23 May 1996

MEMORANDUM FOR THE RECORD

From: Commander U.S. Naval Forces Marianas

To: Distribution

Subj: MINUTES ON THE RESTORATION ADVISORY BOARD (RAB) MEETING OF 8 FEBRUARY 1996

Encl: (1) RAB Attendance List
(2) Lower Sasa Fuel Burning Pond, FISC, Guam
(3) Removal Site Evaluation at Orote Landfill, NAVACTS, Guam

1. The Navy Co-Chairperson, LT Jean Dumlao-Hurst, Environmental Programs Officer, Commander U.S. Naval Forces Marianas (COMNAVMARIANAS) began the meeting at 1900 hours in the COMNAVMARIANAS conference room. LT Dumlao-Hurst did the opening remarks. Enclosure (1) lists all who attended the meeting.

2. Ms. Jocelyn Yamagata, Environmental Engineer, Pacific Division, Naval Facilities Engineering Command (PACNAVFACENGCOM), provided a brief overview of the Removal Action (RA) at the Lower Sasa Fuel Burning Pond, U.S. Fleet Industrial and Supply Center (FISC), Guam. The following questions and answers are provided:

a. *Question*: What type of sediment were tested? What were the results and how was it determined to be an ecological risk?

Answer: During the Remedial Investigation (RI), sediment samples were tested for total extractable petroleum hydrocarbons (TEPH), semi-volatile organic compounds (SVOC), total phenols, poly-chlorinated biphenyls (PCBs), pesticides, chlorinated herbicides, metals, cyanides, and volatile organic compounds (VOCs). Diesel, gasoline, kerosene, polynuclear aromatic hydrocarbons (PAHs), i.e., benzo(b)fluoranthrene, benzo(a)anthracene, and benzo(a)pyrene, and metals, i.e., lead, mercury, chromium, and arsenic were found. As a result of a toxicity test, it was determined these concentrations were toxic to the wetland's plants and animals. The toxicity test was conducted by exposing the test organisms, one in particular ***Hyalella azteca***, to the sediments. A total of eight sediment samples were tested. In particular, one of these sediment samples, which was collected from the drainage channel area, resulted in none of the ***Hyalella azteca*** surviving after being exposed to the sediment sample for a period of ten days. This was how the sediment was concluded to be toxic.

b. *Question*: What is the length of the drainage channel and where in the drainage channel were the samples collected?

Answer: The length of the drainage channel is about 20 feet long and the samples were taken from the drainage channel. Sediment

samples from other wetland areas throughout these areas were also collected, but the only one which killed the test organisms was the one taken from the drainage channel area.

c. *Question*: Where within the 20 feet were the samples taken? Was it taken immediately afterwards or immediately surrounding it? How was it determined it was just the drainage channel?

Answer: A lot of samples were collected throughout the wetland. Eight of those samples were used in the toxicity test and the samples taken in these areas showed the same kind of contamination which one sample had, which is how it was determined the focus should be on the drainage channel. The other samples throughout the wetland showed lower concentrations that would not affect the organisms.

d. *Question*: Is the natural water flow in the wetland tied with the Apra Harbor?

Answer: The natural gradient of the water flows towards the Apra Harbor.

e. *Question*: Are there any tidal effects in the whole area?

Answer: No testing was done to determine any tidal effects because the site is too far in to be affected by tides.

f. *Question*: What is the concern in the drainage area where a concrete U-shape structure is located?

Answer: There is this 2 feet area where no algae grew at all whereas everything above it is black with algae. A combination of heavy rain and possibly a very strong discharge might have caused the effect.

g. *Question*: What is the concern on the movement of the sediment and the movement of the water in the area? If the sediment is just a little, is it really much of an ecological risk or not?

Answer: More sediment samples will be collected in the next stage to better define the area which was contaminated before remediation. Based on the evidence which was found so far, it is warranted to go to the next step.

h. *Question*: Are the identified contaminants localized or does it have the tendency to migrate elsewhere?

Answer: It is localized and it is in the sediments. They are non-migratory types of contaminants. They adhered to the soil and are bound to the soil.

i. *Question*: In regards to the nature of the sediments are they pure coral or clay?

Answer: It is silty-clay.

3. Mr. Lawrence Landsdale, consultant with Ogden and Associates, provided a brief overview of the Removal Site Evaluation (RSE) at the Orote Landfill Site (enclosure (3)), NAVACTS, Guam. Mr. Landsdale presented results of the RSE at the Orote Landfill, NAVACTS, Guam. The landfill was used for military, residential, industrial and commercial waste from approximately 1944 to 1969. Flammable material was typically ignited and was pushed over the cliff and there are massive materials which exist on the beach as a result of the practice. Questions and answers were raised concerning the RSE:

a. *Question*: It was mentioned the soil in the landfill may pose a risk to humans and animals. What kind of actions would a person have to do? Is the concern from dermal contact or by ingestion? If the soil is a concern, what is the pathway which would affect the people, is it done by touching, walking on it, breathing, or eating it? What is the concern?

Answer: The concern is on the surface soil. Simply touching it and eating with your hands, without washing your hands first, would be an exposure. Although it is not a cancer risk, it poses a minor health risk and therefore, keeping a fence around it to keep people from touching the soil will be an effective solution until a more permanent measure such as capping is implemented.

b. *Question*: What types of waste is disposed in the landfill?

Answer: The landfill contains residential wastes, industrial wastes and construction debris.

c. *Question*: Were some wastes from motor pool operations, i.e., discarded batteries, oil, disposed in the landfill?

Answer: Because it is a landfill, samples were tested for everything such as petroleum related chemicals, PCBs, dioxins, furans, volatile organic chemicals, semi-volatile organic chemicals, metals, and pesticides. Motor pool type contaminants are included in the testing list.

d. *Question*: What type of contaminants were tested for? What were found?

Answer: In the RI Report, of December 1994, 93 soil and sediment samples were collected. These samples were tested for total fuel hydrocarbons in the range of gasoline, diesel and motor oil, semi-volatile organic compounds, volatile organic compounds, polynuclear aromatic hydrocarbons (fuel-related chemicals), metals, organic lead, chlorinated pesticides, PCBs, dioxins, furans, and asbestos. In the last RSE investigation, 31 soil and

sediment samples were collected and tested for total fuel hydrocarbons, semi-volatile organic compounds, volatile organic compounds, polynuclear aromatic hydrocarbons, metals, pesticides, and PCBs. Pretty much of everything tested for, were found in the landfill. Basically, it was an unregulated dump.

e. *Question*: Are there any migration of these contaminants out to Philippine Sea?

Answer: During the RI, a dye trace study was conducted to determine if there is any pathway from the landfill to the ocean. Dye was injected in the monitoring well and the dye was recovered in the coastal springs going out to the Philippine Sea. The result of the dye trace study confirmed the groundwater from the landfill can migrate to the Philippine Sea.

To determine whether the groundwater from the landfill may pose a risk to the marine life, bioassay tests and mathematical modeling were used. In the Draft RSE Report, coastal spring water samples and seawater samples were collected and used in a bioassay test. Fertilization and larval development tests using the sea urchin ***Strongylocentrotus purpuratus*** and survival tests using the fish ***Menidia beryllina*** were conducted to test the acute and chronic toxicity of the coastal spring water. The bioassay tests showed the coastal spring water does not pose a significant risk to marine life.

To test whether the coastal spring water will have any adverse acute or chronic effect in threatened or endangered species such as the sea turtle and the brown noddy, mathematical modeling was used to calculate the mass consumption and accumulation of contaminants in these species. The result of the modeling showed theoretically the sea turtles and the brown noddies will not be affected.

f. *Question*: Is leaching an issue here? Are the majority of the mobile chemicals already long gone or is there a possibility the chemicals will become mobile and continue to release?

Answer: Generally for landfills, a 30-year life is what is considered. Gas or leachate generation is usually asymptotic around 30 years. Which means, generally the contaminants in the landfill will all leach out after 30 years. However, not knowing what were placed in the landfill makes it difficult. But the leachate and the gas should be mostly gone. So the fast migrator, in this case the light contaminant, and the volatile contaminants are pretty much gone, but the heavy contaminant might still be remaining.

g. *Question*: Are there any ideas in disposing the debris on the beach?

Answer: The debris on the beach, if possible, would be picked up and placed in the landfill prior to the installation of a cap if the remediation alternative is to install a cap over the landfill. Due to the massive amount of metals involved in there, other alternatives such as encapsulation using gunite (a concrete type of material) will also be evaluated.

h. *Question*: How thick are the materials are on the beach? What is the depth or are they just scattered all over?

Answer: It was difficult to tell how thick the materials are at the beach since a lot of it is buried and it has been there for some time, the material is quite massive. Alternatives like gunite or some sort of cliff protection will be looked at and some of the metals which are loose will be transferred to the landfill.

i. *Question*: Are there risks from the break down of the metals and the other materials on the beach? Are there potential hazards from the biodegradation, or rust stain corrosion or anything in the steel metals which are out there?

Answer: The metals on the beach do not appear to be a risk for health purposes. It may be a trip hazard or some form of hazard, but it is not a chemical hazard.

4. LT Dumlao-Hurst addressed some of the pros and cons for consolidating Base Realignment and Closure (BRAC) RAB with our existing RAB and consolidating the BRAC 95 RAB with Tiyan's RAB. She also pointed out there are pros and cons handouts available. She is requesting the RAB board members develop a consensus or an idea of what the members would like in this new consolidation. PACNAVFACENGCOM must be advised in the near future of the RAB board members proposals.

Members of this RAB stated that if the new BRAC RAB does not have enough sites to stand alone, then it could be consolidated with this RAB. USEPA Region IX will be consulted.

5. The next RAB meeting will be on 23 May 1996 at COMNAVMARIANAS conference room. The agenda items will include:

a. Area Behind The Fence line at SRF, Guam;

b. Sasa Valley Fuel Burning Pond, FISC, Guam;

c. NEX Garage, NAVACTS, Guam; and

d. USS PROTEUS Site

Subj: MINUTES ON THE RESTORATION ADVISORY BOARD (RAB) MEETING OF 8 FEBRUARY 1996

6. The meeting adjourned at 8:20 p.m.

JEAN DUMLAO-HURST
LT, CEC, USN

Distribution: (w/o encl)
All RAB members
PWC, Guam (Codes 900, 910)
PACNAVFACENGCOM Pearl Harbor, HI (Code 18, 1824JF)

RESTORATION ADVISORY BOARD
8 FEBRUARY 1996
ATTENDEES

	NAME	ADDRESS/COMPANY	PHONE/FAX NO.
1.	ANDERSON, Robert D. Chief (Acting)	Dept of Aquatic and Wildlife Resource Dept of Agriculture 192 Dairy Road Mangilao, Guam	735-3942 734-6570
2.	MAANAO, Priscilla Staff Researcher	Senator H. Cristobals's Office Quan Bldg, Suite 201 326 West Soledad Avenue Agana, Guam 96910	472-3581 472-3585
3.	HUNT, Rose President	Guam Board of Realtors c/o Guam Realty P.O. Box 12817 Tamuning, Guam 96931	[redacted]
4.	GAWAL, Mike	Territorial Planning Council 103 Reflection Center 222 Santo Papa Agana, Guam 96910	472-9770 472-4772
5.	MYER, Robert Env Prot Spec	Environmental Department U.S. Naval Activities Guam	339-7051 339-4363
6.	SALAS, John F. Env Prot Spec	P.O. Box 7655 Agat, Guam 96928	[redacted]
7.	SILVA-KROTT, Ilse Assistant Director	University of Guam College of Agriculture/Life Sciences University of Guam Station Mangilao, Guam 96923	734-2575 734-6842
8.	CLEMENTE, Hiphil S. Student Trainee (CO-OP)	Fleet Industrial and Supply Center, Guam	339-6297
9.	WURCH, Victor Hydrogeologist	Guam Environ Protection Agency P.O. Box 22439 G.M.F., Barrigada 96921	472-8863 477-9402
10.	TAITANO, Conchita Env HazSub III	Guam Environ Protection Agency P.O. Box 22439 G.M.F., Barrigada 96921	475-1605 477-9402

ENCLOSURE (1)

11.	TSUTSUI, Roy Env Prot Spec	Commander U.S. Naval Forces Marianas	349-5241 344-5145
12.	LIZAMA, Frank Chief, DRMO Guam	12 Powers St. Santa Rita	339-5227
13.	YAMAGATA, Jocelyn Environ Engineer	PACNAVFACENGCOM Pearl Harbor, HI 96860-7300	(808)474-5959 (808)474-4519
14.	LANSDALE, Lawrence Civil Engineer	Ogden Environmental	[redacted]
15.	LAM, Helen Environ Engineer	PACNAVFACENGCOM Pearl Harbor, HI 96860-7300	(808)474-8911 (808)474-4519
16.	IGE, Darlene Supvy, Env Engineer	PACNAVFACENGCOM Pearl Harbor, HI 96860-7300	(808)474-4520 (808)474-4519
17.	MANTANONA, Eleanor D. Env Prot Spec	Environ Svc Dept U.S. Navy Public Works Center PSC 455, Box 195 FPO AP 96540-2937	339-8139 333-2035

REMOVAL ACTION AT THE LOWER SASA FUEL BURNING POND
U.S. FLEET AND INDUSTRIAL SUPPLY CENTER, GUAM

This Fact Sheet describes the ongoing environmental work at U.S. Fleet and Industrial Supply Center (FISC) Guam under the Installation Restoration Program. This is one in a series of informational flyers that will be issued periodically throughout the environmental restoration process.

Review of Remedial Investigation Results

A Remedial Investigation (RI) at the Lower Sasa Fuel Burning Pond was completed in June 1995. The RI found elevated levels of total extractable petroleum hydrocarbons (gasoline, diesel, kerosene, and lubricant oil) in sediment samples taken from the drainage channel area next to the pond. Oil and grease, metals, polynuclear aromatic hydrocarbons (PAH), and pesticides were also detected in the sediment samples. The location of the drainage channel area relative to the Fuel Burning Pond is shown in Figure 1.

A Human Health Risk Assessment performed as part of the RI concluded that the site does not pose a risk to humans. An Ecological Risk Assessment also performed as part of the RI concluded that the levels of PAHs and mercury found in sediment from the drainage channel and channel mouth area may be primary contributors to the identified ecological risk. The RI recommended a non-time-critical removal action at the Lower Sasa Fuel Burning Pond, to reduce or eliminate the ecological risk at the site presented by contaminants in the sediment.

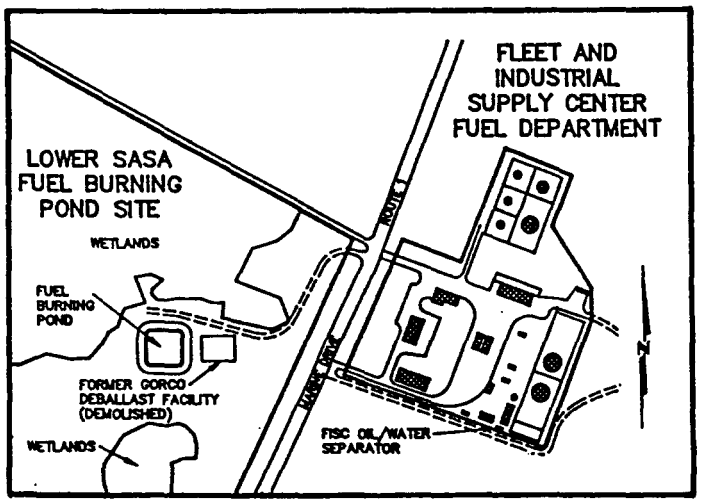

Figure 1. Site Plan

Removal Site Evaluation

A Removal Site Evaluation (RSE) is the first step in the non-time-critical removal action process. The RSE is designed to collect sufficient data to identify, evaluate, and select an appropriate response to the identified ecological risk at the site. Once collected, the RSE data will be evaluated and an Engineering Evaluation/Cost Analysis (EE/CA) will be prepared. The EE/CA will compare various removal action alternatives and identify the recommended alternative.

The following are specific objectives of the RSE:

- Determine which constituents and concentrations cause toxicity in sediment samples
- Determine extent of constituents of potential ecological concern
- Determine appropriate alternatives for removing toxicity from wetlands sediment

Proposed Removal Site Evaluation Activities

To accomplish the objectives listed above, the RSE proposes to include the following activities:

Site Preparation and Clearing. A grid consisting of cleared traverses will be constructed at the site to ensure precise control of sample locations,. Vegetation along traverse lines will be cleared manually using machetes or gasoline-powered chain saws.

Land Survey. Traverse lines and node points created by the intersection of east-west and north-south traverse lines will be surveyed by a licensed surveyor.

Sediment Sample Collection. Surface sediment samples will be collected by pushing or driving sample tubes into the ground by hand. Subsurface sediment samples will be collected by hand auger at a depth of two feet below

ENCLOSURE (2)

ground surface and immediately above the underlying bedrock.

Sediment Sample Analysis. Sediment samples will be analyzed for PAHs, total petroleum hydrocarbon, and selected metals (mercury, lead, copper). Analyses will be performed both in the field (using field test kits) and in Navy-approved laboratories.

Toxicity Tests. To determine what contaminants are contributing most significantly to the toxicity of the sediments, plant and animal toxicity tests will be conducted.

Treatability Studies. Biotreatment assessment of the sediment will be performed to determine optimum conditions for bioremediation of PAHs in wetlands sediment.

A draft RSE Sampling and Analysis Plan and a draft Health & Safety Plan for the work described above are available for review at the information repository in the Agana Public Library.

Potential Removal Action Alternatives

The following alternatives for reducing or eliminating the ecological risk at the site are being considered:

- Natural biodegradation (no action except for occasional monitoring)
- Limitation of access to the site
- In-place enhancement of biodegradation
- Removal of toxic sediments from the wetlands
- Combination of the above

These prospective removal action alternatives were preliminarily identified to determine the types and quantities of data needed for the RSE. These alternatives will be evaluated further in the EE/CA stage of the removal action process.

What To Expect Next

The Navy hopes to finalize the draft RSE Sampling and Analysis Plan and Health & Safety Plan in March or April of this year, incorporating comments received from regulatory agencies and the Restoration Advisory Board (RAB). Another RAB meeting will be held before the start of field work for the RSE.

The Navy anticipates completion of a draft EE/CA in the fall of 1996, at which time another RAB meeting will be convened to solicit comments on the draft document.

COMMUNITY INVOLVEMENT

This fact sheet is part of the Community Relations Program for the investigation and cleanup activities at the Lower Sasa Fuel Burning Pond Site.

The Community Relations Program is designed to keep you informed of planned or ongoing activities at the Navy's Installation Restoration sites and allows the opportunity to provide input into the decision-making process.

FOR MORE INFORMATION

The Navy values your input in our Installation Restoration activities. Your comments are invited and encouraged. If you have any questions or concerns about the Lower Sasa Fuel Burning Pond restoration activities, please contact the U.S. Naval Forces Marianas (COMNAVMARIANAS), at (671) 349-5241.

Copies of the Draft RSE Sampling and Analysis Plan and Health & Safety Plan are available for review at the Nieves M. Flores Memorial Library at Agana, Guam.

REMOVAL SITE EVALUATION
AT THE OROTE LANDFILL SITE
NAVACTS, Guam

Fact Sheet No. 1
January 1996

This Fact Sheet describes the ongoing investigation of potential contamination at Naval Activities (NAVACTS) Guam under the Installation Restoration (IR) Program. This is one in a series of informational flyers that will be issued periodically throughout the investigative process.

INTRODUCTION

This fact sheet provides updated information regarding the Removal Site Evaluation (RSE) that was conducted during July 1995 at Orote Landfill Site, NAVACTS Guam. The previous fact sheet dated December 1994 discussed the activities of the Draft Remedial Investigation (RI) conducted as part of the Navy's Installation Restoration (IR) program. The Draft RI concluded that cleanup was necessary because of contamination of soils at the site and recommended that an RSE be conducted prior to planning a removal action. The purpose of the RSE was to provide additional information in addition to the RI that will aid in the selection and design of removal action at the site.

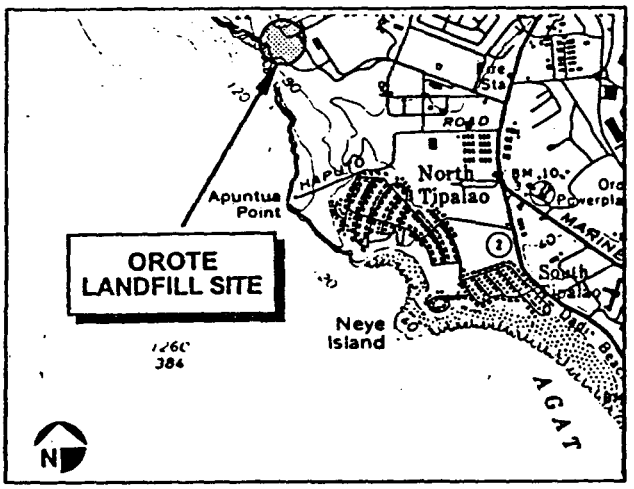

Figure 1. Location Map

BACKGROUND

The Orote Landfill Site occupies approximately 9.4 acres of land within NAVACTS on the southeastern portion of Orote Peninsula (Figure 1). The Orote Landfill was used for disposal of residential, industrial, and construction wastes from approximately 1944 to 1969. The face of the cliff that surrounds the landfill (Figure 2) was reportedly the most active disposal area. Flammable material was burned, and the ashes were buried on the cliff above the nearby cove. Nonflammable materials were either buried behind the cliff or bulldozed over the cliff onto the beach. The beach currently contains a large amount of rusted metal and other debris.

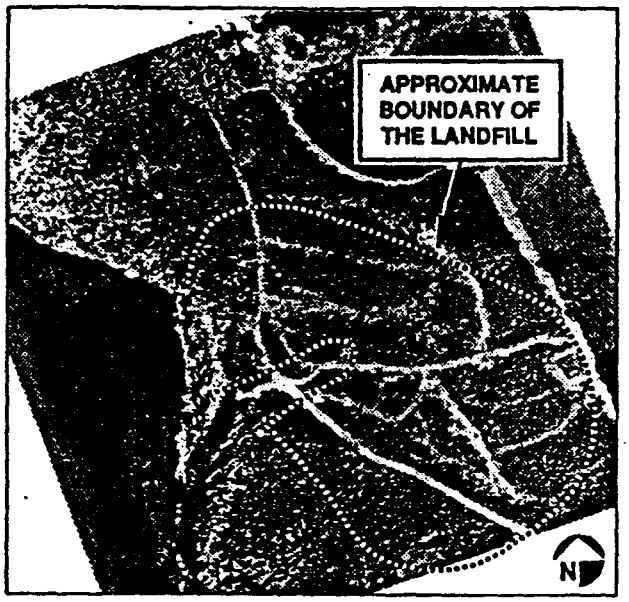

Figure 2. Aerial photograph of site showing the approximate boundary of the landfill.

Previous studies indicated the presence of two disposal areas, one just west of the cliff and beach and the other farther inland. A review of available aerial photographs and discussions with several U.S. Navy personnel suggest that the cliff and beach as well as the burning/disposal area inland, were used throughout the period of operation.

REMOVAL SITE EVALUATION RESULTS

An RSE was conducted at Orote Landfill Site. The RSE report describing the investigation was released in December 1995. The goals of the RSE were to (1) fully define the area of the landfill, (2) install additional ground-water monitoring wells including an upgradient well, and (3) further characterize the effect that the ground water at the site has on the ecology of the bordering ocean environment. The RSE found that the area of the Orote Landfill is 9.4 acres and has a volume of 87 acre-feet. The report also concluded that although the ground water may be slightly impacted by the landfill, the ground water does not have a significant effect on the ecology of the marine areas bordering the site. The information reported in the RSE will be used by planners and engineers to determine an appropriate removal action alternative at the landfill that is detailed in a document called an Engineering Evaluation/Cost Analysis (EE/CA).

ENCLOSURE (3)

FUTURE ACTIVITIES

The first step in the design of a removal action is a process of performing a study known as an Engineering Evaluations/Cost Analysis (EE/CA). The purpose of an EE/CA is to analyze different alternatives for remediating contaminated sites in order to select the best alternative. The EE/CA surveyed potential clean-up technologies and approaches and has proposed clean-up alternatives for analysis for Orote Landfill Site. The analysis of alternatives in the EE/CA for Orote Landfill Site were based on the information obtained from the draft RI and the draft RSE. The proposed alternatives for the site are as follows:

- placing a fence around the boundary of the landfill
- installation of a landfill cap
- complete removal of waste from the site
- cliff stabilization
- groundwater monitoring
- reestablish habitat

The EE/CA is currently under development and no alternatives have been recommended at this time.

After comments on the Draft RSE are received from the public and regulatory agencies, the RSE report will be finalized and reissued. Based on the information from the RI and the RSE, the Draft EE/CA will be prepared. An Action Memorandum will then be prepared, which will summarize the findings of the EE/CA and describe the clean-up alternative that is recommended for implementation at each site. After implementation details are finalized, a design package will be prepared for the selected alternatives at each site. Once the selected alternatives are implemented, clean-up activities will begin.

COMMUNITY INVOLVEMENT

This fact sheet is part of the Community Relations Program for the RI, RSE, and clean-up activities at Orote Landfill Site. This effort is intended to keep you informed of planned or ongoing activities at each site.

FOR MORE INFORMATION

For any questions, please contact the U.S. Naval Forces Marianas (COMNAVMARIANAS) at (671) 349-5241. The complete Draft RSE document is available for review at the information repository located at Nieves M Flores Memorial Library at Agana, Guam.