

November 16, 1972

Major General Frank A. Cann, USA
 Assistant General Manager for
 Military Application

Organization

FURTHER BACKGROUND ON "THE QUARANTINE OF RUNIT AFFAIR"

On May 22 (local time) Roger Ray sent his recommendation for the quarantine of Runit via teletype to the CG, SAMTEC, information to the SAMTEC operating contractor on Eniwetok, MATSCO (a department of GE), and the Manager, NV. This message was followed up by a telephone call from Mr. Ray to General Low to provide additional details. A copy of this message and a notation of the phone call is on file at NV. The PACE Test Group Director on Eniwetok, Mr. Bob Henny, was shown this recommendation by the MATSCO man, at which point he sent a verbatim transcript of it to Headquarters, DNA; FC, DNA; AWFL; and AFSC (Tab 1). Headquarters, DNA, apparently not having any background on the recommendation, sent a message (Tab 2) to Manager, NV, requesting further information on Mr. Ray's recommendation. Tab 3 is the reply to this request and relates in detail the events leading up to the recommendation to quarantine Runit. These events extended over a period of at least five days (May 17-22) from the discovery of suspicious particles on Runit to the confirmation that the particles were plutonium. During this period, the DNA representative (LTC Circeo--now transferred from DNA) was in company with Mr. Ray and the problem was discussed between them in detail. When the confirmation was received that the suspicious particles contained plutonium, the recommendation was prepared by Mr. Ray and coordinated with LTC Circeo. After receiving the recommendation, conducting his own investigation, and reading Tab 3, the CG, SAMTEC, quarantined Runit (Tab 4). Tab 5 is our original paper on this and other topics concerning Mr. Ray.

Comment: It appears that during the five-day period, Wednesday, May 17 to Monday, May 22, no contact was made by the DNA project

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officer to his headquarters informing Director, DNA, of a potential problem. Tab 1 is apparently the first General Dunn heard of the problem and by then he had no vote--but his own representative certainly was there and had ample opportunity to voice his opinions if they were in conflict with those of Mr. Ray. The lack of subsequent objection by DNA indicates that LTC Circeo and all others who were properly informed had no reason to contest the quarantine. I would also like to note that contrary to my own earlier understanding and that of General Dunn, Roger Ray did not broadcast the problem to the world unless SAMTEC is considered as being outside the family.

151
William W. Gay
Captain, USN
Assistant Director for Tests

Attachments:

- Tab 1: Message fm Eniwetok to DNA dated 5/23/72
- Tab 2: Message fm DNA to NV dated 5/24/72
- Tab 3: Message fm NV to DMA dated 5/24/72
- Tab 4: Message fm SAMTEC to Eniwetok dated 5/26/72
- Tab 5: Paper--"Certain Issues Involving Mr. Roger Ray"

Distribution:

- so: Camm w/Atts. & M&R
- cc: Test Rdr w/Atts.
- cc: WFW Rdr w/Atts.

PRIORITY
BT

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23 MAY 72

FM NAI/CO/PAGE/HENNY/ENINETOK BI
TO RUEAIIA/DNA/SPSS/LENTS/WASH DC
INFO RUMSBA/DNA/TC/RANDALL/KIRTLAND AFB NMEX
RUMSBA/AFSL/DEV/LAMPINS/KIRTLAND AFB NMEX
RUECABA/AFSC/OLW/GURNER/ANDREWS AFB MD

23 MAY 72 11z

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UNCLAS

THE FOLLOWING CRITICAL MESSAGE EFFECTING PACE IS RETRANSMITTED
SENT FROM R. RAY USAEC/NVOO WHILE AT KWAJALEIN TO ENINETOK ON
23 MAY 72.

QUOTE

USAEC NVOO RMR MAY 72

PRELIMINARY LABORATORY ANALYSES OF SAMPLES TAKEN DURING
RECENT SURVEY HAVE REVEALED A POTENTIALLY SERIOUS RADIATION
HAZARD ON RUNIT ISLAND (YVONKE) OF ENINETOK ATOLL. IT IS STRONGLY
RECOMMENDED THAT YOU QUARANTINE THAT ISLAND IMMEDIATELY, THAT IS
CEASE ALL OPERATION THEREON AND DO NOT REMOVE ANY VEHICLES,
EQUIPMENT OR MATERIAL UNTIL ADEQUATE DECONTAMINATION PROCEDURES
CAN BE ESTABLISHED. FURTHER DETAILED RECOMMENDATIONS WILL BE
MADE FROM USAEC NVOO ASAP.

WE HAVE NO REASON TO BELIEVE THAT ACTIVITIES TO DATE HAVE CAUSED
SIGNIFICANT PERSONNEL EXPOSURES. THE ABOVE RECOMMENDATION IS
INTENDED PRIMARILY TO PREVENT FURTHER AGGRAVATION THROUGH DISPERSION
OF AN ALREADY EXTREMELY DIFFICULT CONTAMINATION PROBLEM.

SAFTEC LO KWAJALEIN HAS INSTRUCTED O.L. ENINETOK TO IMPLEMENT THIS
INSTRUCTION PENDING YOUR FORMAL DIRECTION.

UNQUOTE:

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X		FCTD-T	
		FCTD-A	
	X	FCTD-P	
		FCTD-N	

24 May 72

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HTTUZYUW RUERDGA0908 1451952-UUUU--RUWSSBA.***

ZNR UUUUU

P R 241945Z MAY 72

FM HQ DNA WASH DC

TO RHNNEAA/ MANAGER USAEC NV00 LAS VEGAS NEV

INFO RUWSSBA/ AFWL KIRTLAND AFB NMEX

RUWSSBA/ COM FC DNA KIRTLAND AFB NMEX

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UNCLAS DNA 00479 SPSS SENDS. AFWL FOR MR. HENNY.

FC FOR PCTD MAJ RANDALL.

SUBJECT: QUARANTINE RUNIT ISLAND (YVONNE) OF ENIWETIK ATOLL.

1. REFERENCE: MESSAGE FROM R. RAY USAEC/NV00 TO USAEC NV00 KMR 23 MAY 1972.

2. REQUEST ADDITIONAL INFORMATION REGARDING THE REASONS FOR RECOMMENDING THE IMMEDIATE QUARANTINE OF RUNIT ISLAND (YVONNE) OF ENIWETIK ATOLL. PLEASE FURNISH DETAILS OF THE RECENT RADIATION SURVEY AS TO WHAT TYPES OF INSTRUMENTATION WERE USED, HOW MANY SAMPLES WERE TAKEN, FROM WHAT LOCATIONS, FROM WHAT DEPTHS, AND THE RESULTS OF LABORATORY ANALYSIS OF THE SAMPLES.

3. REQUEST THAT YOU ADVISE DNA OF THE HAZARDS INVOLVED IN OPERATION ON RUNIT AND WHAT ACTION HAS BEEN TAKEN ON RECOMMENDATIONS OF R. RAY.

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(X)	FCID-T		
	FCID-R		
X	FCID-P		
	FCID-N		

Jep 25 May 72

21 MAY 1972

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CZCQTA713

PTTUZYUW RHWNEAA0111 1460036-UUUU--RHEGAAAIG 00

1972 MAY 26

ZNR UUUUU

U.S. ATOMIC ENERGY COMM
TWX UNIT

P 250035Z MAY 72

FM ROBERT E MILLER MGR USAEC NVOO LAS VEGAS NEV

TO RHEGAAA/AGMMA DMA USAEC WASHDC

RHEGAAA/DIVISION OF OPERATIONAL SAFETY USAEC WASHDC

RUEBDBA/DIRECTOR DNA WASHDC

RUWJSLC/COMMANDER SAMTEC VANDENBERG CALIF

INFO RUWSSBA/AFWL KIRTLAND AFB NMEX

RUWSSBA/COM FC DNA KIRTLAND AFB NMEX

AE

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UNCLAS/OFFICIAL USE ONLY/

RADIOLOGICAL CONDITIONS RUNIT ISLAND (YVONNE) ENIWETOK ATOLL
THE NUMBER OF NUCLEAR DEVICES EXPLODED ON RUNIT AND SUBSEQUENT
EARTH AND DEBRIS MOVING ACTIVITIES HAVE RESULTED IN A COMPLEX
RADIOLOGICAL SITUATION IN WHICH EACH UNIT DIVISION OF ISLAND
IS UNIQUE FROM ADJACENT UNITS. HISTORICAL RECORDS CONTAIN
CONTRADICTIONARY REPORTS OF RADIOACTIVE WASTE DISPOSAL ACTIONS
AND RESULTS WHICH MAKE THIS APPROACH TO SITUATION EVALUATION
UNRELIABLE. PARA.

ACTUAL SURVEYS HAVE BEEN SUPERFICIAL BUT HAVE IDENTIFIED THE

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PAGE 2 RHWNEA0111 UNCLAS/OFFICIAL USE ONLY/

PRESENCE OF A PLUTONIUM BEARING SAND LAYER OUTCROPPING ON THE OCEAN SIDE OF THE MIDISLAND AREA AND THE EXISTENCE OF APPARENTLY SOLID PLUTONIUM BEARING CHUNKS, GRAINS AND OTHER PARTICULATE ON THE ISLAND SURFACE. THE AREAS CONTAINING THIS SURFACE CONTAMINATION ARE NOT YET DELINEATED BUT APPEAR TO BE EXTENSIVE. PARA. SCRAP METAL DEBRIS IS EXTENSIVE, LOCATED THROUGHOUT THE ISLAND. NEARLY ALL SUCH METAL APPEARS ACTIVATED WITH INDIVIDUAL PIECES INDICATING AS MUCH AS NINETY MR/HR CONTACT. GENERAL ISLAND EXPOSURE RATES HOWEVER ARE USUALLY QUITE LOW ABOUT 5 - 10 MICRO R/HR WITH THE MAXIMUM AROUND THE CACTUS CRATER AREA OF ONE MR/HR. THE ISLAND CAN BEST BE DESCRIBED AS A HETEROGENOUS CONGLOMERATION OF NUCLEAR TEST DEBRIS OF VARIOUS RADIO- ACTIVITIES FROM THE SURFACE TO THE MAXIMUM DEPTH OF SOIL DISPLACEMENT (I. E., WATER TABLE), IN WHICH THE ACTUAL RADIOLOGICAL CONDITIONS CAN BE EVALUATED ONLY ON AN INDIVIDUAL SAMPLE BASIS. PARA.

THE ABOVE -DESCRIBED SITUATION WAS GENERALLY RECOGNIZED BY AEC AND AEC-SPONSORED PERSONNEL AT THE CONCLUSION OF THEIR SURVEY OF ENIWETOK ON MAY 17, 1972. IT WAS DISCUSSED IN DETAIL WITH PACE PERSONNEL AT ENIWETOK WITH CERTAIN PROCEDURAL RECOMMENDATIONS.

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HOWEVER, AT THAT TIME THE EXISTENCE ON ISLAND OF PIECES OF METALLIC PU, THOUGH SUSPICIONED, WAS NOT ESTABLISHED. PARADNA AND PACE REPRESENTATIVES WERE INFORMED OF THIS SUSPICION AND WERE ASSURED THAT EVERY EFFORT WOULD BE MADE TO OBTAIN A POSITIVE LABORATORY DETERMINATION ON AN EXPEDITED BASIS. THREE METALLIC FRAGMENTS WITH CENTIMETER RANGE DIMENSIONS WERE HANDCARRIED TO THE UNIVERSITY OF WASHINGTON FOR ANALYSIS. BY A REPORT WHICH REACHED KWAJALEIN EARLY MONDAY, MAY 22, THE ASSISTANT MANAGER FOR OPERATIONS, NV, WAS INFORMED THAT THE LABORATORY DETERMINATION WAS POSITIVE. PARA.

BASED UPON THE HISTORY OF TEST ACTIVITIES ON RUNIT, IT MUST BE INFERRED THAT THERE ARE BOTH LARGER AND SMALLER FRAGMENTS STILL ON THE ISLAND, THAT THE QUANTITY IS UNDOUBTEDLY LARGE AND THAT FIELD DETECTION, IDENTIFICATION AND RETRIEVAL WILL BE EXTREMELY DIFFICULT. ALTHOUGH IN THE PAST WE HAVE BEEN PRIMARILY CONCERNED WITH THE RADIOLOGICAL SAFETY OF THE PEOPLE WORKING IN CONTAMINATED OR POSSIBLY CCONTAMINATED AREAS, THE PRESENCE OF DISCRETE PIECES OF METAL HEAVILY CONTAMINATED WITH PLUTONIUM PRESENTS A NEW AND SERIOUS CONCERN. VEHICLES INCLUDING TRACKED VEHICLES ARE KNOWN TO HAVE BEEN USED ON RUNIT AND TO HAVE TRAVERSED THE AREAS OF

CONCERN. EACH OF THESE VEHICLES AS WELL AS EACH PERSON AFOOT ON THE ISLAND AND SUBSEQUENTLY VISITING OTHER ISLANDS OR RETURNING TO ENIWETOK ISLAND PRESENTS A POTENTIAL VEHICLE FOR THE SPREAD OF CONTAMINATION THROUGHOUT ENIWETOK ATOLL, THE TRANSPORTATION CONVEYANCES AND ELSEWHERE. BECAUSE THE SITE MANAGER AND THE HOST AGENCY, SAMTEC, HAVE AT ENIWETOK ATOLL NEITHER THE NECESSARY PROCEDURES NOR THE NECESSARY RESOURCES TO IMPLEMENT APPROPRIATE PROCEDURES, THE RECOMMENDATION WAS MADE TO THE COMMANDING GENERAL, SAMTEC, THAT HE IMMEDIATELY QUARANTINE RUNIT ISLAND. PARA.

THE TEXT OF THE RECOMMENDATION TO CG, SAMTEC WAS AS FOLLOWS:

USAEC NVOO KMR MAY 72.

PRELIMINARY LABORATORY ANALYSES OF SAMPLES TAKEN DURING RECENT SURVEY HAVE REVEALED A POTENTIALLY SERIOUS RADIATION HAZARD ON RUNIT ISLAND (YVONNE) OF ENIWETOK ATOLL. IT IS STRONGLY RECOMMENDED THAT YOU QUARANTINE THAT ISLAND IMMEDIATELY, THAT IS CEASE ALL OPERATIONS THEREON AND DO NOT REMOVE ANY VEHICLES, EQUIPMENT OR MATERIALS UNTIL ADEQUATE DECONTAMINATION PROCEDURES CAN BE ESTABLISHED. FURTHER DETAILED RECOMMENDATIONS WILL BE MADE FROM USAEC NVOO ASAP.

PAGE 5 RHWNEAA0111 UNCLAS/OFFICIAL USE ONLY/

WE HAVE NO REASON TO BELIEVE THAT ACTIVITIES TO DATE HAVE CAUSED SIGNIFICANT PERSONNEL EXPOSURES. THE ABOVE RECOMMENDATION IS INTENDED PRIMARILY TO PREVENT FURTHER AGGRAVATION THROUGH DISPERSION OF AN ALREADY EXTREMELY DIFFICULT CONTAMINATION PROBLEM.

SAMTEC LNO KWAJALEIN HAS INSTRUCTED O. L. ENIWETOK TO IMPLEMENT THIS INSTRUCTION PENDING YOUR FORMAL DIRECTION.

SGD ROGER RAY.

NV HAS INFORMALLY OFFERED TO CONSULT WITH AND ASSIST BOTH DNA AND SAMTEC IN DEVELOPING FUTURE COURSES OF ACTION. THIS MESSAGE REITERATES AND FORMALIZES THAT OFFER. OA:RR

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ZNY EEEEE ZOV RUEBDBA1025 REROUTE OF RUWJSLC1084 1471730

P R 261730Z MAY 72

FM SAMTEC/SE/VAFB CA

TO WTOE/SAMTEC/LO/ENIWETOK MI

RUHHABA/SAMTEC/AL/HICKAM AFB HAW

RUEBDBA/DNA USAEC/WASHDC

RUEBDBA/DIRECTOR DNA/WASH DC

INFO RUWSSBA/DNA/TDCT-I/KIRTLAND AFB N NMEX

RHWNEAO/USAEC/NV00/LAS VEGAS NEV

RUWJEBASAMSO/SG/LOS ANGELES AFS CA

RUWSSBA/AFWL/KIRTLAND AFB N MEX

BT

UNCLAS E F T O FROM SE.

ENCIPHER FOR TRANSM.

THIS MESSAGE CONFIRMS TELECON BETWEEN SAMTEC(SE) AND SAMTEC OL,
ENIWETOK, 24 MAY 72.

ALL OPERATIONS ON RUNIT ISLAND (YNONNE) OF ENIWETOK ATOLL WILL
CEASE IMMEDIATELY. THE ISLAND WILL BE QUARANTINED. NO EQUIPMENT
OR VEHICLES WILL BE REMOVED UNTIL ADEQUATELY DECONTAMINATED. IN
ACCORDANCE WITH AEC/SAMTEC APPROVED OR DIRECTED PROCEDURES, ONLY
MINIMUM ESSENTIAL PERSONNEL ARE AUTHORIZED ACCESS TO THE ISLAND
UNTIL USAEC NV00 RECOMMENDATIONS ARE RECEIVED. SUCH PERSONNEL

PAGE TWO RUWJSLC1084 UNCLAS E F T O

WILL BE AFFORDED DOSIMETER/RADIAC DETECTION DEVICES AND BE UNDER POSITIVE CONTROL AT ALL TIMES.

EVERY PRECAUTION SHOULD BE AFFORDED PERSONNEL TO PREVENT EXPOSURE TO POTENTIAL RADIATION HAZARDS. FURTHER DIRECTION WILL FOLLOW.

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CERTAIN ISSUES INVOLVING MR. ROGER RAY

Quarantine of Runit

In mid-May 1972, as our preliminary radiological survey of Eniwetok was being completed (and concurrent with the visit of the Marshallese traditional leaders), Roger Ray learned that the radiological survey party had retrieved on Runit Island three pieces of debris which it was then believed might contain metallic plutonium. These fragments were returned by special courier to the University of Washington for priority analysis. Upon completion of the Marshallese visit to Eniwetok, the party returned to Kwajalein and, while there, Mr. Ray received the results of the analysis and it confirmed that the particles were almost certainly metallic plutonium. Knowing the probable source of this material and, therefore, that a large quantity of plutonium probably remained on Runit, he became deeply concerned that no measures were being taken or were available to prevent serious contamination of people, equipment, vehicles, and marine craft. Lacking such measures, plutonium contamination of Eniwetok Island and even aircraft departing therefrom might occur. He immediately consulted with the DNA PACE Project Officer and with the SAMTEC Liaison Officer on Kwajalein and informed them that he felt it his responsibility to cause preventive actions to be taken. To that end he prepared and coordinated with the aforementioned individuals a teletype to the Commanding General, SAMTEC, at Vandenburg AFB, recommending that the CG, SAMTEC, Major General Low, invoke a quarantine until appropriate controls could be established. As soon as he reached Honolulu and was able to discuss this matter by telephone, he telephoned the Acting Manager, NV, to initiate the necessary follow-on actions.

Meeting Between Mr. Ray and Brigadier General Brickel

Sometime before the September 7 interagency meeting, Mr. Ray and Dr. Walt Norvik of Livermore discussed the matter of laboratory analytical workload

supporting the Eniwetok program. Recognizing that most of the available laboratory capacity which was then available to us was already heavily committed, Dr. Nervik suggested that McClellan had the technical capability and he understood, informally, would welcome the opportunity to participate. Recognizing that such participation would probably require a directive or mission assignment from Washington, Mr. Ray decided that it might be useful to discuss the feasibility of such an assignment with someone from Dr. Carl Walske's office before formally requesting that the Department of Defense provide such support. Since he knew General Brickel and knew also that General Brickel would be at the interagency meeting, he called General Brickel and asked if they might have a brief conversation subsequent to the September 7 meeting on a subject which he felt would not be appropriate to discuss on the telephone. As it turned out, General Brickel had a commitment back at the Pentagon immediately after the interagency meeting and invited Mr. Ray and Dr. Nervik to drop by his office for coffee and conversation. The substance of the conversation was to ask General Brickel if he felt that Dr. Walske would support a request for McClellan laboratory assistance, if and when such a request were made. Subsequently, a formal request originated by Manager, NV, was passed through DMA to DNA, with the hoped-for result.

Pullout of Eniwetok at Time of Typhoon Olga

The total evacuation of Eniwetok on October 23 was directed by CG, SAMTEC, in light of a prediction that the typhoon would do severe damage to the Atoll. The return to Eniwetok 36 hours later was intended as a reconnaissance in force to determine whether the survey program could be resumed. The departure of all AEC and DNA personnel from Eniwetok at about 1300 local on October 25 was dictated by a statement from the Site Manager that he could not support any project personnel at that time. The time of departure from Eniwetok for Kwajalein was dictated by operational requirements at Kwajalein for the evacuation aircraft. Having consulted

with the Site Manager immediately before departure, Mr. Ray was convinced that there was essentially no likelihood that the AEC survey could be resumed for at least two weeks. He had at that time approximately 20 survey personnel on Kwajalein who could do nothing productive at that location. He was aware of severe competition for space on MAC flights from Kwajalein to Honolulu and was aware also of the fact that a MAC passenger flight was then at Kwajalein destined for Honolulu with seats probably available. With ten minutes available before takeoff of the evacuation aircraft for its return flight to Kwajalein, Mr. Ray's only means of communication with Kwajalein was by telephone to the Coast Guard LORAN Station at Eniwetok, thence by Coast Guard radio relay to the Coast Guard Station at Ebeye, thence to the Air Operations Office at Kwajalein. Over this circuitous route, he passed instructions to have all members of his survey team who could be accommodated manifested on the MAC flight for Honolulu--there to await further instructions. In some way this instruction was interpreted to apply also to the Holmes and Narver people who had been participating in the DNA engineering survey and, as a consequence, they too were aboard the MAC flight to Honolulu.

Liaison with Helicopter Pilots

Upon return to Kwajalein on October 25, Mr. Ray received a telephone call from Lt. Colonel Joe Robinson of Marine Air Group 36 on Okinawa advising that MAG 36 was committed to provide helicopter support at Eniwetok commencing about November 1. Colonel Robinson had heard that the survey was in some difficulty due to Typhoon Olga and asked whether MAG 36 should continue with its deployment plans. Mr. Ray advised that, in his judgment it was doubtful that the mission could be accommodated at Eniwetok as early as November 1. Lt. Colonel Robinson informed Mr. Ray that it was feasible for the CH-53 helicopters to stage from Kwajalein

and asked whether it would be reasonable for them to come ahead on approximately November 1 and remain at Kwajalein until Eniwetok could receive them. Lt. Colonel Robinson indicated that he had already asked Kwajalein whether the necessary support could be made available and asked Mr. Ray to follow up on that question. Mr. Ray advised Colonel Robinson that he could not and would not modify the existing deployment and support request but that he would see to it that an appropriate modification to the request was sent to CINCPAC. Late that same evening, CAPT McDyer of the First Marine Air Wing in Japan telephoned Mr. Ray at Kwajalein to confirm the understanding with MAG 36. These two telephone calls, neither of which was originated by Mr. Ray, were his only direct communications with military organizations other than DNA concerning the helicopter resources. The following day, however, Mr. Ray received an information copy of a First Marine Air Wing message to COM, Seventh Fleet, wherein he was badly misquoted as to the extent of storm damage at Eniwetok. Mr. Ray, therefore, originated a message correcting that information. By this time, the Manager, NV, had asked Mr. Ray to come to Honolulu to meet with him, and so, in the message correcting the storm damage information, Mr. Ray requested a coordinating meeting with appropriate CINCPAC representatives in Honolulu. Director, DNA, was made an info addressee on that message. On the same morning, Mr. Ray met with LCDR Brown and Mr. Earl Gilmore. They discussed with representatives of KMR the proposed revised helicopter program and related KMR support requirements. During this period on Kwajalein, there were frequent discussions of alternatives with LCDR Brown and Mr. Gilmore and H&N; however, each group had its own detailed problems to deal with, thus the message from "Ray to CINCPAC" was not coordinated in advance with the DNA representative but was shown to him soon after it was dispatched.

Reschedule of Survey Program (Stretch-out)

The initial survey schedule was developed by NV to optimize the use of the resources which had been furnished during a time window which was

constrained by several external influences. Its revision was dictated by the impact on the typhoon-related delay and of certain logistics factors of which all concerned are now aware. It must be understood that even in the original schedule for the field survey, it was not anticipated that the soil survey results could have any timely and meaningful impact upon cost estimating by DNA in the February 1973 time-frame. There were, numerous discussions on Kwajalein with the DNA engineering survey personnel. DNA was assured at that time that NV would continue to support the engineering survey on whatever schedule DNA might adopt. The revision of the schedule for the radiological survey was an attempt to maintain momentum and assure utilization of the committed helicopter support. The program as outlined recognizes that the survey is now decoupled from Palumbo and, to all intents and purposes, from PACE. Thus the window for field operations is less constrained and more optimum scheduling now is possible considering impact upon base support. The program also puts the hazardous and most physically demanding soil and biota program at a time when improving rather than deteriorating weather may be expected.

November 1972