles/ Minnows	14.	115
Bio 13	8508A11-08	Crayfish/Minnows/ Tadpoles	19.	107
Bio 14	8508A11-09	Frog/Perch/Crayfish	4.7	99
Bio 15	8508A11-03	Water Beetles	16.	103
Bio 16	8508A11-02	Minnows/Perch	12.	105
Bio 17	8508A11-01	Minnows/ Baby Shrimp	7.2	92

(1) Field Numbers correspond to site locations at Gulfport, NCBCa.

(2) No samples were taken at sites 1,5,8 or 10 due to scarcity of aquatic life at those sites.

(3) Sample collected at Site 7 was less than 35 gm wt. necessary to achieve detection limit.

(4) Estimated detection limit for biological matrices is sample dependent averaging 5.0 pg/g or better.

(5) Each matrix spiked with 20 pg/g of $^{37}CL_4$-2,3,7,8-TCDD prior to extraction.

(6) Duplicate injection of same extract on different days.