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82 Pages

OPR: J42E
MR SEA/54715
30 JULY 1993

TALKING PAPER
ON
POSSIBLE TOXIC CONTAMINATION AT CAMP KINSER

The following actions, regarding the possibility of toxic dumping off MSA - Urasoe, were tasked by J01 on 8 July 93:

1. Confirm. There is no evidence that toxic dumping occurred off MSA - Urasoe. However, there is evidence of environmental contamination by heavy metals and pesticides caused by past hazardous material storage practices. A chronology of events follows:

CHRONOLOGY

- From 1945 to 1973, the US Army stored large amounts of hazardous materials/wastes in the open along the shoreline at MSA (now Camp Kinser).

- Dec 72: CINCUSARPAC directed reporting of all Okinawa excess chemicals to US Army General Material Parts Center.

  -- Chemicals were primarily retrograde shipments from Viet-Nam and those declared excess due to the phase down of depot operations.

  -- Chemicals were stored in the open lumber yard next to the beach which covered a total storage area of approximately 500,000 square feet (encl 1).

  -- Chemicals included insecticides, rodenticides, herbicides, inorganic and organic acids, alkalis, inorganic salts and organic solvents, and vapor degreasers.

  -- US Army Base Command Okinawa (USARBCO) was unable to dispose of chemicals either by shipment to CONUS or by sales locally, thus containers deteriorated in the open storage conditions.

- 1 Apr - 31 Aug 73: A project was initiated to cleanup the MSA shoreline by the Joint Environmental Investigative Committee which included the Okinawa Prefectural Government (OPG) and US Army Pacific Environmental Health Agency (USAPACEHEA) (encl 2).

- 19 to 20 Dec 74: A fish kill took place directly offshore from the MSA lumber yard.

- 14 - 16 Jan 75: Dead fish were found along the MSA shoreline.

- 17 Jan 75: Joint investigation was conducted by Urasoe Municipal Office and Urasoe Fishery Cooperative Association (encl 3).

- 22 Jan 75: The incident was studied and reported by USAPACEHEA.

  -- USAPACEHEA indicated contamination involving pesticides such as malathion, chlordane, diazinon, DDT, dieldrin, dioxin (agent orange component), and high concentration of PCB's, particularly aroclor 1260 (encl 4).

- 9 Jan - Feb 76: USAPACEHEA documented the investigation and initial cleanup. The action was taken by US Army Garrison Okinawa (encl 5).

  -- Cyanide compounds were neutralized, flushed into the sanitary sewer system, and the sludge was buried at the lot across from the MSA theater.

  -- Ferric chloride (27,800 pounds) was buried across from the MSA theater in a 30 ft long by 10 ft wide and 5 ft deep trench.

  -- Inorganic acids and alkalis were neutralized and flushed over the lumber yard grounds.

  -- Pesticides were repackaged and buried at a landfill site. Note - coordinates match current Kin dump site.

- Nov 77: A joint study was conducted by the OPG and the USAPACEHEA (encl 2).

  -- The results showed high concentrations of heavy metals but low concentrations of pesticides.

- 15 Jun - 1 Sep 1978: USAPACEHEA letter summarized the necessity for continued sampling and analyses of the shore line area with respect to pesticide levels in the soil and water (encl 6).

- Sep 1984: The Navy Hospital, Okinawa (NAVHOSP), was asked

to determine acceptability of the offshore area at Kinser for recreational swimming.

-- NAVHOSP recommended that further sampling be conducted (encl 7).

- Feb - 3 Jun 85: Additional soil samples were analyzed for dioxin and tested negative, however, the shoreline remained closed to recreational activities as a precaution (encl 8).

- Oct 86: Another fish kill took place offshore from Camp Kinser.

-- It resulted from excavation associated with Urasoe City port facility construction.

-- Analysis of soil, water and fish contained elevated levels of pesticides chlordane and dieldrin, PCB contaminated oil and heavy metals (encl 9).

- Nov 89: Naval Facilities Engineering Command, Pacific Division (PACNAVFACENGCOM) was requested to investigate the suitability of the Kinser beach area for recreational use.

- Jan 90: PACNAVFACENGCOM stated that a detailed study was needed at a cost of more than $500,000 (encl 10).

- May 90: An Environmental Assessment was made by PWO, MCB Butler, for subject area (encl 11).

- Jan 91: An Environmental Summary was drafted by PWO, MCB Batler, for subject site (encl 12).

2. Develop strategy, after facts are in, to notify GOJ. TBD

3. After picture clears, develop Q & A's. The following potential questions have been identified; the answers will be formed as the situation develops.

Q1: When did you find out?

A1:

Q2: What did you do when you find out?

A2:

Q3: What are you doing to ensure that it won't happen again?

A3:

Q4: What types of toxic chemical might have been released into the soil and into the water?

A4:

Q5: What danger to the public do these chemicals cause?

A5:

Q6: What is the USG doing to product the Okinawan people from these chemicals?

A6:

4. Confirm, - Year, - Type Toxin, - Quantity.

YEAR	TYPE TOXIN	QUANTITY
prior to 1973	Arsenic	Unknown
ditto	Cadmium	Unknown
ditto	Chlordane	Unknown
ditto	Chromium	Unknown
ditto	Cyanide	Unknown
ditto	DDE	Unknown
ditto	DDD	Unknown
ditto	DDT	Unknown
ditto	Dieldrin	Unknown
ditto	Diazinon	Unknown
1976	Ferric Chroride	27,800 lbs
prior to 1973	Lead	Unknown
ditto	Lindane	Unknown

ditto	Malathion	Unknown
ditto	Mercury	Unknown
ditto	PCB	Unknown

5. Summary Report.

BACKGROUND.

- Based upon official documentation (encls 1 - 12) the following areas were contaminated with heavy metals and pesticides by the Army between 1945 and 1973:
  - -- The water area off MSA (now Camp Kinser)
  - -- The Camp Kinser shoreline
  - -- The old MSA lumber yard & Chemical Field Storage Area
- The following areas were used as local disposal sites during clean-up operations and may be contaminated:
  - -- The old lime pit across from the MSA theater
  - -- The current Kin dump site
  - -- The old MSA lumber yard
  - -- The old MSA 540 yard
- Three fish kills have been reported in the water area off MSA: Dec 74, Jan 75, and Oct 86.
- From 1973 to 1986, numerous soil, water and fish samples were taken in the vicinity of MSA. All were superficial.
- In 1990, PACNAVFACENGCOM estimated that a detailed study of the area would cost more than $500 K (encl 10).
  - -- High cost of study due to large size of area and technical detection difficulty

DISCUSSION.

- Defense Environmental Restoration Account (DERA) funds cannot be used to perform investigation or remediation in foreign countries.
  - -- Survey efforts must be supported by either service O&M funds or OSD environmental funds.
  - -- Remediation efforts would have to be funded under the FIP.

- Preliminary environmental survey efforts (under $50 K) are normally available through service channels.

  -- If preliminary survey results indicate a more extensive survey is required, COMUSJAPAN would support service request for OSD environmental funds through USCINCPAC.

- Detailed environmental surveys (which the PACNAVFACENGCOM recommendation certainly is), would have to be OSD funded.

  -- COMUSJAPAN would support service efforts to obtain OSD environmental funding through USCINCPAC.

- Should environmental survey results indicate clean-up actions are required, USFJ would request GOJ fund any remediation efforts through the FIP.

- Environmental surveys of past US hazardous waste dump sites, no longer on US controlled SOFA property, can not be funded by US O&M funds. Category "E" FIP funding should be pursued to conduct these surveys.

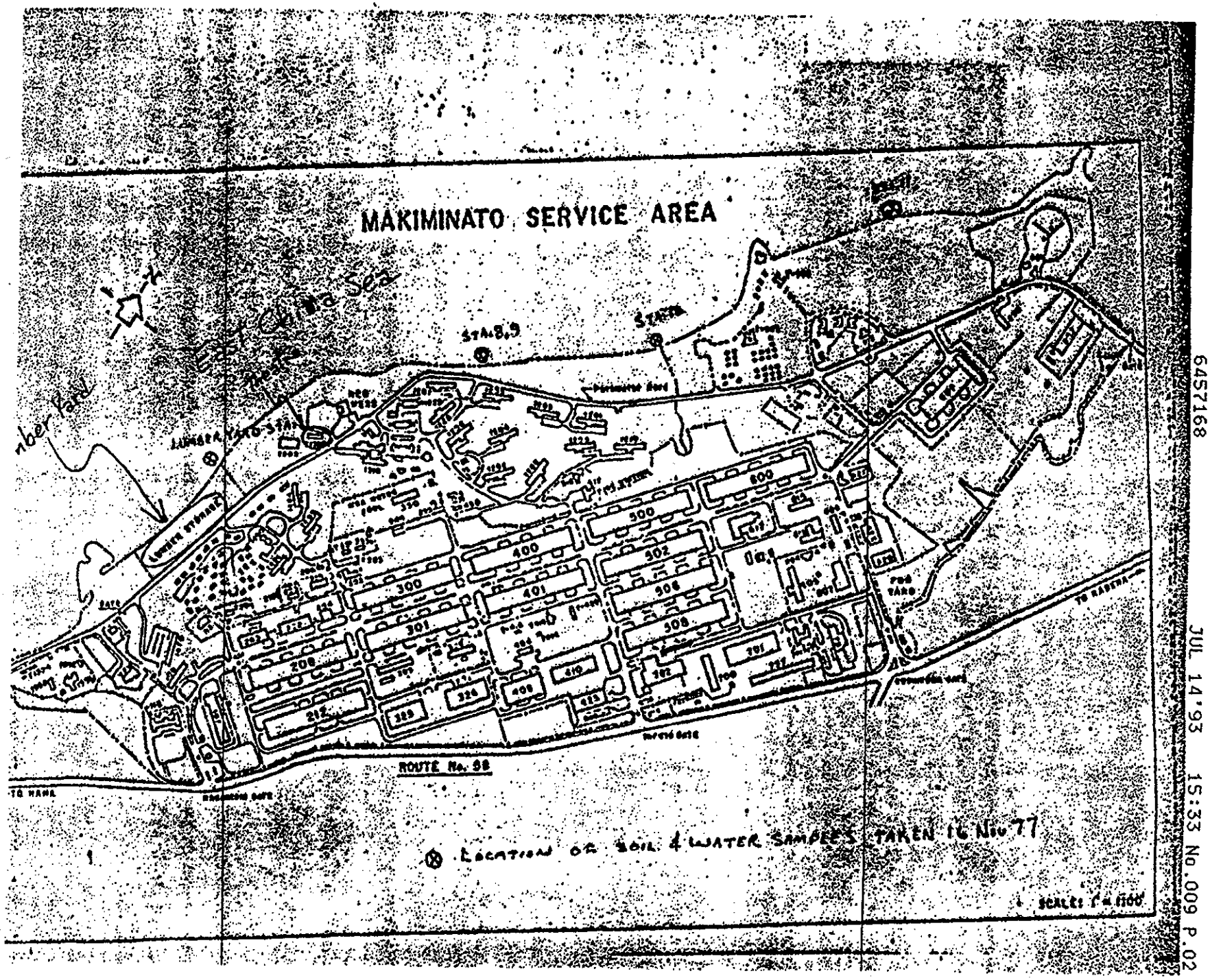
CONCLUSIONS.

- All environmental surveys to date have been cursory.

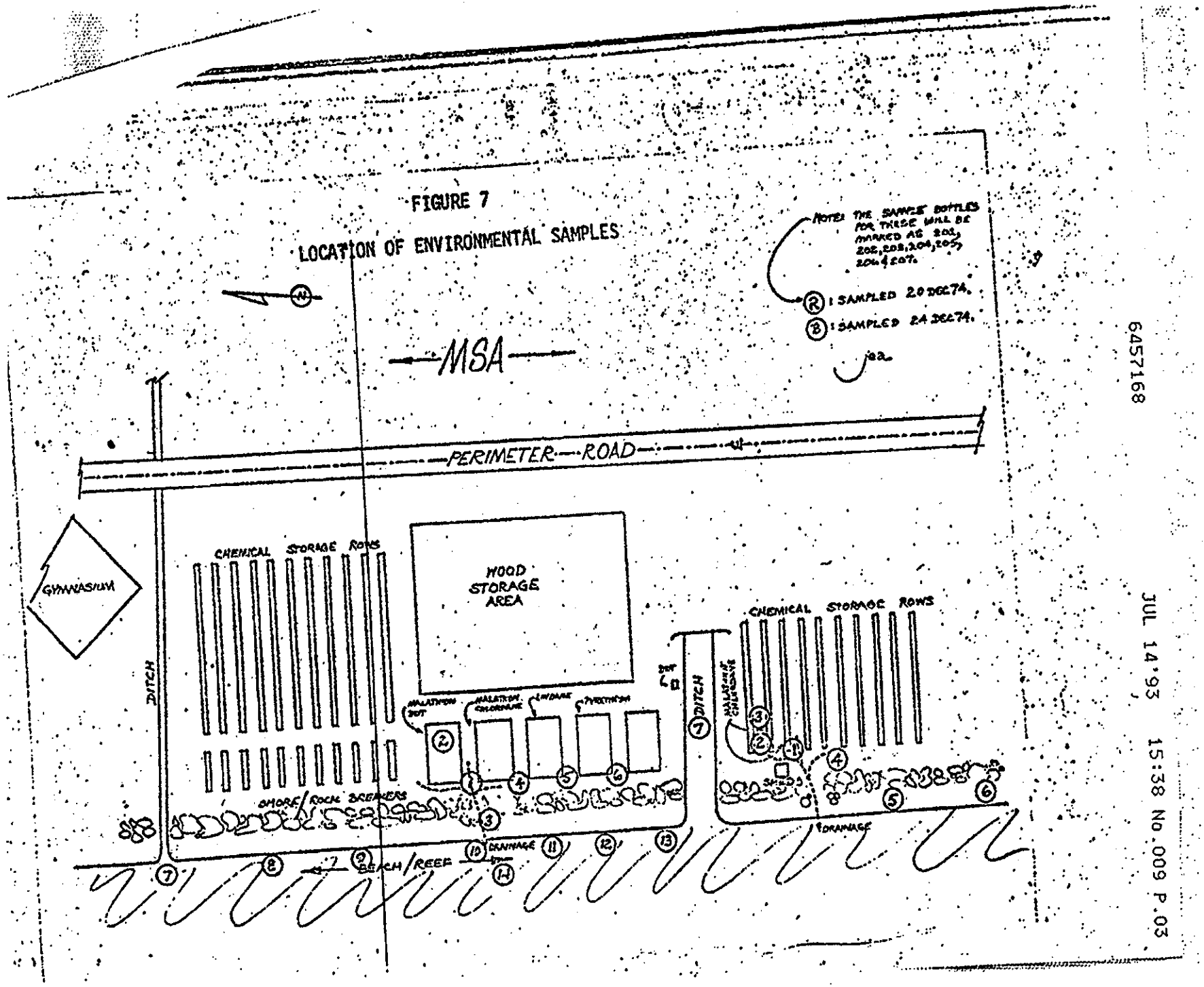
- Extensive sampling is needed to determine the actual extent of contamination, if any, remaining at Camp Kinser and the Kin dump.

- Survey may be just the "down payment" on eventual remediation actions, which will be predicated on the outcome of the site investigations.

Encl 1



⊗ LOCATION OF SOIL & WATER SAMPLES TAKEN 16 NOV 77



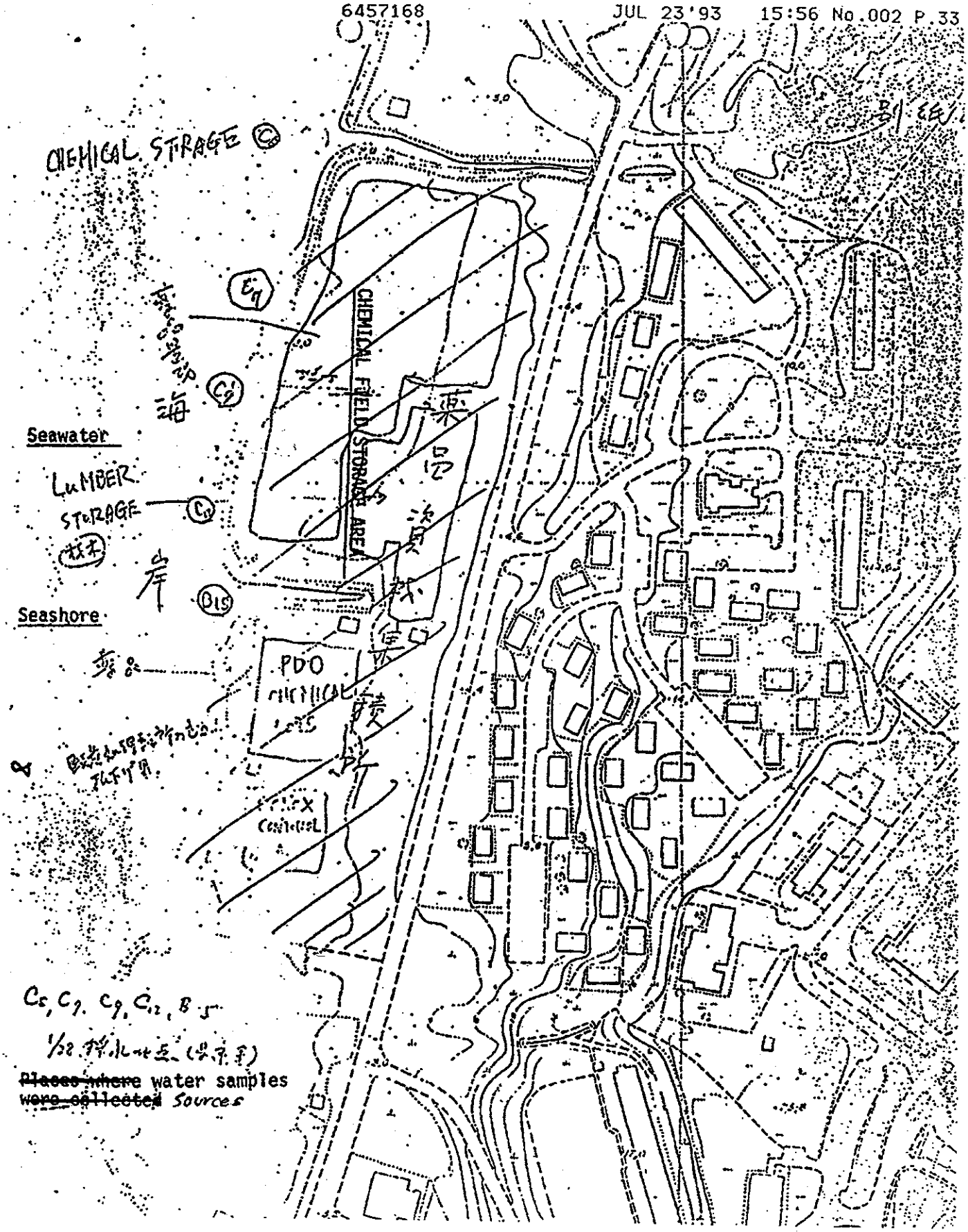

CHEMICAL STRAGE
CHEMICAL FIELD STORAGE AREA
Seawater
LUMBER STORAGE
Seashore
PDO
C5, C4, C3, C2, B-5
1/28
Places where water samples were collected Sources

FIGURE 2 - AERIAL VIEW OF MSA IN JULY 1975

FIGURE 3 - MSA LUMBER YARD & CHEMICAL STORAGE AREA
PRIOR TO CLEAN-UP OPERATIONS BEING INITIATED

FIGURE 5 - VIEW OF RUSTY & DETERIORATED CONTAINERS IN MSA LUMBER YARD

Encl 2

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY GARRISON, OKINAWA
APO SAN FRANCISCO 96331

Nov 1977

GAROCS

MEMORANDUM FOR RECORD

SUBJECT: Joint Sampling of Water and Soil Along MSA Shoreline

1. A project was initiated in 1973 to clean up the MSA shoreline which had been subject to pollution from a variety of sources over a period of years (details are contained in Environmental Engineering Project #04-1410-0830, subject: Waste Water Pollution Control Project Machinato Service Area, 1 Apr - 31 Aug 1973). The project was conducted under the auspices of the Joint Environmental Investigative Committee. Joint sampling of several points along the MSA shoreline has been conducted annually since 1973 to monitor the effects of the clean up effort. The sampling of water and soil has been conducted jointly by representatives of the Okinawa Prefectural Government (OPG), Environmental Health Dept, Anti-pollution Section and representatives of the US Army Pacific Environmental Health Engineering Agency (PAC-EHEA).

2. Sampling has indicated that the initial clean up project was effective and that the area continues to improve as the forces of nature act upon those pollutants that the clean up effort could not/did not remove.

3. The results of the sampling performed by OPG in July 1976 are currently being translated and will be attached to this MFR upon completion.

4. A request from OPG was received by Mrs. Fanner, PAO, on 21 Oct 77 to sample the shoreline in MSA for 1977. The request was approved by General Goodwin, and the sampling was scheduled for 17 Nov 77. A message, DTG 070425Z NOV 77, was sent to USARJ requesting that PAC-EHEA provide technical assistance. This was approved, and CPT Jackson and SFC Larson were dispatched to USAGO to perform this service.

5. Due to an imminent strike scheduled for 17 Nov 77, USAGO suggested an alternate date for the sampling, 16 Nov 77. This was accepted by OPG.

6. At 0930, 16 Nov 77, three OPG personnel (Mr. Kazunari Miyagi, C, Anti-pollution Activity; Mr. Tsuneo Takara; and Mr. Teijyu Nakamura) were met at MSA by Mrs. Fanner; Mr. Nakamura, PAO; Mr. Holder, IE; CPT Jackson;

GARODC
SUBJECT: Joint Sampling of Water and Soil Along MSA Shoreline

and SFC Larson, and accompanied to the four locations (shown at Incl 1) where the sampling was done, with as nearly identical as possible samples drawn for both OPG and PAC-EHEA. Both water and soil samples were taken from the outfall areas. OPG will analyze their samples and provide results to USAGO. OPG expects to complete the analysis in April 1978. PAC-EHEA will split their samples. Each sample will be analyzed by both PAC-EHEA and Edgewood Arsenal. The results of these analyses are also expected to be completed in a similar time frame as required by OPG.

7. The general atmosphere of the joint effort reflected a spirit of cooperation and professional respect.

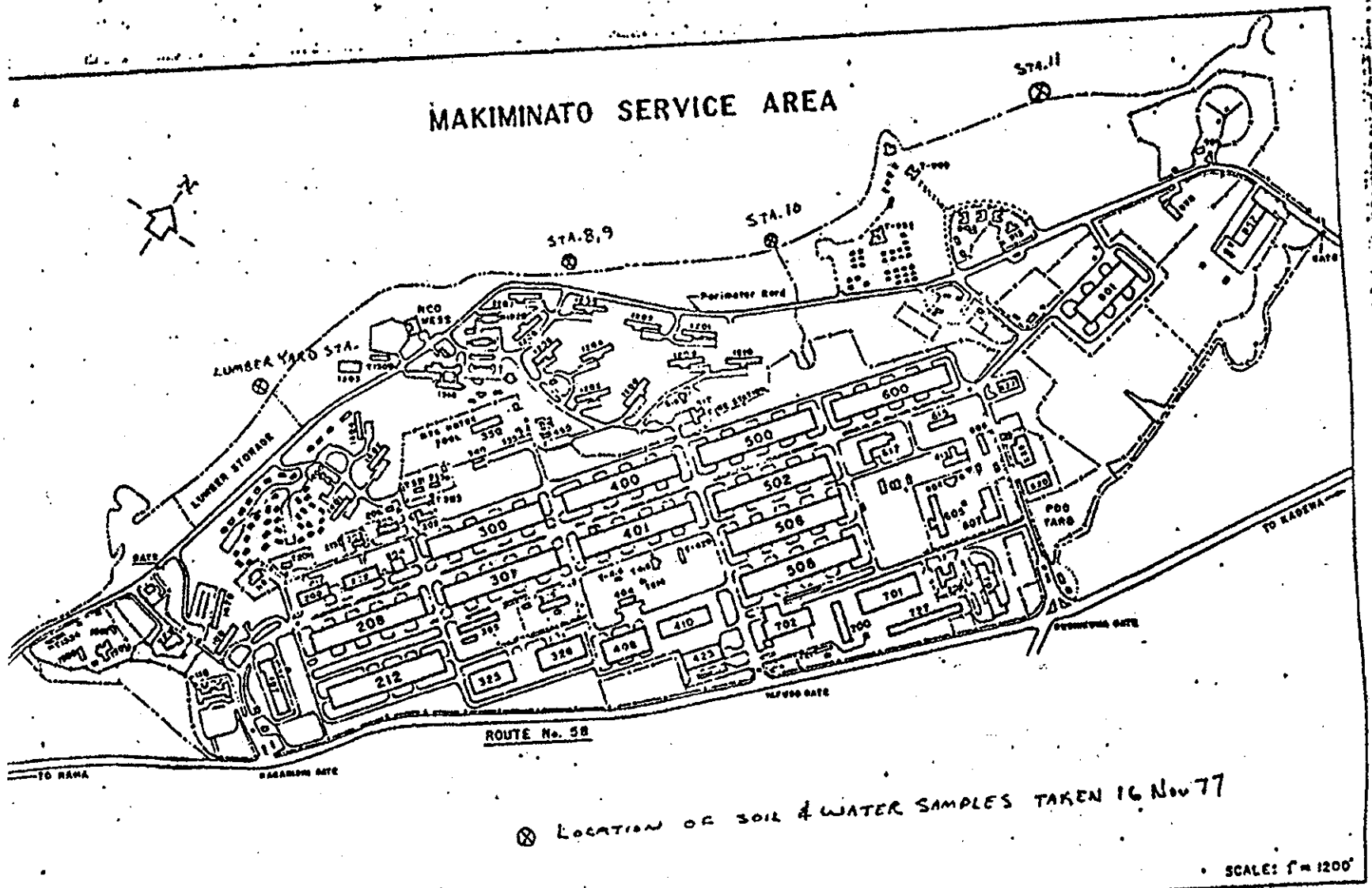
8. Mr. Miyagi, as OPG spokesman, expressed pleasure that the area looked better each year and thanked the US Army for its efforts. He specifically stated that they now see fish in areas where there had been none for several years. He expressed the OPG desire to continue the annual monitoring of the area. This will help them document the effects of nature in mitigating the deleterious effects of the specific pollutants identified along the MSA shoreline.

9. A statement of the PAC-EHEA effort will be included in the quarterly Command Health Report.

Alfred D. Holder

ALFRED D. HOLDER
Industrial Engineer

2 Incl
1. Sampling Locations
2. Sampling Results



⊗ Location of soil & water samples taken 16 Nov 77

SCALE: 1" = 1200'

ENVIRONMENTAL INVESTIGATION ON OR AROUND MILITARY INSTALLATIONS - (fishes & shellfishes)

Unit: ppm

NO	Sample	Time of collection	Place of collection	Total mercury	Cadmium	Lead	Arsenic	PCB	Remarks
1	Bora (gray mullet)	25 Aug 76	Seashore at Lumber yard FSA	<0.01	<0.01	<0.05	<0.2	1	
2	Aka-fuefuki (lethrinus haematcrterus)	"	"	0.03	<0.01	<0.05	<0.2	0.3	
3	Kibire-hirasaji (caranx sp.)	"	"	0.03	<0.01	<0.05	<0.2	0.1	
4	Gena-aigo (siganidae)	"	"	<0.01	<0.01	<0.05	<0.2	0.3	
5	Aka-aigo (sirnus fuscescens)	"	"	<0.01	<0.01	<0.05	<0.2	0.2	
6	Kamasu (saury-pike)	"	"	0.09	<0.01	<0.05	3.3	0.9	
7	Harisenbon (porcupine-fish)	"	"	0.05	<0.01	0.06	1.0	-	Measurement of PCB was not performed due to short of sample.
8	Dorokui	"	"	0.02	<0.01	0.06	0.8	9	
9	Kurahaci (stephanolepis cirrhifer)	"	"	0.05	<0.01	0.05	7.6	0.3	
10	Kani (crab)	"	"	0.11	<0.01	0.12	0.4	0.3	
11	Bora (gray mullet)		Inland sea of Haneji	<0.01	<0.01	<0.05	1.4	0.01	as reference
12	Aigo (siganidae)		"	<0.01	<0.01	<0.05	0.3	<0.01	"
13	Minami-kurodai (black porgy)		"	0.05	<0.01	<0.05	1.8	<0.01	"
14	Kotobiki (theranon jarbua)		"	0.03	<0.01	0.15	0.9	<0.01	"
15	Dorokui		"	0.01	<0.01	<0.05	0.5	<0.01	"

FINDINGS IN THE EXAMINATION OF SAMPLES COLLECTED ON OR AROUND MILITARY INSTALLATIONS

Sample Collected by: Pollution Control Branch, Environment & Health Department, Okinawa Prefectural Government

Analyzed by: Pollution & Hygiene Institute, Okinawa Prefectural Government

vestigation for Monitoring Environment on or ound Military Installations (sludge)

Place of Collection \ Item Analyzed / Date of Collection		Total mercury	Total Chromium	Cadmium	Lead	Arsenic	PCB	Organophosphoric compounds for agri	Organochloric Compounds for Agricuture					
									Dieldrin	B-BHC	DDE	OP-DDT	PP-DDT	PP-DDD
ff mouth of chikazabaru iver	76.6.1	0.0513	23.5	0.229	16.3	6.28	0.007	ND	0.005	0.002	0.007	0.007	0.002	0.007
eashore at mby Air Field	"	0.0105	26.5	0.158	13.4	4.12	0.018	ND	0.006	0.001	0.014	0.008	0.004	0.004
eashore at Navy apital	"	0.0589	29.4	0.0778	7.79	7.04	0.051	ND	0.024	0.02	0.024	0.026	0.015	0.05
eashore at recla- d land, Chatan	"	0.0175	14.7	0.0762	3.13	2.63	ND	ND	0.005	0.002	0.017	0.009	0.006	0.004
ff mouth of ebo River	"	0.0083	42.3	0.508	42.6	12.53	0.135	ND	0.005	0.002	0.02	0.008	0.004	0.006
ZA St 8.9	76.7.26	0.294	52.9	2.82	230.0	6.23	5.98	ND	0.08	0.1	0.06	0.21	0.16	0.43
ZA St 10	"	0.354	78.6	3.83	69.4	6.88	0.736	*	0.03	0.09	0.03	0.1	0.01	0.13
ZA St 11	"	0.321	15.1	0.271	33.7	1.32	0.026	ND	0.02	0.01	0.015	0.01	0.02	0.02
ZA or Yard PSA	"	0.090	22.9	0.183	38.1	3.88	0.35	ND	0.2	0.02	0.03	0.04	0.04	0.08
outh of Gobusoka iver	77.2.17	0.170	22.6	0.138	11.7	6.27	ND	ND	0.0001	ND	ND	0.0001	0.004	ND
outh of Kanachi- ibana River	"	0.0782	21.2	0.171	11.3	11.0	ND	ND	0.0001	ND	ND	0.0001	0.004	ND
ea area near to Kanachihashi ridge	"	0.0254	12.8	0.102	4.76	7.35	ND	ND	0.0001	ND	ND	0.0001	0.004	ND
Minimum - Maximum		0.0105- 0.354	12.8- 78.6	0.0778- 3.83	3.13- 230.0	1.32- 12.53	ND- 5.98	ND-	0.0001- 0.2	ND- 0.1	ND- 0.06	0.0001- 0.21	0.004- 0.16	ND- 0.43
Averaged Value		0.0872	30.2	0.724	38.43	6.40	0.608		0.0312	0.0205	0.0180	0.0348	0.0228	0.0609

FINDINGS IN THE EXAMINATION OF SAMPLES COLLECTED ON OR AROUND MILITARY INSTALLATIONS

Environmental investigation on or around military installations (sea area) - 1977

Samples collected by: Pollution Control Branch, Environment Health Department, Okinawa Prefectural Government.
Analyzed by: Pollution & Hygiene Institute, Okinawa Prefectural Government.

Installations / Date / Item measured	Camp Zukeran		Camp Kuwae		Kadena AB	Makiminato Supply Depot				Sea area for ref.
	1 Jun	1 Jun	1 Jun	1 Jun	1 Jun	26 Jul	26 Jul	26 Jul	26 Jul	17 Feb
Amount discharged (m3/day)										
Place of collection	Offshore Ishikawabaru	Hamby Air Field	Seashore Navy Hosp	Seashore Chatan-son	Offshore Daido-gawa	St 89/MSA	St 10/MSA	St 11/MSA	Lumber yard MSA	Mouth of Gabusoka-gawa
Weather	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Cloudy
Time of collection	13:45	13:30	11:45	11:30	10:45					11:45
Depth of water (m)	0.7	1	0.5	0.7	1	0.5	0.5	0.5	0.5	0.9
Depth of collection (m)	0.6	0.9	0.4	0.5	0.9	0.4	0.4	0.4	0.4	0.8
Low tide (time)						0027/1320	0027/1320	0027/1320	0027/1320	0026/1256
High tide (time)						0615/1926	0615/1925	0615/1926	0615/1925	0719/1805
Temperature (°C)	26	25	25	25	26	31.5	31.5	31.5	31.5	15
Water temperature (°C)	26	25	25	26	26	31	32.5	30	31.5	15.5
Color	Colorless	L. yellow.	L. yellow.	Colorless	L. yellow	Colorless	Colorless	Colorless	Colorless	Colorless
Odor	None	None	None	None	None	None	None	None	None	None
Transparency (cm)	30/above	27.5	15.5	30/above	21.5	30/above	30/above	30/above	30/above	30/above
pH	5.3	6.1	6.1	6.3	6.3	6.2	6.4	6.3	6.5	6.4
DO (ppm)	11.0	7.5	6.0	7.3	9.4	6.0	9.3	7.2	10.7	7.6
BOD (ppm)		C		5	5			6		
COD (ppm)	2.2	3.6	5.4	2.6	2.7	2.0	1.4	1.0	1.2	2.6
SS (ppm)										
Coliform Gr (cm3)	7	2.1 x 10	3.1 x 10⁴	0	1.4 x 10⁴	0	0	0	0	0
[illegible] (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyanide (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total mercury (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total chromium (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
[illegible] (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
[illegible] (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
[illegible] (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Organochloric compounds for agriculture (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Organophosphoric compounds for agriculture (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Health items

Remarks:

Encl 3

Incidents involving chemcials drained from the Makiminato Service Area

The rain in the previous day made Malathion drain from Field Chemical Storage Area and dead fish were found at the seashore off the Makiminato Service Area.

14 Jan - 16 Jan 1975	Many dead fish were found at the seashore off the Makiminato Service Area
17 Jan 1975	Joint investigtion was conducted by Urasoe Municipal Office and Urasoe Fishery Cooperative Association

Investigation Summary

1. On-site Map — As attached

2. Kinds of chemicals found in the area

   Malathion, Acetic Acid, Oil, Battery Liquid, Developing Solution, and other various chemicals (Further information was expected from U.S. Forces but it was not available).

3. Vessels and Quantity

   Drums cans (150 cans containing 550 gallons, 40 cans containing 5 gallons)

   Malthion contained in wooden boxes, polyethylene bags and container, glass bottles and cans but quantity in each container was not identified.

4. Chemicals leaked from the rusted vessels contaminated the area. Marks of leaked chemical meet eyes at every turn. The site is located about 20m from the seashore and it is conceivable that chemicals percolated downward through the soil and drained into the sea.

5. Material collected: Soil, dead fish, seawater, seaweed. Chemical analysis for these materials is shown in the attached paper.

21 Jan 1975 Deputy Governor of Okinawa Prefecture had an interview with General Debit, Commanding General, the U.S. Army and protested against his imperfect management of the base operation.

24 Jan 1975 In response to a protest made by Deputy Governor of Okinawa Prefecture, General Debit, the U.S. Army, forwarded a letter to the Okinawa Prefectural Government stating that by 15 March deteriorated vessels containing chemicals would be replaced by new ones and they would be stored in good storge areas; and also stated that all chemicals would be withdrawn from Okinawa as soon as possible.

19 June 1975 All chemicals were withdrawn from Field Storage Area.

ENVIRONMENTAL INVESTIGATION CONDUCCTED FOR
CHEMICL FIELD STORGE AREA AT MAKIMINAOTO SERVICE AREA

Sample collected	Soil	Fish	Seawater					Seaweed	Seawater		
Kind and Location of sample collected		Big Gray Mullet	Small Gray Mullet	B15	C9	C7	C5	Laver	B15	B5	C9
Date sample collected	17 Jan 1974	17 Jan 1974	17 Jan 1974	28 Jan 1974	28 Jan 1974	28 Jan 1974	28 Jan 1974	28 Jan 1974	3 Feb 1974	3 Feb 1974	3 Feb 1974
Dieldrin detected	ppm 11.04	ppm 0.058	ppm 0.076	ppb 0.18	ppb 0.12	ppb 0.07	ppb 0.10	ppb 83.0	ppb 0.02	ppb 0.03	ppb 0.02

* Remarks ADI Allowable dose of agricultural chemical to a human body per day (weight mg/50 kg)

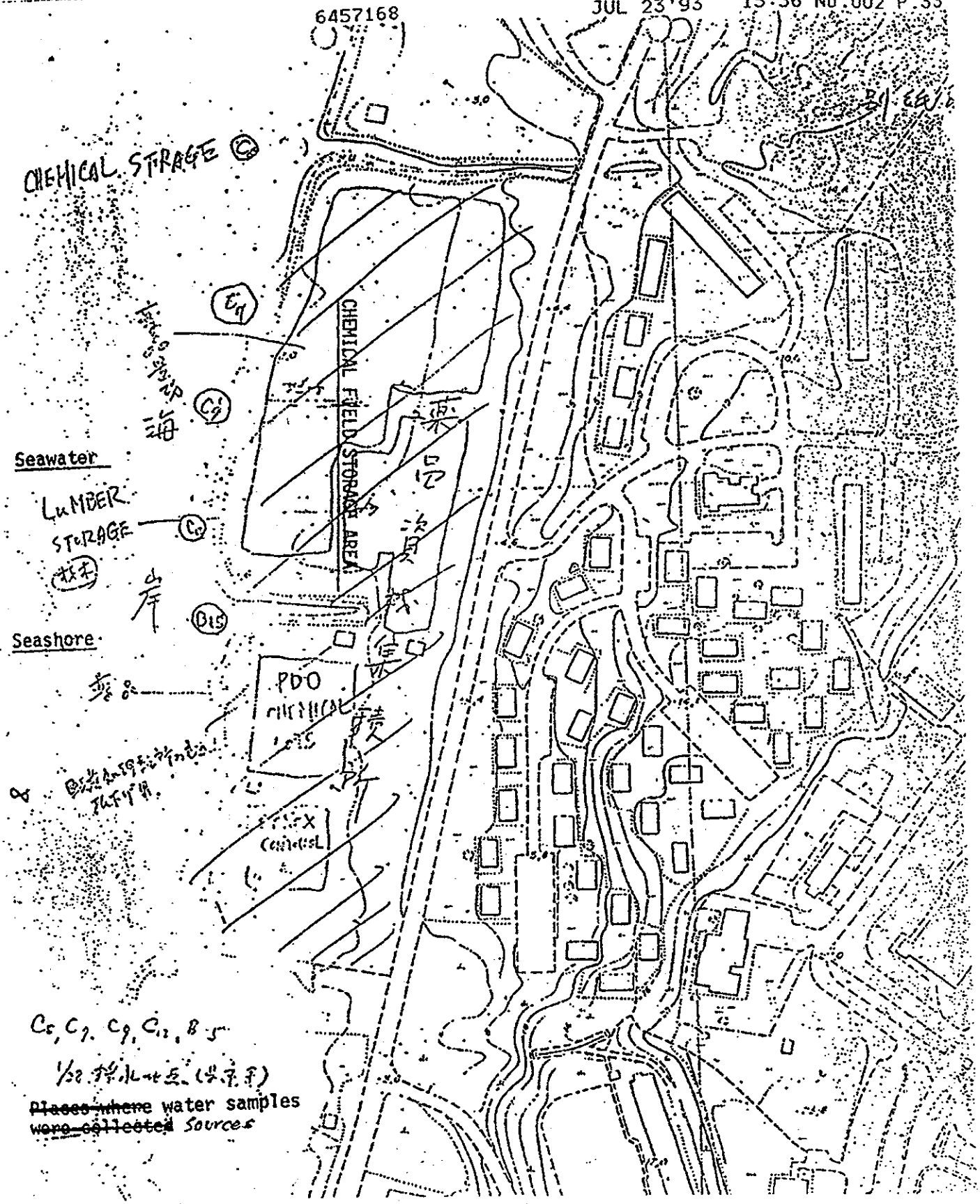
Dieldrin 0.005 mg

$$\text{ppm} = \frac{1}{1{,}000{,}000}$$

$$\text{ppb} = \frac{1}{100{,}000{,}000}$$

* On the condition that a man will eat 100 gram of fish a day, the maximum permissible dose of Dieldrin to a human body is computed as follows.

Dieldrin 0.05ppm


CHEMICAL STORAGE
CHEMICAL FIELD STORAGE AREA
Seawater
LUMBER STORAGE
Seashore
PDO
C5, C7, C9, C12, B-5
Places where water samples were collected Sources

Encl 4

1975 EHEA

Table 1

PESTICIDE RESIDUES IN ENVIRONMENTAL SAMPLES

SAMPLE NO.	MALATHION A	MALATHION B	DIAZINON A	DIAZINON B	DIELDRIN A	DIELDRIN B	LINDANE A	LINDANE B	CHLORDANE A	CHLORDANE B	DDT A	DDT B	DDD A	DDD B	DDE A	DDE B
No. 1 Fish 19 Dec	.33	.35 ppm	2	2 ppb	.02	.02 ppm	.02	.02 ppm	5.9	6.2 ppm	1.43	1.42 ppm	.61	.63 ppm	.45	N.C. ppm
No. 2 Fish 20 Dec	.53	.54 ppm	8	6 ppb	.22	.21 ppm	.05	.04 ppm	6.7	6.6 ppm	1.52	1.41 ppm	.61	.59 ppm	.35	N.C ppm
Algae	N.D		N.D		N.D		N.D		0.62 ppm		.22 ppm		N.C		N.C	
Water	55	60 ppb	N.D		.2	N.C ppb	.1	N.C ppb	2.3	N.C ppb	.21	N.C ppb	.13	N.C ppb	N.D.	
MSA 204 Soil	5.6	5.1 ppm	1.6	2.8 ppm	.461	N.C ppm	N.C		.70	N.C ppm	N.C		N.C		N.C	
MSA 206 Soil	.093	N.C ppm	N.D		N.D		N.C		.45	N.C ppm	.71	N.C ppm	N.C		N.C	
MSA 203 Soil	174	174 ppm	N.D		N.D		N.C		1.96	N.C ppm	N.C		N.C		N.C	
MSA 202 Soil	6.6	N.C ppm	N.D		N.D		N.C		6735	N.C ppm	N.C		N.C		N.C	
MSA 201 Soil	6074	7566 ppm	2.7	29 ppm	N.D		N.C		2673	N.C ppm	1425	ppm	N.C		N.C	
MSA 207 Soil	1.3	N.C ppm	N.D		.59	N.C ppm	N.C		84.8	N.C ppm	N.C		N.C		N.C	
MSA 205 Soil	N.D		N.D		N.D		N.D		.185 ppm		N.D		N.D		N.D	

A - Replicate 1 B - Replicate 2 N.D. - Not detected - N.C. - Not calculated

1 - At the high concentrations found in certain samples there was considerable spillover into other clean-up fractions. The reported concentrations are minimal

2 - High concentrations of PcB's, particularly aroclor 1260, have complicated

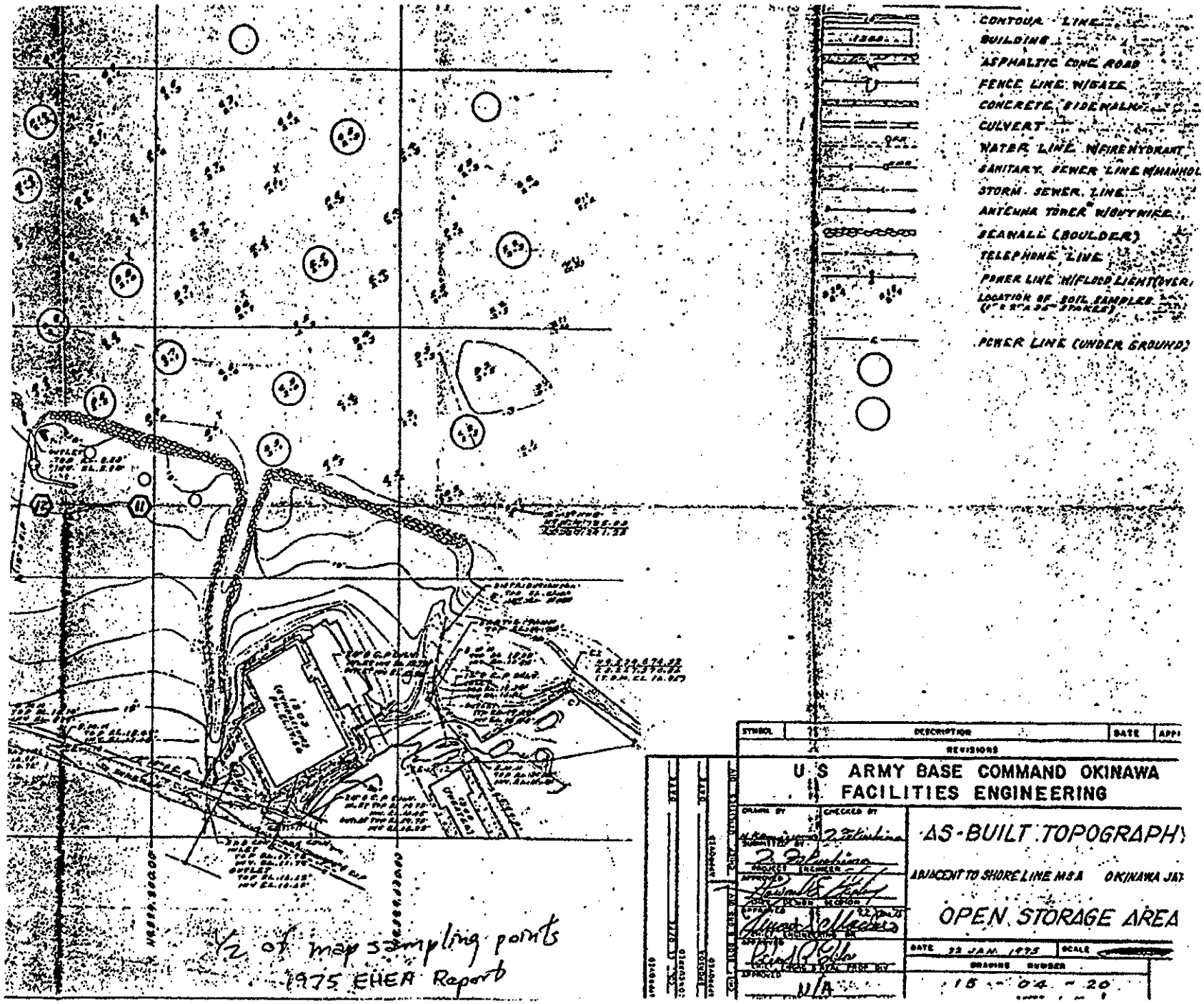
1975 EHEA

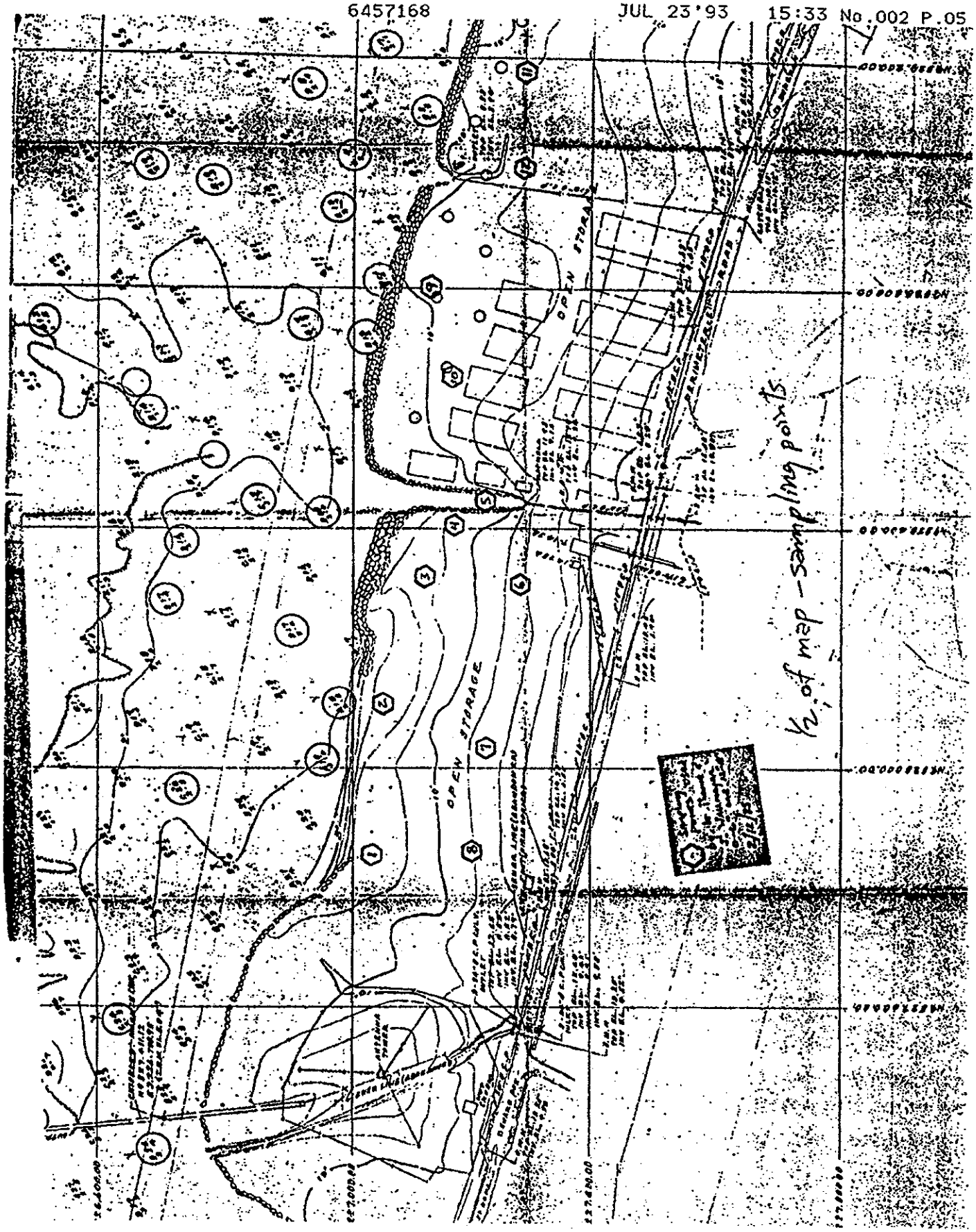
Table 2

PESTICIDE RESIDUES IN ENVIRONMENTAL SAMPLES*
TAKEN IN TIDELAND AREA, MSA LUMBER YARD, OKINAWA

SAMPLE NO./ GRID NO.	DATE COLLECTED	MALATHION	DIAZINON	DIELDRIN	LINDANE	CHLORDANE	DDT	DDD	DDE	ALDRIN
1003/A-19	24 Jan 75	.18 ppb	ND	1.8 ppb	ND	22.4 ppb	6.8 ppb	1.5 ppb	(NC) ?	ND
1005/A-18	24 Jan 75	6 ppb	ND	55.6 ppb	ND	15.9 ppb	11.23 ppb	9.7 ppb	(NC) ?	ND
1009/F-2 (Water)	24 Jan 75	ND	2.8 ppb	ND	ND	ND	ND	ND	ND	ND
1010/B-8	24 Jan 75	4 ppb	ND	2.9 ppb	ND	15.9 ppb	9.3 ppb	11.9 ppb	(NC) ?	ND
1017/B-12 (Water)	24 Jan 75	ND	ND	1.1 ppb	1.5 ppb	11.7 ppb	ND	ND	ND	ND
1018/E-14	24 Jan 75	51 ppb	ND	ND	ND	ND	ND	ND	ND	ND
1020/C-10	27 Jan 75	118 ppb	ND	1.9 ppb	ND	35.3 ppb	(NC) ?	(NC) ?	ND	ND
1027/C-12 (Water)	27 Jan 75	ND	ND	ND	ND	ND	ND	ND	ND	ND
1029/E-14 (Water)	27 Jan 75	0.2 ppb	0.8 ppb	0.33 ppb	0.2 ppb	ND	ND	ND	ND	ND
1028/D-14,D-15 (Water)	27 Jan 75	1.1 ppb	10.0 ppb	14.4 ppb	15.4 ppb	4.8 ppb	1.0 ppb	1.0 ppb	ND	ND

* Soil samples unless otherwise stated
ND - residues not detected
NC - residues detected but not calculated likely not?




OPEN STORAGE
OPEN STORAGE
Key plan - Sample points

(b) These substances have been transferred to a 15,000 gallon tanker which is presently located at Makiminato Service Area (540 Yard).

(5) Substances Identified for Land Burial.

(a) Certain code H materials located at the MSA Lumber-Yard were proposed for disposal by burial in a sanitary landfill. The proposal is currently being reviewed by the Okinawa Prefectural Government. A list of those materials is provided in Appendix V.

(b) As a result of a soil permeability characteristics study on Okinawa by the U.S. Army Environmental Hygiene Agency (reference 11), a site suitable for such a sanitary landfill operation is located at Camp Hansen (coordinates 96572993 or 96423035, U.S. Army Topographic Map, KIN, Edition 1-TPC, Series L897, Sheet 2114 I NE).

(c) Three (3) trenches approximately 50 feet long by 10 feet wide by 10 feet deep would be required to accommodate subject material. Depth of trenches provides for a minimum soil cover of three feet.

(d) With the clean-up of the MSA lumber-yard, materials identified for burial in a sanitary landfill have been relocated and segregated at the Depot Area pending approval by the Okinawa Prefectural Government.

(6) Empty Pesticide Metal Containers.

(a) Disposal of non-combustible, organic pesticide containers utilizing a smelting process was recommended as a viable approach in meeting the criteria for a thermal processing facility capable of controlled combustion at a temperature of 1000°C (1832°F) for two seconds dwell time in the combustion zone. This would assure complete conversion of the specific pesticides to inorganic gases and solid ash residues. The smelting process for steel involves temperatures in the range of 1400°C (2552°F) which is considerably higher than the minimum required for combustion of pesticides. Also, a longer contact time would be realized in the smelting process. Emission of combustion by-products such as hydrogen sulfide, phosphorus oxides, and hydrogen chloride should be minimal and would not present an environmental health hazard considering the minute amount of the pesticide residue remaining on the container surfaces.

(b) The empty pesticide containers were transferred to the Depot Area as a result of the clean-up operation. Defense Property Disposal Office, Okinawa is attempting to negotiate a contract with a smelter plant to resolve the solid waste problem created by the pesticide repackaging operations.

Encl 5

23 January 1991

HAZARDOUS WASTE SITE CAMP KINSER

I BACKGROUND

The initial identification of the existence of a problem was a fish kill of 19-20 December 1974. The fish kill took place offshore of the Army's MSA lumber yard. The source of the contamination was determined to be chemicals stored at the open yard.

1. Chemicals included insecticides, rodenticides, herbicides, inorganic and organic acids, alkalis, inorganic salts and organic solvents, and vapor degreasers.

2. The incident was studied by the U.S. Army Environmental Health Engineering Agency, Pacific. Interim report No. 90-011-75 of 9 January 1976 documents the investigation and initial cleanup.

3. The lumber yard covered the area west of the perimeter road from just south of the gym to the south gate.

4. The storage area covered approximately 500,000 sqft.

5. Cleanup actions were undertaken by the U.S. Army Garrison Okinawa, with technical guidance from U.S. Army Environmental Health Engineering Agency Pacific (EHEAP).

6. Chemicals primarily came from retrograde shipments from Viet-Nam and those declared excess as a result of phase down activities with Depot operations.

7. CINCUSARPAC directed reporting of all Okinawa excess chemicals to U.S. Army General Material Parts Center (AMC) in Dec. 1972.

8. U.S. Army Base Command Okinawa (USARBCO) was directed to package the chemicals for shipment to disposal sites in CONUS. Bids for the work of repackaging exceeded the funds available and inhouse labor undertook the action with limited success.

9. Sale of excess hazardous materials locally through Property Disposal had limited success. Many containers were in such poor condition that bidder refused to pick them up.

10. Through 1974 no deposition instructions were given USARBCO and the containers continued to deteriorate.

11. After the fish kill of 19-20 December 1974, soil and water samples were taken and indicated contamination had occurred involving the following pesticides in decreasing volume of release: malathion, chlordane, diazinon, DDT, and dieldrin.

3. Analysis of samples taken in December 1974 indicated " High concentrations of PCB's, particularly aroclor 1260, have complicated the analysis of most samples". Their was no indication that tests were run for PCB's. (This needs to be examined)

II CLEANUP OPERATIONS

1. Local disposal included the following:

a. Cyanide Compounds were neutralized. The solution was flushed into the sanitary sewer system. The sludge was disposed of by burial at the "lime pit" located at the vacant lot across from the MSA theater. The old MSA theater, building 1300, was located just north of the Gym building 1303.

b. Ferric Chloride was disposed of by land burial. 27,800 pounds of ferric chloride were buried across from the MSA theater in a 30 feet long x 10 feet wide x 5 feet deep trench.

c. Inorganic Acids and Alkalis were neutralized and flushed over the lumber-yard grounds.

d. Organic Solvents and POL related Substances were transferred to a 15,000 gallon tanker located in the MSA 540 yard. (Need to determine ultimate disposal)

2. Repackaging Operations of pesticides were conducted. Chemicals were drained from existing drums and placed in new containers. Land burial was utilized for some items. These are listed in appendix V of the report. The site of the landfill is at "Camp Hansen coordinates 96572993 or 96423035 U.S. Army Topographic Map, Kin". (Coordinates match the existing Kin Dump site)

3. Empty pesticide containers were to be disposed of by smelting. Containers were transferred to Defense Property Disposal Office, Okinawa to contract for the service.

III FOLLOW-UP

1. Sampling by the Army continued through 1978 with test results showing a decreasing trend. The 1978 Army Pacific Environmental Health Engineering Agency, Sagami letter summarized that "necessity for continued sampling and analyses of the shore line area, with respect to pesticide levels in the soil and water, appears to be non-productive in view of these already documented facts."

2. In 1984 the Naval Hospital, Okinawa was asked to determine the acceptability of the offshore area at Kinser for recreational swimming. The Hospital reviewed the Army report and received additional information that no final report was conducted and that the Army's records and actions ended in 1978.

3. Soil samples were taken by MCB Butler environmental engineer in 1985 and tested for dioxin (agent orange component). The test results were negative.

4. In October 1986 another fish kill took place offshore of Camp Kinser. It resulted from excavations associated with Urasoe city port facility construction. Drainage and road work took place in the area of the former Army lumber yard. Analysis of soil, water and fish contained elevated levels of pesticides chlordane and dieldrin, PCB contaminated oil and heavy metals. These are similar contaminates as found during the 1974 incident.

5. The use of the Kinser beach area was again investigated in November 1989. A request was made to Naval Facilities Engineering Command, Pacific Division to evaluated the past documentation and to make a recommendation as to the suitability of the area for recreational use. Their response indicated a detailed study is needed to make that determination. The estimated cost of that study is $500,000.

IV PRESENT CONDITIONS

1. The present issue is not the suitability of the area for swimming, but of the long term environmental concerns. Is a cleanup of the area necessary? What is the US Government's long term liability in the area?

2. A new cost estimate on a study to answer the environmental questions asked above is necessary.

DRAFTED BY

This summary was made by CDR Dale Peck the PWO, MCB Butler upon review of the existing Environmental Engineering files.

Encl 6

DEPARTMENT OF THE ARMY 2LT Richards/blm/228-4113
U.S. ARMY PACIFIC ENVIRONMENTAL HEALTH ENGINEERING AGENCY
APO SAN FRANCISCO 96343

REPLY TO
ATTENTION OF:

AHCH-EL 15 June 1978

SUBJECT: Results of Water and Soil Sampling of MSA Shoreline Outfall Areas

Commander
U.S. Army Garrison, Okinawa
ATTN: GAROG
APO 96331

1. Reference is made to Message 070425Z, USAGO, November 1977, subject: Water and Soil Sampling of MSA Shoreline Outfall Areas.

2. The results of pesticides and heavy metals analyses of four soil and four water samples are provided at Inclosures 1 and 2. The limits of detectability for the compounds analyzed for are provided at Inclosure 3. The delay in furnishing the results is attributed to the complexity of the analyses and the requirement for these types of analyses to be completed by the U.S. Army Environmental Hygiene Agency located in CONUS.

3. The point of contact at this Agency for further information is LT Richards, AUTOVON 228-4836/4113.

3 Incl
as

RONALD M. BISHOP
MAJ, MS
Commanding

HSE-RP-MO

RESULTS OF PESTICIDE ANALYSIS ON SOIL AND WATER SAMPLES

SAMPLE NO.	SUBSTRATE	PESTICIDES DETECTED AND QUANTITIES FOUND (ppm)
441 8/9	Water	ND*
442 10	Water	ND
443 11	Water	ND
444 4Y	Water	ND
437 10	Soil	Chlordane - 0.22 p,p' - DDD - 0.06 p,p' - DDE - 0.025 o,p' - DDT - 0.025 p,p' - DDT - 0.081
438 11	Soil	Dieldrin - 0.025 Aroclor 1254 - 5.39
439 8/9	Soil	Chlordane - 0.51 p,p' - DDD - 0.38 O,p' - DDD - 0.10 p,p' - DDE - 0.12 o,p' - DDT - 0.095 p,p' - DDT - 0.27 Dieldrin - 0.077
440 Lawn Yard	Soil	Chlordane - 1.06 Dieldrin - 0.078

*ND - Not Detected.

HSE-RP-MO

RESULTS OF HEAVY METAL ANALYSIS ON SOIL AND WATER SAMPLES

SAMPLE NO.	SUBSTRATE	HEAVY METALS DETECTED AND QUANTITIES FOUND (
437 10	Soil	Cr - 17 ? Total ? in Hexane
		↑ Pb - 140 + 69.4 in 77 OPG
438 11	Soil	↑ Cr - 37 + 15.1 in 77 "
		↑ Pb - 218 + 32.7 in 77 "
439 8/9	Soil	Cd - 1.5 +
		Toxic Cr - 36 +
		Pb - 218 +
440 Lumberyard	Soil	Toxic Hg - 0.2 ✓
		Cr - 11
		↑ Pb - 83 18.1 in 1977 01
Station No. 10	Water	Cr - 0.041 ND-77
		Cd - 0.035 ND-77
		Pb - 0.13 ND-77
		Hg - 0.0008 ND-77
Station LY	Water	Cr - 0.053 ND "
		Cd - 0.033 ND "
		Pb - 0.17 ND "
		Hg - 0.0004 ND "
Station No. 11	Water	Cr - 0.47 ND "
		Cd - 0.031 ND "
		Pb - 0.15 ND "
		Hg - 0.0004 ND "

Ltr 2

HSE-RP-MO

SAMPLE NO.	SUBSTRATE	HEAVY METALS DETECTED AND QUANTITIES FOUND (ppm)
Station 8/9	Water	Cr - 0.043 ND-77 Cd - 0.025 ND Pb - 0.15 ND Hg - <0.0004 ND

ENVIRONMENTAL STANDARDS (ppm)

	SOIL		WATER	
COMPOUND	USG	GOJ	USG	GOJ
o,p'-DDT	0.020	---	0.00020	---
p,p'-DDT	0.030	---	0.00030	---
o,p'-DDD	0.020	---	0.00020	---
p,p'-DDD	0.016	---	0.00016	---
p,p'-DDE	0.016	---	0.00016	---
Chlorodane	0.060	---	0.00060	---
Dieldrin	0.012	---	0.00012	---
Endrin	0.021	---	0.00021	---
Malathion	0.010	---	0.00080	---
Aldrin	0.008	---	0.00008	---
Diazinon	1	---	1	---
Lindane	---	---	0.00020	---
Mercury	0.1	0.0005	0.0004	0.0005
Cadmium	0.5	0.01	0.01	0.01
Chromium	3.0	0.05	0.001	0.05
Lead	1.0	0.1	0.01	0.01
Arsenic	---	0.05	0.5	0.01
PCB	25	ND	45	ND
Phenol	---	---	5.0	5
pH	---	---	5.0-8.6	7.8-8.3
DO	---	---	5	7.5
MBAS	---	---	---	---

HSE-RP-MO

PESTICIDES AND HEAVY METALS ANALYZED FOR AND THEIR LIMITS OF DETECTABILITY (ppm)*

COMPOUND	LIMITS OF DETECTABILITY (ppm) SOIL	WATER
o,p' - DDT	0.020	0.00020
p,p' - DDT	0.030	0.00030
o,p' - DDD	0.020	0.00020
p,p' - DDD	0.016	0.00016
p,p' - DDE	0.016	0.00016
Chlordane	0.060	0.00060
Dieldrin	0.012	0.00012
Endrin	0.021	0.00021
Malathion	0.010	0.00080
Aldrin	0.008	0.00008
Mercury	0.1	0.0004
Cadmium	0.5	0.01
Chromium	3.0	0.001
Lead	1.0	0.01

*Levels below which the compound would not be detected.

90-451-78

AHCH-EE (15 Jun 78) 2nd Ind
SUBJECT: Results of Water and Soil Sampling of MSA Shoreline Outfall Areas

U.S. Army Pacific Environmental Health Engineering Agency, Sagami, APO San Francisco 96343 1 September 1978

TO: Commander, U.S. Army Garrison, Okinawa, ATTN: GAROG-P, APO 96331

1. As per request, the following interpretation for results of water and soil sampling of MSA shoreline outfall areas has been prepared.

a. Heavy Metals in Water Samples. Two concentrations of heavy metals are important to the aquatic environment. They are the lethal concentrations, which show acute toxicity effects, and the sub-lethal concentrations, which show chronic effects such as causing biochemical and physiological deficiencies that could impair life processes. The levels of heavy metals found in the MSA shoreline outfall area are all sub-lethal, in that no acute toxicity effects are presently manifested (fish are not dying); however, most of the levels are well above the natural concentrations normally found in seawater and exceed the levels identified as having potentially hazardous effects on the marine environment. (In concert with the Panel on Marine Aquatic Life and Wildlife, as stated in Water Quality Criteria 1972.[1])

(1) Cadmium. The natural concentration normally found in seawater is 0.02 micrograms per liter (parts per billion) [µg/l (ppb)]; levels exceeding 0.01 milligrams per liter (parts per million) [mg/l (ppm)] constitute a hazard in the marine environment, as well as to human populations. The hazardous level was established as 1/100th of the "96-hour LC50"[2] data for organisms most sensitive to cadmium.

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[1] Water Quality Criteria 1972, A Report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, National Academy of Engineering, Washington, D.C., 1972.

[2] The concentration of a test material that causes death to 50 percent of the population within 96 hours.

AHCH-ER (15 Jun 78) 2nd Ind 1 September 1978
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(a) Cadmium levels for water from Station 8/9 were found to be 0.025 mg/l, or 2.5 times greater than the level determined as constituting a hazard to the marine environment.

(b) Cadmium levels for water from Station 10 were found to be 0.035 mg/l, or 3.5 times greater than the hazardous level.

(c) Cadmium levels for water from Station 11 were found to be 0.031 mg/l, or 3.1 times greater than the hazardous level.

(d) Cadmium levels for water from Station LY were found to be 0.033 mg/l, or 3.3 times greater than the hazardous level.

(2) Chromium (Total). The natural concentration normally found in seawater is 0.04 µg/l (ppb); levels exceeding 0.1 mg/l (ppm) constitute a hazard to the marine environment. The hazardous level was established as 1/100th of the 96-hour LC50 data for organisms most sensitive to chromium.

(a) Chromium (total) levels for water from Station 8/9 were found to be 0.043 mg/l and should cause little or no deleterious chronic effect upon the marine environment of this area.

(b) Chromium (total) levels for water from Station 10 were found to be 0.041 mg/l and should cause little or no deleterious chronic effect upon the marine environment of this area.

(c) Chromium (total) levels for water from Station 11 were 0.47 mg/l or 4.7 times greater than the specified hazardous level.

(d) Chromium (total) levels for water from Station LY were 0.053 mg/l and should cause little or no deleterious chronic effect upon the marine environment of this area.

(3) Lead. The natural concentration normally found in seawater is 0.02 µg/l (ppb); levels exceeding 0.05 mg/l (ppm) constitute a hazard to the marine environment. The hazardous level was established as 1/50th of the 96-hour LC50 data for organisms most sensitive to lead.

(a) Lead levels for water from Station 8/9 were found to be 0.15 mg/l, or 3 times greater than the level determined as constituting a hazard to the marine environment.

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(b) Lead levels for water from Station 10 were found to be 0.13 mg/l, or 2.6 times greater than the hazardous level established to prevent chronic effects from occurring in the marine environment.

(c) Lead levels for water from Station 11 were found to be 0.15 mg/l, or 3 times greater than the hazardous level.

(d) Lead levels for water from Station LY were found to be 0.17 mg/l, or 3.4 times greater than the hazardous level.

(4) Mercury. The natural concentration normally found in seawater is 0.1 µg/l (ppb); all levels of mercury exceeding the natural level are considered to be potentially hazardous in the marine environment because of its extreme toxicity, as well as the documented hazard to marine aquatic life and to humans through marine foods. Therefore, it is desirable to eliminate all sources of mercury to the marine environment beyond those which occur naturally through continental weathering.

(a) Mercury levels for water from Station No. 8/9 were found to be less than 4.0 µg/l, or the minimum limit of detectibility.

(b) Mercury levels for water from Station 10 were 8.0 µg/l, or 80 times the level determined to be potentially hazardous to the marine environment.

(c) Mercury levels for water from Station 11 were 4.0 µg/l, or 40 times the level determined to be potentially hazardous to the marine environment.

(d) Mercury levels for water from Station LY were 4.0 µg/l, or 40 times the level determined to be potentially hazardous to the marine environment.

b. Heavy Metals in Soil Samples. A comparison of the results of the soil sampling analyses with the results of water sampling analyses from the same areas quickly shows that there is very little correlation between the quantities found in the soil and the quantities which leach into the water. The level of heavy metals released into the water is a local phenomenon which depends on many factors, such as the tidal action and the resultant erosion of the soil at that specific shoreline area. The soil analyses serve primarily to confirm that the soil in these areas does contain quantities of heavy metals which are released to the

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SUBJECT: Results of Water and Soil Sampling of MSA Shoreline Outfall Areas

aquatic environment through erosion of the shoreline. An interpretation as to the hazard caused by these heavy metals in the soil cannot be related to the levels found. A reduction of the levels of heavy metals in the soil from the previous year's sampling indicates that NO subsequent contamination of the MSA shoreline area has occurred and that natural decomposition of the contamination by weathering has taken place.

c. Pesticides in Soil and Water Samples. The type of analysis performed indicates only whether or not pesticides are present in the water and soil and does not lend itself to an interpretation of the potential hazard from these pesticides. The fact that there were no active ingredients detected in the water would lessen the likelihood of toxic effects to fish; however, the possibility of bottom feeders accumulating quantities of pesticides still exists. The hazard to aquatic life and wildlife can only be assessed from an analysis of the homogenated tissues of fish species which are consumed by fish-eating birds and mammals. This Agency does not specify the types or quantities of samples to be taken or analyzed for, but merely conducts parallel sampling with the Government of Japan (GOJ) representatives who do specify the types and quantities of samples to be taken. Therefore, any questions as to the relevance or irrelevance of a particular sampling procedure must be directed to GOJ. This Agency's position is that the pesticide samples and analyses which are performed in conjunction with GOJ provide very limited scientific and ecological data concerning the impact of the Army's operations on the MSA shoreline environment. The fact that the chemical storage areas which once existed at MSA contributed to the contamination of the adjacent shoreline area has been well-documented. The fact that Army operations are no longer contributing contamination to this area has also been documented. The necessity for continued sampling and analysis of the shoreline area with respect to pesticide levels in the soil and water, appears to be non-productive in view of these already documented facts. A continued decrease in the levels found in the soil for these areas can be expected unless increased use or storage of pesticides in this area is anticipated, at which time an environmental assessment of the operations should be made.

2. Request notification of any subsequent joint sampling effort well in advance of the proposed sampling date to arrange a meeting with GOJ environmental protection agency representatives to discuss the relevancy and purpose of continued sampling of the MSA shoreline area. The heavy metal contamination of the shoreline area may or may not be the result of U.S. Army operations and cannot be properly assessed without the use of control sampling stations located along the shoreline which are not

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adjacent to the MSA operation area. Continued sampling should be designed with the specific purpose of identifying the effects, if any, on the aquatic communities in these areas as compared with the aquatic communities in adjacent shoreline areas of similar ecological structure. Continued sampling to provide scientific data for this type of study would be considered worthwhile, whereas continued sampling of the type conducted in the past would provide little useful data concerning the condition of the MSA shoreline ecosystem and the affects of U.S. Army operations on this ecosystem.

3. For further information, the point of contact at this Agency is CPT William T. Broadwater, MS, Chief, Environmental Engineering Division, AUTOVON 228-4834/4114.

RONALD M. BISHOP
MAJ, MS
Commanding

CF:
CDR, USARJ (AJMD)

Encl 7

DEPARTMENT OF THE NAVY
U.S. NAVAL HOSPITAL
OKINAWA, JAPAN
FPO SEATTLE 98776

6280
570
21 Sep 84

From: Commanding Officer, U.S. Naval Hospital, Okinawa, Japan
To: Commanding General, Marine Corps Base, Camp Smedley D. Butler, FPO Seattle, WA 98773

Subj: U.S. Army EHEAP Special Study No. 90-011-075, Interim Report, Chemical Storage Area Clean-up, Makiminato Service Area, Okinawa, 19 Dec 74 - 31 Jul 75

Ref: (a) NAVFACINST 11330.14A
(b) Farm Chemicals Handbook 1982, Meister Publishing Company 1982.(NOTAL)
(c) Registry of Toxic Effects of Chemical Substances, 1979 U.S. Department of Health and Human Services, PHS, CDC, NIOSH (NOTAL)

1. The subject report dealing with pesticide contamination of tideland and lower beach area at Camp Kinser is forwarded. Per your earlier request in August, we find, based on the contents of the subject study, that the establishment of a swimming beach in the vicinity of the offshore tideland area delineated in the report does not present a significant human health hazard as far as external or respiratory exposure to persistent pesticides is concerned. Other environmental pollution threats that may exist have not been fully evaluated. The threat to human health in the offshore area is considered negligible based on the results contained in Table 2 of the study. The primary hazard offshore would be oral ingestion of any pesticide residues while swimming. Per reference (a), the maximum acceptable limits for the pesticides lindane, endrin, methoxychlor and toxaphene in potable drinking water are 0.0002, 0.004, 0.1 and 0.005 mg/l (PPM) respectively. These pesticides are all in the same chlorinated hydrocarbon group as dieldrin, chlordane, DDT, DDD, and DDE. While many of these are long lasting in the environment and may be capable of creating problems of environmental contamination, the documented levels of all pesticides tested for in Table 2 are in the parts per billion (PPB) range. While direct correlations between pesticide toxicity within a group are risky, we feel that the ingestion of any of these pesticides in the tideland area in an amount sufficient to cause injury or disease is extremely remote. Per references (b) and (c), the given oral toxicities for these pesticides sufficient to cause death in 50% (LD50) of tested laboratory animals (rat) are:

PESTICIDE	ACUTE ORAL LD50 (mg/kg)
Dieldrin	46
Lindane	88-125
[illegible]	367-515

Subj: U.S. Army EHEAP Special Study No. 90-011-075, Interim Report, Chemical Storage Area Clean-up, Makiminato Service Area, Okinawa, 19 Dec 74 - 31 Jul 75

Dieldrin is classified as highly toxic; DDD is only slightly toxic and the rest are moderately toxic. The potential exposures in the offshore tideland area will not approach these levels.

2. Malathion and diazinon are organophosphate group insecticides. Most insecticides in this group deteriorate rapidly in the environment and thus do not pose the potential problem of environmental contamination that the chlorinated hydrocarbon group does. Malathion is classified slightly toxic via the oral route (1000 mg/kg) and dermal route (4,100 mg/kg) and diazinon is classified moderately toxic orally (300-400 mg/kg) and slightly toxic dermally (3,600 mg/kg). They do not present a threat in the offshore tideland area.

3. Of greater concern is the analytical results presented in Table 1 for soil samples collected in the lower beach area. Chlordane levels ranged from 67.5 - 2,673 PPM and DDT was found at 1425 PPM. Malathion and diazinon were also noted at high levels, and while we would normally expect these insecticides to have completely deteriorated in the environment due to the combined action of light, temperature, moisture and soil, we cannot be 100% sure that they present no hazard. Based on the results in Table 1 of this interim report, we can probably expect some residual contamination from at least chlordane and DDT in soil at the locations indicated for storage of DDT and chlordane in figure 7. We do not know how significant these residual levels may be or how much of a health threat they present. The establishment of a beach or the planned construction of a new dental facility in this area present potential recreational and occupational exposures that are most difficult to quantify. Construction workers who recently completed the new medical dispensary may already have been exposed to contaminated soil and dust, although we have received no reports of occupational illness or injury that appear related to this. Recommended occupational exposure limits exist for these pesticides as concentrations in a given volume of air. The exposure can be through contact with skin or mucous membranes, oral ingestion or via the respiratory tract. The extent and significance of such exposures to beach users or construction workers where the soil is being excavated cannot be directly correlated with recommended exposure limits and the pesticide concentration levels found in the soil samples.

4. The report does not indicate the depth into the soil that the pesticides penetrated nor is there an indication that any contaminated soil was containerized for disposal. Also of prime significance is the notation on the bottom of Table 1 that high concentrations of polychlorinated biphenyls (PCB's) interfered with the analysis of most samples. PCB's are also highly toxic, a suspected carcinogen, extremely persistent and virtually indestructible in the natural environment. It would appear that devices containing PCB's were stored in these areas also and leaked liquid containing PCB's into the soil.

Subj: U.S. Army EHEAP Special Study No. 90-011-075, Interim Report, Chemical Storage Area Clean-up, Makiminato Service Area, Okinawa, 19 Dec 74 - 31 Jul 75

5. In addition to the above, the report mentions the presence of herbicides and Vietnam retrograde cargo. They did not indicate anywhere in the report that they actually found or detected herbicides. Of paramount concern would be agent orange, the defoliant containing a by product of the manufacturing process, dioxin.

6. In conclusion, the interim report leaves many unanswered questions. However, based on what we do know about this pollution incident, we recommend the following:

a. That establishment of a swim and beach area at this location be delayed until the extent of any health hazards have been properly quantified and eliminated.

b. That additional information in the form of a final report of this pollution and contamination problem be requested from the U.S. Army Pacific Environmental Health Engineering Agency, Sagami, Japan.

c. That, based on any additional information provided, necessary follow-up surveys be conducted at Kinser to include soil sampling for pesticides and PCB's in all affected areas, including areas around the new medical clinic.

7. We will request the additional information and conduct any necessary follow-up surveys, coordinating with the Environmental Engineer, Public Works Department. We may request professional technical advice and assistance from Navy Environmental Health Center and Navy Environmental Support Office personnel if deemed appropriate prior to conducting surveys. If there are any questions at this time, please contact LT R. Thoune at 634-0105/0228.

J. R. McCORMICK
By direction

Copy to:
Group Surgeon, 3rd FSSG
Env. Eng., PWD

DEPARTMENT OF THE NAVY
U.S. NAVAL HOSPITAL
OKINAWA, JAPAN
FPO SEATTLE 98778

6280
570
25 Sep 84

From: Commanding Officer, U.S. Naval Hospital, Okinawa, Japan
To: Commander, U.S. Army Pacific Environmental Health Engineering Agency, Sagami, APO San Francisco, 96343

Subj: REQUEST FOR ADDITIONAL INFORMATION ON HAZARDOUS WASTE/TOXIC MATERIALS SPILLS ON OKINAWA

Ref: (a) U.S. Army EHEAP Special Study No. 90-011-075, Interim Report, Chemical Storage Area Clean-up, Makiminato Service Area, Okinawa, 19 Dec 74 - 31 Jul 75

1. A copy of reference (a) was previously provided to us by your command. The report has been utilized for evaluating any potential human health risks associated with the establishment of a natural bathing beach area within the Makiminato Service Area, now known as Camp Kinser. Recognizing that this report was an interim report, we have a certain number of questions regarding whether a final cleanup was performed, the result of the cleanup and any conclusions and recommendations for future uses of the affected area.

2. In this respect, we are requesting that a copy of a final report on this problem, if completed, be forwarded for our review and historical records. In addition, we are requesting copies of any other reports or records that document toxic or hazardous waste or material dumps, burial sites or spill cleanups that have occurred since U.S. Forces occupation began in 1945. A copy of a final report of the Camp Kinser chemical cleanup is needed in an urgent time frame.

3. If there are any questions on this matter, please contact LT R. Thoune, MSC, USNR, Head, Environmental Health Branch, Consolidated Preventive Medicine at AUTOVON:634-0228/0105.

J. R. McCORMICK
By direction

Copy to:
CG MCB ATTN: F.E.
Surg, 3rd FSSG
PWD, MCB
Cp Cmder, Cp Kinser

DEPARTMENT OF THE NAVY
U.S. NAVAL HOSPITAL
OKINAWA, JAPAN
FPO SEATTLE 98776

6280
640
21 Dec 84

From: Commanding Officer, U.S. Naval Hospital, Okinawa, Japan
To: Commanding General, MCB, Camp Smedley D. Butler, FPO Seattle, WA 98773 ATTN: Facilities Engineer

Subj: UPDATE ON CHEMICAL STORAGE AREA CLEANUP AT CAMP KINSER

Ref: (a) CO, USNH ltr 6280 570 dtd 25 Sep 84

Encl: (1) CDR, USA PACEHEA, Sagami ltr AJEH-E dtd 21 Nov 84 with attachments

1. A meeting was held between LT R. Thoune, Consolidated Preventive Medicine and Mr. J. Wallmeyer, Environmental Engineer, Public Work Department on 12 December 1984. Enclosure (1) is the U.S. PACEHEA answer to our reference (a) request for a final report on the Camp Kinser chemical spill area. Mr. Wallmeyer and LT Thoune reviewed this information and jointly agreed that the additional sampling, analysis and results obtained are inconclusive. From 1977 forward, the sampling of Kinser shifted from specific samples of soil in the spill area to standard environmental observation type sampling along the coast at drainage water exit points.

2. As a result, the analyses conducted from 1977 forward are not relevant to the chemical spill area itself. Only one sample each was taken in 1977 and 1978 in the vicinity of the lumber yard chemical spill area and these were collected at the edge of the tidal basin, not on the land area believed to be still affected by the spill. Sampling and analysis along the shoreline in 1977 and 1978 does show the continued presence of heavy metal levels in tidal basin samples above that normally expected from the background natural environment. However, these elevated levels were not confined to the lumber yard area alone, but were also found at three other tidal basin sampling locations at approximately 2,500, 4,600, and 7,200 feet north of the lumber yard. These other three locations have no correlation with the lumber yard area itself and cannot be used for any type of comparison. They were not acceptable control type samples. We suspect that elevated levels of heavy metals in tidal basin soil (sludge) samples are from past accidental or undocumented disposal of heavy metal contaminated liquid wastes to the storm drain system from both the military industrial activities on board the camp and from similar activities in the civilian sector along Highway 58. To our knowledge GOJ has not requested that action be taken by U.S. Forces to remove any heavy metal contaminated tidal basin sludge.

3. PACEHEA recognized the fact that pesticide sampling and analysis

Subj: UPDATE ON CHEMICAL STORAGE AREA CLEANUP AT CAMP KINSER

on the MSA shoreline environment. They felt that continued sampling and analysis of the shoreline area would be nonproductive. We agree with this position and do not advocate continued sampling of the shoreline for contamination related to this chemical spill incident. However, the additional information obtained from PACEHEA does not resolve our original questions regarding the present state of environmental contamination from the chemical spill in the lumber yard and chemical storage area. In light of this, we are recommending that additional sampling of the lumber yard and chemical storage and cleanup area be conducted. LT Thoune and Mr. Wallmeyer have defined a sampling plan and are in the process of obtaining necessary sample containers and laboratory support. Once this support is solidified, samples will be collected, forwarded to the appropriate laboratory and analyzed. When results are obtained, we will provide an interpretation of their significance and provide recommendations for corrective actions as needed.

4. If there are any questions or we can be of any further assistance at this time, please contact LT Thoune at 634-0105/1302.

H. B. LEWANDOWSKI
By direction

Copy to:
Env. Eng., PWD (w/o Encl (1))
Group Surgeon
Cp Cmder, Cp Kinser
CG, 3rd FSSG

D AT GOVERNMENT EXPENSE

AJEH-E (USNH/25 Sep 84) 1st End 1LT Odland/bri/228-4113
SUBJECT: Information on Hazardous Waste/Toxic Materials Spills on Okinawa

Commander, US Army Pacific Environmental Health Engineering, Sagami, APO San Francisco 96343-0079 21 November 1984

TO: Commanding Officer, US Naval Hospital, Okinawa, Japan, FPO Seattle 98778

1. Reference, US Naval Hospital letter, subject: Request for Additional Information on Hazardous Waste/Toxic Materials Spills on Okinawa.

2. This Agency became functional in 1968 but have no records about hazardous waste on Okinawa until 1975. PDO had stored retrograde pesticides and herbicides from Vietnam at the Mikiminato Service Area, now known as Camp Kinser. Rain water washed these chemicals into the ocean, causing fish kills that alerted officials to storage deficiencies.

3. Enclosed is information on the spills, the clean up, and repetitive soil sampling which took place until 1978. No more recent documentation of action taken is noted in our files. No final report was written on the chemical storage area clean-up, only on the follow-up soil sampling for three years afterward.

4. Point of contact on this matter is CPT Douglas A. Pelton, this Agency, AUTOVON (Japan) 228-4112/4113.

Douglas A Pelton CA, MS

WALTER J. CRITZ
CPT(P), MS
Acting Commander

5 Encl
1. Report, Special Study No. 90-011-75, Chemical Storage Area Clean-up, Makiminato Service Area, Okinawa, 19 December 1974 - 31 July 1975 (Not included)
2. Fact Sheet, Summary of Support by EHEAP, related to the Chmical Spill at Building 615, Makiminato Service Area, 11 September 11975.
3. MFR, Shipment of MSA Sludge & Soil Sample for Pesticide Analysis, 23 Feb 1976; with results of analysis attached.
4. MFR, Joint Sampling of Water and Soil Along MSA Shoreline, November 1977; with sampling site map and results attached.
5. Ltr, Results of Water & Soil Sampling of MSA Shoreline Outfall Areas, 15 June 1978; with sampling results and interpertation of results (1 September 1978) attached.

O Daniel

Encl 8

1985 data

DEPARTMENT OF THE NAVY
NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY
PORT HUENEME, CALIFORNIA 93043

IN REPLY REFER TO:
11100/1
Ser 112N/829
3 JUN 1985

From: Commanding Officer, Naval Energy and Environmental Support Activity
To: Commanding General, Marine Corps Base, Camp S. D. Butler, Okinawa, Japan

Subj: REPORT OF ENVIRONMENTAL SAMPLE ANALYSES

Ref: (a) PHONCON MCB (Camp S. D. Butler) J. Wallmeyer/NEESA (Code 112N) W. Eakes of 29 Apr 85

Encl: (1) California Analytical Laboratories, Inc., ltr report of analytical results of 26 Apr 85

1. The analytical results of the 24 soil samples were reported to Mr. Wallmeyer during reference (a). Enclosure (1) is forwarded as a record of these analyses. All the dioxin samples were reported to be "negative."

2. If we can be of further assistance on this matter, please contact Wallace Eakes, Code 112N, Naval Energy and Environmental Support Activity, Port Hueneme, CA 93043-5014, AUTOVON 360-3351.

Robert I. Cantor

ROBERT I. CANTOR
By direction

California Analytical Laboratories, Inc.
2544 Industrial Boulevard • West Sacramento, CA 95691 • (916) 372-1393

April 26, 1985
Lab No. 20624
Received: 4/4/85
Ref# 5102248-0

Commanding Officer
Navy Energy and Environmental Support Activity
ATTN: Wallace Eakes Code 112N
Port Hueneme, CA 93043-5014

Dear Mr. Eakes:

Enclosed are the results for the following 24 samples we received 4/4/85 for 2,3,7,8-TCDD analysis:

CAL I.D.	Sample I.D.
20624-1	K-1 0'6"
-2	K-1 12-18"
-3	K-2 0-6"
-4	K-2 10"
-5	K-3 0-6"
-6	K-3 12-18"
-7	K-4 0-6"
-8	K-4 12-18"
-9	K-5 0-6"
-10	K-5 12-18"
-11	K-6 0-6"
-12	K-6 12-18"
-13	K-7 0-6"
-14	K-7 12-18"
-15	K-8 0-6"
-16	K-8 12-18"
-17	K-9 0-6"
-18	K-9 12-18"
-19	K-10 0-6"
-20	K-10 12-18"
-21	K-11 0-6"
-22	K-11 12-18"
-23	K-12 0-6"
-24	K-12 12-18"

The samples were analyzed by current EPA protocols, and the results are listed on the enclosed data summary sheets. All the samples were negative, and no problems were encountered.

If you have any questions, please call.

Sincerely,

Paul A. Jaks for

Michael J. Millie, PhD
Director of GC/MS Services

MJM:jb
cc: Receiving Officer, NCBC

ENCLOSURE (1)

QUALITY CONTROL SUMMARY

Case No. 20624

Mean Accuracy, Surrogate Measurements: 102% # of Data Points 25

Accuracy, Fortified/Spike Field Blank: NR Sample # _____

Rel. Diff. (%), Duplicate Analysis: NR Sample # _____

NR = Not Required

Prepared by: JJ

Approved by: [illegible]

Date 4-25-95

TCDD DATA REPORT
California Analytical Laboratories
2544 Industrial Blvd.
W. Sacramento, CA 95691

: California Analytical Laboratories
: No. 20624
:h/Shipment No.

Report Date: 4-22-85
Column: SP-2330 60M X 0.32MM

Cal Labs ID	Sample Number	C U	Aliquot Wet Wt. (grams)	PPB TCDD Meas	PPB TCDD Det. Lmt	Inst ID	Date	Time	320/322	332/334	PPB Surrg Meas	Surrg % Acc'c	320	322	257	328*	332	334	Comm
24-1MB	METHOD BLANK	Y	10.00	ND	0.0074	8	04/22/85	12:56:00	1.00	0.81	0.99	99	-	-	-	671201	834957	1032320	
24-1	K-1 0-6"	Y	10.00	ND	0.012	8	04/22/85	13:18:00	1.00	0.81	1.00	100	-	-	-	444349	546943	677323	
24-2	K-1 12-18"	Y	10.07	ND	0.034	8	04/22/85	13:53:00	1.00	0.79	0.99	100	-	-	-	356313	435042	547656	
24-3	K-2 0-6"	Y	10.25	ND	0.020	8	04/22/85	14:11:00	1.00	0.81	0.96	98	-	-	-	207628	258735	320404	
24-4	K-2 10"	Y	10.08	ND	0.022	8	04/22/85	14:36:00	1.00	0.81	0.96	97	-	-	-	190972	243126	298656	
24-5	K-3 0-6"	Y	10.03	ND	0.013	8	04/22/85	14:53:00	1.00	0.80	0.97	97	-	-	-	402514	503106	632381	
24-6	K-3 12-18"	Y	10.09	ND	0.010	8	04/22/85	15:15:00	1.00	0.80	0.99	100	-	-	-	534500	651448	812705	
24-7	K-4 0-6"	Y	10.25	ND	0.026	8	04/22/85	15:39:00	1.00	0.77	0.96	98	-	-	-	418699	508209	661881	
24-8	K-4 12-18"	Y	10.02	ND	0.013	8	04/22/85	16:15:00	1.00	0.81	1.00	100	-	-	-	508537	620385	770302	
24-9	K-5 0-6"	Y	10.00	ND	0.010	8	04/22/85	16:30:00	1.00	0.79	1.03	103	-	-	-	436437	516931	650919	
24-10	K-5 12-18"	Y	10.06	ND	0.012	8	04/22/85	16:46:00	1.00	0.80	1.02	103	-	-	-	360089	428561	536052	
24-11	K-6 0-6" 1	Y	10.16	ND	0.0058	8	04/22/85	17:04:00	1.00	0.81	0.98	99	-	-	-	705921	871973	1082890	
24-12	K-6 12-18"	Y	10.18	ND	0.011	8	04/22/85	17:20:00	1.00	0.79	0.97	99	-	-	-	466647	570367	725952	
24-13	K-7 0-6"	Y	10.00	ND	0.023	8	04/22/85	17:36:00	1.00	0.81	1.06	106	-	-	-	278785	323790	401783	
24-14	K-7 12-18"	Y	10.08	ND	0.011	8	04/22/85	17:54:00	1.00	0.80	1.04	105	-	-	-	464906	542317	679673	
24-15	K-8 0-6"	Y	10.05	ND	0.018	8	04/22/85	18:08:00	1.00	0.78	1.02	103	-	-	-	284193	332787	425466	
24-16	K-8 12-18"	Y	10.00	ND	0.010	8	04/22/85	18:24:00	1.00	0.79	1.03	103	-	-	-	536293	634343	798577	
24-17	K-9 0-6"	Y	10.16	ND	0.013	8	04/22/85	18:57:00	1.00	0.79	1.11	113	-	-	-	392011	421156	535653	
24-18	K-9 12-18"	Y	10.18	ND	0.014	8	04/22/85	19:30:00	1.00	0.81	1.03	105	-	-	-	305973	357636	443221	
24-19	K-10 0-6"	Y	10.20	ND	0.017	8	04/22/85	19:46:00	1.00	0.81	1.01	103	-	-	-	282605	336348	416386	
24-20	K-10 12-18"	Y	10.01	ND	0.018	8	04/22/85	20:02:00	1.00	0.80	1.04	104	-	-	-	289313	340882	424987	
24-21	K-11 0-6"	Y	10.08	ND	0.047	8	04/22/85	20:18:00	1.00	0.79	1.03	103	-	-	-	122783	144146	181815	
24-22	K-11 12-18"	Y	10.08	ND	0.0065	8	04/22/85	20:35:00	1.00	0.80	1.00	101	-	-	-	673116	811535	1015610	
24-23	K-12 0-6"	Y	10.06	ND	0.030	8	04/22/85	20:51:00	1.00	0.80	1.10	111	-	-	-	178130	196719	245368	
24-24	K-12 12-18"	Y	10.28	ND	0.0083	8	04/22/85	21:07:00	1.00	0.79	1.01	104	-	-	-	506498	589817	747282	

MB = Method Blank
P = Partial Scan/Confirmatory Analysis
MS = Native TCDD Spike
D = Duplicate/Fortified Field Blank
RI = Re-injection
FB = Field Blank
ND = Not Detected
DL = Detection Limit
RX = Re-extraction

*Corrected for contribution by native TCDD; 0.9% of m/z 322 subtracted

California Analytical Laboratories
Daily Calibration Summary

Native Conc ug/ml	ID	Injection Date	Injection Time	Standard ID	A320	A322	A323	A328	A332	A334	RF Native	RF Surr.	TCDD Isomer Resolut'ns
PC	8	04/22/85	10:57:00	DN8850422A	434146	549576	73062	500704	1133610	1422130	.77	.97	10.40
0.20	8	04/22/85	12:02:00	ST8850422B	257334	329384		847564	1033940	1286010	.68	.91	
0.20	8	04/22/85	15:55:00	ST8850422C	274103	353174		917553	1112180	1388910	.63	.91	
0.20	8	04/22/85	21:23:00	ST8850422E	253003	322369		822400	972164	1211970	.66	.94	
PC	8	04/22/85	21:40:00	DN8850422B	473349	609568	81780	559202	1204640	1538220	.79	1.01	8.80

PC = Performance check solution

Encl 9

1986 data received from Okinawa Prefecture

INCIDENTS INVOLVING FISH KILLED AT THE RECLAIMED LAND AREA OFF URASOE-SHI (MAKIMINATO SERVICE AREA)

Page 1 A study on the cause resulting in fish killed

Page 2 An analysis of the incidents (The first investigation)

Page 3 An analysis of the incidents (The second investigation)

Page 4 Map of the area where an investigation was conducted

Page 5 Incidents involving waste oil leaking at the reclaimed land off Lumber Yard in Makiminato Service Area

Page 6 A full account of how chemicals drained into the sea water off the Makiminato Service Area

Page 7 Environmental investigation conducted for Chemical Storage Area at Makiminato Service Area

Page 8 Map of Chemical Field Storage Area at Makiminato Storage Area (Camp Kinser)

References

Page 9, 10 Act for Inspection and Protection of Chemial Material

Page 11,12 Act for Control of Poisonous and Power Medicine

Page 13 Agricultural Chemicals Control Act

A study that shows the cause of fish killed at the reclaimed land area off Urasoe-shi

It appeares that Dieldrin killed fish, and waste oil and cleaning materials drained into the area from the base (Camp Kinser) may have contributed to killing the fish.

Dieldrin drained into the reclaimed land off Makiminato Service Area

Residual substance of chemical materials, which were in the field storage of Makiminato Service Area in or about 1974, appears to be still remaining, and the reclaimed land area was saturated by the residual substance when it rained.

It appeares that the reclaimed land area was saturated by contaminated particle sand and fine aggregate in the construction of an entrance way to the reclaimed land area.

It appeares thta the reclaimed land area was saturated by contaminated particle sand and fine aggregate in the construction of drainage system (This system has been used to drain out residual water from the reclaimed land area).

Dieldrin was detected in the sea water, sediment and fish collected. About ten times value of Dieldrin was detected on 5 November (2nd collection) comparing with Dieldrin detected on 23 October (First collection).

Reason why it is not one-time incident.

Sediment collected at drain pipes installed in both base and reclaimed land area indicates almost the same value.

Details on how the dead fish were found

20 October 1986	Found waste oil leaking from base and draining into the reclaimed land area.
23 October 1986	Dead fish were found in the reclaimed land area
24 October 1986	Dead fish, sediment and waste oil were collected

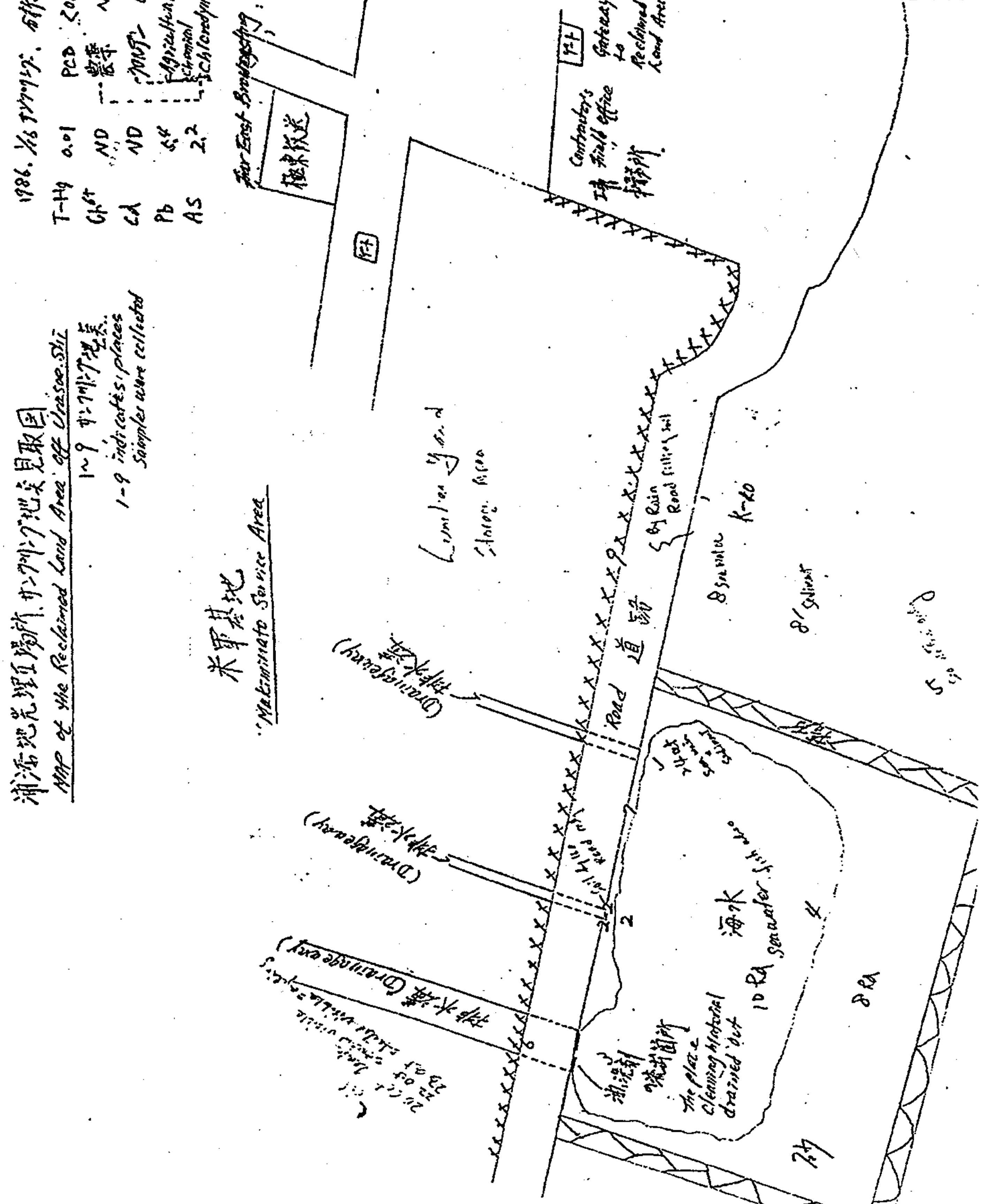
ANALYSIS OF INCIDENTS INVOLVING FISH KILLED AT THE RECLAIMED LAND AREA OFF CAMP KINSER (THE FIRST INVESTIGATION CONDUCTED ON 23 OCT)

Substance & its location detected	Dieldrin	Chlorodyne	PCB	Cd	Pb	Cr^{6+}	Phenol	Hg	As	PH	DO	MBAS
Seawater 1	ppb 0.016	0.006 ppb		ND	ND	ND	ND	ND	ND	9.4	9.18	0.07
" 2	0.014 "	"	"	"	"	"	"	"	"	9.7	12.8	0.15
" 3	0.015 "	"	"	"	"	"	"	"	"	8.8	3.52	1.59
" 4	0.006 "	"	"	"	"	"	"	"	"	9.8	10.51	0.02
" 5	ND	ND	ND	"	"	"	"			8.2	6.58	
Sediment 1	ppm 0.064	0.044	0.04	0.109	24.004	"		0.018	"			
" 2	0.039 "	0.296	0.06	0.200	24.276	"		0.017	"			
" 2-2	2.14 "	0.425	0.13	0.72	74.0	"		0.935	0.6			
" 3	0.055 "	0.022	0.06	0.124	18.368	"		0.016	ND			
" 4	0.003 "	ND	ND	0.066	0.261	"		ND	"			
Waste Oil	ND							0.015	"			
Gray Mullet (Muscle)	ppm 0.026	0.042	0.21					0.056	"			
" (Internal Organ)	0.783 "											
Rabbitfish (Muscle)	0.068 "											
Seawater in Lumber Yard (1984)	ND	0.004 ppb	ND	ND	ND	ND	ND	ND	ND	8.3	7.2	
Sediment	ND	0.004	ND	0.021	1.425	"		0.01	1.94			
Gray Mullet (Muscle)	ppm 0.025											
Rabbitfish (Muscle)	" 0.001											

Footnote: The value of Deildrion and Chlorodyne contained in seawater is shown by ppb, ppm is used for other substances.

ANALYSIS OF INCIDENTS INVOLVING FISH KILLED AT THE RECLAIMED LAND AREA OFF CAMP KINSER (THE SECOND INVESTIGATION CONDUCTED ON 11 NOV)

Substance & its location detected	Dieldrin	Chlorodyne	PCB	Cd	Pb	Cr^{6+}	Phenol	Hg	As	PH	DO
Seawater 1	0.012 ppb										
" 2	0.019 "										
" 3	0.011 "										
" 4	0.004 "										
" 5	ND										
Sediment 1	0.00103	0.021	0.02	0.08	8.0	ND		0.028	1.6		
" 2	0.11874	0.100	0.22	0.36	56.0	"		0.009	0.7		
" 3	0.00139	0.010	0.07	0.18	14.0	"		0.030	2.3		
4	0.00005	<0.001	0.07	ND	ND	"		0.063	7.8		
5	ND	"	"	0.03	ND	"		0.012	1.8		
6	0.00128	0.019	0.03	0.19	22.0	"		0.035	2.8		
7	0.01008	1.18	1.09	1.68	140.0	"		0.028	7.9		
8	0.00198	0.042	0.09	0.21	35.0	"		0.030	3.0		
9	0.5793	10.5	0.51	1.98	130.0	"		0.035	4.6		
Gray Mullet (Muscle)	0.206	0.098	0.27								
" (Internal Organ)	1.356										
" (Grills)	0.290										
Mudfish (Muscle)	0.046										
" (Internal Organ)	0.415										
Seawater 8	0.013 ppb										


MAP of the Reclaimed Land Area off Urasoe site
1-9 indicates places Samples were collected
Far East Broadcasting
Contractor's field office
Gateway to Reclaimed Land Area
Makiminato Service Area
(Drainageway)
(Drainageway)
(Drainage way)
Road
Seawater
The plate cleaning material drained out
T-Hg 0.01
AS 2.2
PCB 2.0

Incidents involving waste oil leaking at the reclaimed land off Lumber Yard in the Makiminato Service Area

20 Oct 1986	A contrctor's employee found waste oil leaking from the base and draining into the reclaimed land area.
22 Oct 1986	According to the employee, dead fish were found that evening.
23 Oct 1986	Received from Environment Section, Urasoe City Office information on the incident, and on-site investigation was conducted.

Summary of investigation

1. The site where the incidents occured

   The site is located in the water off Lumber Yard in the Makiminato Service Area, it has been under reclamation project by Urasoe Land Development Cooperation. The site is completely separated from the open sea, and forms a shape of a pond.

2. Site investigation

   Waste oil was draining out from the base and was floating around drainpipes. Waste oil was smelled and the surface of the water was dotted with dead fish.

3. Waste oil and dead fish were collected.

4. Summary of the reclaimed land

   The areas (18 he in total) have partially been reclaimed and the whole project will be completed by June 1987.

   The information on the incident was given to U.S. Forces (Navy Hospital), and requested to study the cause of the incident; and concurrent was made by U.S. Forces to collect waste oil.

24 Oct 1986 Reinvestigation was conducted based on information received from a contrctor stating that there are more dead fish in the area. Water and sediment were collected from five different places in the area off the reclaimed land. U. S. Forces personnel was the site to collect waste oil, however there was no waste oil visiable at that time. It was already spread around.

25 Oct 1986 For the present, dead fish were found in the pond of the reclaimed land area, but not in the open sea.

5 Nov 1986 Seawater and dead fish were collected.

Incidents involving chemicals drained from the Makiminato Service Area

The rain in the previous day made Malathion drain from Field Chemical Storage Area and dead fish were found at the seashore off the Makiminato Service Area.

14 Jan - 16 Jan 1975	Many dead fish were found at the seashore off the Makiminato Service Area
17 Jan 1975	Joint investigtion was conducted by Urasoe Municipal Office and Urasoe Fishery Cooperative Association

Investigation Summary

1. On-site Map — As attached

2. Kinds of chemicals found in the area

   Malathion, Acetic Acid, Oil, Battery Liquid, Developing Solution, and other various chemicals (Further information was expected from U.S. Forces but it was not available).

3. Vessels and Quantity

   Drums cans (150 cans containing 550 gallons, 40 cans containing 5 gallons)

   Malthion contained in wooden boxes, polyethylene bags and container, glass bottles and cans but quantity in each container was not identified.

4. Chemicals leaked from the rusted vessels contaminated the area. Marks of leaked chemical meet eyes at every turn. The site is located about 20m from the seashore and it is conceivable that chemicals percolated downward through the soil and drained into the sea.

5. Material collected: Soil, dead fish, seawater, seaweed. Chemical analysis for these materials is shown in the attached paper.

21 Jan 1975 Deputy Governor of Okinawa Prefecture had an interview with General Debit, Commanding General, the U.S. Army and protested against his imperfect management of the base operation.

24 Jan 1975 In response to a protest made by Deputy Governor of Okinawa Prefecture, General Debit, the U.S. Army, forwarded a letter to the Okinawa Prefectural Government stating that by 15 March deteriorated vessels containing chemicals would be replaced by new ones and they would be stored in good storge areas; and also stated that all chemicals would be withdrawn from Okinawa as soon as possible.

19 June 1975 All chemicals were withdrawn from Field Storage Area.

ENVIRONMENTAL INVESTIGATION CONDUCCTED FOR CHEMICL FIELD STORGE AREA AT MAKIMINAOTO SERVICE AREA

Sample collected	Soil	Fish	Seawater					Seaweed	Seawater		
Kind and Location of sample collected		Big Gray Mullet	Small Gray Mullet	B15	C9	C7	C5	Laver	B15	B5	C9
Date sample collected	17 Jan 1974	17 Jan 1974	17 Jan 1974	28 Jan 1974	28 Jan 1974	28 Jan 1974	28 Jan 1974	28 Jan 1974	3 Feb 1974	3 Feb 1974	3 Feb 1974
Dieldrin detected	ppm 11.04	ppm 0.058	ppm 0.076	ppb 0.18	ppb 0.12	ppb 0.07	ppb 0.10	ppb 83.0	ppb 0.02	ppb 0.03	ppb 0.02

* Remarks ADI Allowable dose of agricultural chemical to a human body per day (weight mg/50 kg)

$$\text{ppm} = \frac{1}{1{,}000{,}000}$$

Dieldrin 0.005 mg

$$\text{ppb} = \frac{1}{100{,}000{,}000}$$

* On the condition that a man will eat 100 gram of fish a day, the maximum permissible dose of Dieldrin to a human body is computed as follows.

Dieldrin 0.05ppm

Encl 10

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

5090.C9
Ser 1143/ 117
08 JAN 1990

From: Commander, Pacific Division, Naval Facilities Engineering Command
To: Commanding General, U.S. Marine Corps Base, Camp Smedley D. Butler

Subj: ENVIRONMENTAL STUDY AT CAMP KINSER SHORELINE

Ref: (a) MCB Camp Smedley D. Butler Engineering Service Request (ESR) No. 038-90
(b) NAVHOSP Okinawa ltr 6280 640 of 21 Dec 84

Encl: (1) Attachments to Reference (a)

1. Reference (a) requested that PACNAVFACENGCOM perform an environmental study to determine whether the Camp Kinser shoreline can be developed into a recreational beach area. The subject shoreline area was reported to have been used to store hazardous materials in the past, and previous sampling conducted in the 1970's indicates that the area may still be contaminated with hazardous substances.

2. We concur with reference (b) that additional sampling of the lumber yard and chemical storage and cleanup area at Camp Kinser be conducted. However, a study to determine the suitability of the area for recreational purposes would be a significant tasking based on the following factors:

a. The size of the suspected area of contamination is approximately 500,000 sq. ft. The wide range of pesticide values found in the previous sampling effort in 1970's indicates that hot spots may exist within the suspected area. According to the data, polychlorinated biphenyls may also be present in the soil. Detection of these hot spots would be extremely difficult and require extensive sampling.

b. Even after undertaking a major sampling and analysis effort, it would be difficult to conclude that the area is safe to use as a recreational beach because of the concern that all hot spots may not have been detected. The use of a former hazardous material storage site where past release is known to have occurred is not recommended because of the large potential liability in the event a user developed adverse health problems.

3. The estimated costs for a study would probably be in excess of $500,000. The potential cleanup costs cannot be estimated at this time.

4. We will be able to assist you with the requested study if:

a. Funds are made available for the investigation. Under current DOD guidance, centrally managed Defense Environmental Restoration Account (DERA) funds which are normally used in the United States and its territories for

Subj: ENVIRONMENTAL STUDY AT CAMP KINSER SHORELINE

these types of investigations cannot be used to perform work in foreign countries. Investigations of former hazardous waste spill or disposal sites in foreign countries must be funded by the activity or major claimant.

b. Our in-house environmental staff is increased to enable us to respond to environmental requirements in foreign countries. Currently, our existing in-house resources are committed to meeting the regulatory requirements in Hawaii and Guam. We have requested authority to increase our staff, and will notify you of any changes in our staffing which would allow us to respond to your request in a timely manner.

5. Should you be able to procure the necessary funding and desire to proceed with the investigations, please contact Mr. Clyde Yokota of our Environmental Branch at DSN 474-4510 or commercial (808) 471-3948.

E. TORNGREN
By direction

Copy to:
CMC
FMFPAC

ENGINEERING SERVICE REQUEST (ESR)
NAVFAC 11000/7 (4-78)
Supersedes NAVDOCKS 2038
S/N 0105-LF-016-0335

Instructions on Reverse

PWO

Copy No.

SECTION A FOR USE BY REQUESTER

1. FROM (Activity and location)
Commanding General, Marine Corps Base, Camp Smedley D. Butler, Okinawa, Japan

2. TO
Pacific Division, Naval Facilities Engineering Command

3. REFERENCE(S)

4. ESR IDENTIFICATION NUMBER (if applicable)
038-90

5. ENCLOSURE(S) (check)
☐ NAVCOMPT 140
☐ NAVCOMPT 2038
☐ NAVCOMPT 372
☒ OTHER (specify)
File on Chemical Storage Area cleanup at Camp Kinser

6. TYPE OF FUNDING (check)
☐ O&MN
☐ RIF
☐ NAF
☒ OTHER (specify)
O&M, MC

7. TYPE OF SERVICES REQUESTED
Perform soil and water sampling and analysis at Camp Kinser shoreline to determine suitability of shoreline for development of recreational beach area.

8. DESIRED COMPLETION DATE
ASAP

9. DESCRIPTION OF WORK
a. Using the enclosed file as a guide, conduct soil and water sampling and analys along Camp Kinser shoreline.
b. Interpret analysis results and provide recommendations on whether the shorelin area can be developed as a recreational beach area and will not pose a threat to human health.
c. If the analysis results show findings of environmental contamination, investig means for cleanup of contaminated area. Determine most effective measures for con of contaminant migration and site restoration. Provide cost estimate for measures to be taken.

10. POINT OF INFORMATION/CONSULT (Name and phone)
B. J. Almario, 635-7587

11. OFFICIAL REPRESENTATIVE (Signature)
J Mogle

12. DATE
13 Nov 89

SECTION B FOR USE BY EFD

1. SCOPE OF SERVICES

2. DATE RECEIVED

3. ESR NUMBER

SECTION C INTERIM ENDORSEMENT

1. REMARKS

2. EST. COMPLETION DATE

3. AUTHORIZED REPRESENTATIVE (Signature)

4. DATE

SECTION D FINAL ENDORSEMENT

1. ENCLOSURE(S)
☐ DRAWINGS AND MAPS ☐ SPECIFICATIONS ☐ REPORT
☐ OTHER (specify)

2. EST. COST (if applicable)
$

3. AUTHORIZED REPRESENTATIVE (Signature)

4. DATE OF COMPLETION

Encl 11

5000/2
14/64/460
9 May 90

POINT PAPER

Subj: Environmental Assessment of Camp Kinser Shoreline

BACKGROUND

1. The U.S. Army openly stored large amounts of hazardous materials and hazardous waste along the shoreline of Camp Kinser through the 1950's and 1960's. In December 1974, there was an unusual fish-kill off the Camp Kinser shoreline. The U.S. Army Environmental Health Engineering Agency (EHEA) was tasked to collect and analyze samples of water, soil, sediment, fish and other aquatic fauna to determine the cause. The EHEA study indicated high concentration of chlordane, DDT, malathion, dioxin, and polychlorinated biphenyl. Remedial action taken by the U.S. Army included repackaging leaking containers and disposing of waste materials. The EHEA report was not conclusive since it was not stated whether the soil was tested to determine the depth that the contaminants penetrated nor how the contaminated soil was disposed of.

2. Additional soil and water sampling and analyses were conducted by EHEA in February 1976. The levels of chlordane found approached those found in soil samples collected in December 1974. In November 1977, a joint study was conducted by the Okinawa Prefectural Government and the EHEA. Results showed high concentrations of heavy metals but low concentrations of pesticides.

3. In September 1984, the U.S. Naval Hospital, Okinawa (NAVHOSP) reviewed the results in past reports to determine if a recreational beach area could be established at Camp Kinser. NAVHOSP recommended that further sampling be conducted. In February 1985, additional soil samples were analyzed for dioxin. All samples tested negative; however, the shoreline remained closed to recreational activities as a precaution.

DISCUSSION

1. To certify that the former U.S. Army Storage site is cleaned of all hazardous materials would require an extensive survey to be conducted followed by a clean up of any residue found. All surveys to date have been cursory. In January 1990, a preliminary cost estimate of $500,000 to conduct the survey was provided by Pacific Division, Naval Facilities Engineering Command (PACNAVFACENGCOM). The high cost is due to the large size (500,000 SF) of the potentially contaminated area and the technical difficulty of detecting all hot spots in the soil. Extensive sampling would be required.

2. Defense Environmental Restoration Account (DERA) funds cannot be used to perform investigations in foreign countries. Surveys or follow on clean up efforts must be supported by O&M funds. The additional cost to clean up any hot spots found could be very high.

Subj: Environmental Assessment of Camp Kinser Shoreline

3. PACNAVFACENGCOM can not currently support the administration of a contract for an Environmental study in Japan. Their Environmental staff is currently committed to work in Hawaii and Guam. PWC Yokosuka or the U.S. Army Corps of Engineers could be asked to administer the contract. Both have the technical expertise; however, neither are currently staffed to support a large scale study on Okinawa. MCB Camp Butler does not have the technical expertise.

4. It is not prudent to use the area as a recreational beach even if no pollutants were found because of the known past use of the area as a hazardous materials storage site.

RECOMMENDATION: None, for information only.

ACTION OFFICER: CDR D. W. Peck, Public Works Officer, 635-7676/7677.

Encl 12

23 January 1991

HAZARDOUS WASTE SITE CAMP KINSER

I BACKGROUND

The initial identification of the existence of a problem was a fish kill of 19-20 December 1974. The fish kill took place offshore of the Army's MSA lumber yard. The source of the contamination was determined to be chemicals stored at the open yard.

1. Chemicals included insecticides, rodenticides, herbicides, inorganic and organic acids, alkalis, inorganic salts and organic solvents, and vapor degreasers.

2. The incident was studied by the U.S. Army Environmental Health Engineering Agency, Pacific. Interim report No. 90-011-75 of 9 January 1976 documents the investigation and initial cleanup.

3. The lumber yard covered the area west of the perimeter road from just south of the gym to the south gate.

4. The storage area covered approximately 500,000 sqft.

5. Cleanup actions were undertaken by the U.S. Army Garrison Okinawa, with technical guidance from U.S. Army Environmental Health Engineering Agency Pacific (EHEAP).

6. Chemicals primarily came from retrograde shipments from Viet-Nam and those declared excess as a result of phase down activities with Depot operations.

7. CINCUSARPAC directed reporting of all Okinawa excess chemicals to U.S. Army General Material Parts Center (AMC) in Dec. 1972.

8. U.S. Army Base Command Okinawa (USARBCO) was directed to package the chemicals for shipment to disposal sites in CONUS. Bids for the work of repackaging exceeded the funds available and inhouse labor undertook the action with limited success.

9. Sale of excess hazardous materials locally through Property Disposal had limited success. Many containers were in such poor condition that bidder refused to pick them up.

10. Through 1974 no deposition instructions were given USARBCO and the containers continued to deteriorate.

11. After the fish kill of 19-20 December 1974, soil and water samples were taken and indicated contamination had occurred involving the following pesticides in decreasing volume of release: malathion,

3. Analysis of samples taken in December 1974 indicated " High concentrations of PCB's, particularly aroclor 1260, have complicated the analysis of most samples". Their was no indication that tests were run for PCB's. (This needs to be examined)

II CLEANUP OPERATIONS

1. Local disposal included the following:

a. Cyanide Compounds were neutralized. The solution was flushed into the sanitary sewer system. The sludge was disposed of by burial at the "lime pit" located at the vacant lot across from the MSA theater. The old MSA theater, building 1300, was located just north of the Gym building 1303.

b. Ferric Chloride- was disposed of by land burial. 27,800 pounds of ferric chloride were buried across from the MSA theater in a 30 feet long x 10 feet wide x 5 feet deep trench.

c. Inorganic Acids and Alkalis- were neutralized and flushed over the lumber-yard grounds.

d. Organic Solvents and POL related Substances were transferred to a 15,000 gallon tanker located in the MSA 540 yard. (Need to determine ultimate disposal)

2. Repackaging Operations of pesticides were conducted. Chemicals were drained from existing drums and placed in new containers. Land burial was utilized for some items. These are listed in appendix V of the report. The site of the landfill is at "Camp Hansen coordinates 96572993 or 96423035 U.S. Army Topographic Map, Kin". (Coordinates match the existing Kin Dump site)

3. Empty pesticide containers were to be disposed of by smelting. Containers were transferred to Defense Property Disposal Office, Okinawa to contract for the service.

III FOLLOW-UP

1. Sampling by the Army continued through 1978 with test results showing a decreasing trend. The 1978 Army Pacific Environmental Health Engineering Agency, Sagami letter summarized that "necessity for continued sampling and analyses of the shore line area, with respect to pesticide levels in the soil and water, appears to be non-productive in view of these already documented facts."

2. In 1984 the Naval Hospital, Okinawa was asked to determine the acceptability of the offshore area at Kinser for recreational swimming. The Hospital reviewed the Army report and received additional information that no final report was conducted and that the Army's

3. Soil samples were taken by MCB Butler environmental engineer in 1985 and tested for dioxin (agent orange component). The test results were negative.

4. In October 1986 another fish kill took place offshore of Camp Kinser. It resulted from excavations associated with Urasoe city port facility construction. Drainage and road work took place in the area of the former Army lumber yard. Analysis of soil, water and fish contained elevated levels of pesticides chlordane and dieldrin, PCB contaminated oil and heavy metals. These are similar contaminates as found during the 1974 incident.

5. The use of the Kinser beach area was again investigated in November 1989. A request was made to Naval Facilities Engineering Command, Pacific Division to evaluated the past documentation and to make a recommendation as to the suitability of the area for recreational use. Their response indicated a detailed study is needed to make that determination. The estimated cost of that study is $500,000.

IV PRESENT CONDITIONS

1. The present issue is not the suitability of the area for swimming, but of the long term environmental concerns. Is a cleanup of the area necessary? What is the US Government's long term liability in the area?

2. A new cost estimate on a study to answer the environmental questions asked above is necessary.

DRAFTED BY

This summary was made by CDR Dale Peck the PWO, MCB Butler upon review of the existing Environmental Engineering files.