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CL 15

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TO: G. L. Felt, CTG 7.1 DATE: 1 February 1957
FROM: Robert H. Campbell, J-6
SUBJECT: TAONGI ATOLL - CONSTRUCTION AND SUPPORT REQUIREMENTS
SYMBOL: J6-3465

411376

- ENCLOSURES: A. H&N CONFIDENTIAL DI Ltr LA-1886 dtd 30 Jan '57
to J. B. Sanders, Subj: Taongi Atoll - Construction
and Support Requirements
- B. J6 CONFIDENTIAL DI Sk. E-454 dtd 1 Feb '57
Title: Proposed Taongi Master Plan

As directed during discussions of possible uses of Taongi Atoll held on 2 and 3 January 1957 (J3-H-28 and 29 dtd 15 and 16 Jan '57 respectively) we have examined the construction and support implications of using Taongi Atoll as a firing site.

Two situations have been examined:

1. The minimum condition described by Mr. Gibbins during the 3 January meeting which considers a telemetering station and tower as the only scientific requirements necessary ashore for HARDTACK.
2. A maximum condition - which might represent the eventual use of the Atoll - consisting of a combination of the facilities found on Enyu Island and the Yurochi Complex of Bikini Atoll.

Estimates of the construction and support requirements under these two situations in terms of manpower, time and money are contained in Enclosure A.

The concept of HARDTACK advanced by UCRL is certainly of a minimum nature; we feel, however, that if the Atoll is once used subsequent operations may result in an expansion of its facilities. We feel rather strongly that if there is to be any development of Taongi Atoll it should be accomplished in a fashion compatible with ultimate expansion to an installation comparable to a combination of the facilities now found on Enyu Island and in the Yurochi Complex of Bikini Atoll. With this in mind, Enclosure B is suggested as an embryo master plan. It features:

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1 February 1957

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1. A timing, telemetering and communications facility (similar to Sta. 70 - Enyu) on the southernmost bit of real estate to reduce its vulnerability to shot damage as much as possible.
2. A small craft channel and landing in the location recorded in H. O. Publication No. 165A and H. O. Field Chart No. 4012. We assume that this location was logically selected from on-site information originally.
3. An alpha station on the most northern land mass since by nature of the measurement it must be the closest station to a shot and we desire to keep shots as far north as possible to minimize their effect on Item 1 above.
4. An airstrip on Pokaaku Island - rather than on the northerly end of Sibylla Island as H&N proposed in Enclosure A - as close to Item 1 above as flight safety permits.
5. A photo station south of the alpha station at a distance roughly equal to the separation between CASTLE Stations 1210 and 1342.
6. A camp located for convenience near the airstrip and boat landing since there is no invulnerable location on this Atoll for a camp.

In conclusion we wish to interject two cautions: Enclosure A was necessarily quickly prepared and assumes construction conditions at Taongi Atoll are no worse than those at Bikini and Eniwetok Atolls - this assumption may prove false and necessitate an upward revision of these estimates. Further, there exists interrelations between the items listed in the cost summaries which precludes elimination of individual items without appropriate adjustments in the costs of the remainder; i.e., elimination of the LST landing in the minimum condition would certainly increase the difficulty of building the telemetering station and hence would increase its cost.

Robert H. Campbell
Robert H. Campbell,
J-6

RHC:jjr

Enclosures A & B as above

Distribution:

7 - G. L. Felt, CTG 7.1, w/7 ea. Enc. A & B

2 - J6 Files

CC 15

HOLMES AND NARVER, INC.
Engineers--Constructors
828 So. Figueroa Street
Los Angeles 17

C
O
P
Y

U. S. Atomic Energy Commission
Contract No. AT-(29-2)-20

Mr. Joe B. Sanders
Assistant Director, Test Division
U. S. Atomic Energy Commission
P. O. Box 5400
Albuquerque, New Mexico

30 January 1957

Subject: TAONGI ATOLL - CONSTRUCTION AND SUPPORT REQUIREMENTS

Dear Mr. Sanders:

Purpose. This report covers the requirements for the construction of scientific and support facilities for an operation in Taongi Atoll. As a basis for this report a maximum and minimum requirement has been assumed. The maximum scope contemplates the construction of stations similar to Castle Stations 1210, 1342, 1550, Station 70 (Nan) with a 300 foot tower, the mooring of five scientific barges within the lagoon and the provision of camp and other support facilities. The minimum scope of work assumed was the construction of a station similar to Station 70 (Nan), a 300 foot tower, the mooring of five barges within the lagoon and a minimum of camp and other support facilities.

Accessibility of Taongi. There is no safe passage into the Atoll in its present state for landing craft. The study and appraisal of the construction requirements and the cost estimates have been predicated on being able to provide the needed access. From a study of charts, photographs and other information available it appears feasible to initially land equipment and materials on the southwestern reef at low tide. Wheeled or tracted vehicles might be landed at this point and then moved to dry land during the hours of low tide. From this initial undertaking we expect to construct operating islands along the route for the storage of equipment during periods unfavorable for working on the reef. The feasibility of the above approach can only be determined by an on-site survey. This survey would also determine the best location for an entrance channel which we propose to construct. Such a survey could also determine whether a suitable anchorage for supporting vessels exists to seaward of the Atoll.

Camp Facilities. It is proposed to first establish a beachhead camp from which our activities might be expanded. The site location of the camps will be determined during the on-site preliminary survey that is expected will be made. It will be necessary to subsist and sustain the first group of construction personnel on the supporting vessel until the beachhead camp can be established. A 200-man camp of standard design (similar to Fox camp of Redwing) is proposed for maximum requirements. For the minimum requirements we contemplate either a 100-man camp ashore or a barge type barrack for both messing and housing. The costs provided hereinafter for camp facilities to support the minimum scope of work have been estimated to be the same for ashore or afloat operations. The camp facilities will be so planned that they may be expanded on an "as needed" basis.

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Enc: A

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Communications. Communications will be required for the maximum and minimum scope as follows:

- (1) Two-way teletype and voice, Elmer-Taongi.
- (2) Two-way teletype and voice, Nan-Taongi.
- (3) Taongi to ships (ship to shore).
- (4) Telephone system.
- (5) Submarine cable system for signal, control and telephone circuits.

It has been assumed that radio communication equipment will be government furnished and the radio and telephone terminal will be located in the Station 70 type structure. At site Elmer additional equipment and antennas for the Taongi circuits will be required and the power demands of the additional equipment determined. At site Nan it is proposed to establish the communication facilities in the new building presently contemplated, by decreasing the work space.

It is imperative that a complete investigation of an over-all system be made prior to deciding on equipment, rather than building a system piecemeal.

Airstrip. An airstrip is contemplated only for maximum requirements. It will be 150 feet wide, and 4500 feet long with 25 foot shoulders on each side. It will be designed for C-47 wheel loads. A 400' x 500' parking area is contemplated.

The runway section will consist of an 8" coral rock sub-base with a 4" coral rock surface course. The shoulders will have a 4" coral rock course over sub-grade.

The airstrip will be located at the northerly end of Sibylla Island. However, if the winds are more easterly than now assumed the airstrip will be more centrally located on the island with a bearing slightly east of northeast.

The entire site will be cleared of trees and underbrush. A control tower, runway and field lighting or markers, wind direction indicators and other facilities as generally required by the military using agency have been contemplated.

Seadrome. A seaplane landing area for both maximum and minimum requirements has been proposed. The landing area will be 1000 feet wide, 10,000 feet long and will have 15 feet depth at mean low water to provide for the heavier type aircraft. The landing area will be located in the lagoon off Sibylla Island parallel and opposite the proposed airstrip. The exact location will be determined by boat anchorage or mooring area clearance requirements.

The landing area must be clear of obstructions for 1000 feet at each end and so located to permit a 1:50 glide slope. A channel from the landing area to a concrete ramp 50 feet wide will be provided. Day and night marker buoys will outline the landing and channel areas. Mooring buoys will be located as necessary. Control tower with radio communications will be as determined by the military using agency.

Causeways. Causeways connecting Pokaakku and Sibylla Islands with an estimated total length of 3700 feet is contemplated only for the maximum condition. The causeways will be of coral sand fill with rip rap used on the slopes where excessive erosion is likely. The crown width will be 24 feet with roadway surface stabilized with coral sand.

Harbor Facilities. For both maximum and minimum requirements a channel 300 feet wide with a depth of 20 feet at mean low water is proposed. The probable location is in the area south of Pokaakku Island or in the southwestern reef. The exact location will be determined from the site survey. For purposes of estimating costs we have assumed the length of the channel excavation to be 1000 feet.

A mole 75' x 150' long is proposed on the lagoon side for the maximum condition only.

The entrance channel and the approach to the mole contemplates the use of LSTs. It is assumed that the scientific barges will be outfitted at site Elmer and moved to Taongi in an LSD or under tow by a seagoing tug. Presently we contemplate that these barges will be taken in tow by LCMs and LCU off the entrance channel for movement into the lagoon. The feasibility of such an operation will require further study of current and sea conditions in the channel and in the operating area off the Atoll.

Construction Equipment. The cost estimates hereinafter provided cover both construction and operation equipment for the maximum and minimum scope contemplated. The equipment planned is that considered essential for the construction of the scientific stations, camp and the other service and support facilities. Any changes in the magnitude of the contemplated scope of work will be reflected in a change in equipment requirements.

Marine craft requirements will depend entirely on the modus operandi of gaining access to the Atoll. For planning purposes we assume approximately 4 LCMs, 2 LCUs, and 6 DUKWs will be required for both maximum and minimum conditions.

Foundation Investigations. We contemplate an early exploration party to obtain drilling core records and samples of the island soil and coral cap and the reefs for test and evaluation at the Elmer Laboratory.

Surface and Air Support. It is assumed that an LSD will be made available during the early construction period. This type vessel can carry loaded LCMs and LCUs with which we have assumed the first landings on the southwestern reef can be made. The use of an LST for these landings does not appear feasible. The water drops off to great depths just off the reef and it is doubtful that an LST would be able to use its stern anchor.

The LSD type vessel is the best suited to act as the mother ship for our craft during the early construction period. We do not know whether an anchorage to seaward of the Atoll exists or whether LSD operations will have to be accomplished with the vessel lying to. The docking facilities of the LSD make it very suitable for picking up our craft rapidly in case of bad weather. We will need the support of the LSD until we can make sufficient progress on the channel to permit passage of our landing craft. Thereafter we will require continuous and independent support of an LST.

The support of seaplanes for emergency evacuation or other emergency needs will be required until the airfield is constructed. On completion of the airfield we assume that airlift support will be similar to that provided on the Eniwetok-Bikini run during Redwing.

Because of the meager information available to us with respect to large vessel operations off the Taongi Atoll it seems logical that a representative of the agency that will furnish the support vessels accompany our first reconnaissance party. The method of operations and the support that we may expect can thereby be determined more realistically.

Construction Schedule. For the minimum scope of work contemplated it is estimated we will require 65 construction and 35 operation personnel for a period of 6-1/2 months. The maximum scope of work will require 120 construction and 80 operation personnel for a period of 7-1/2 months. These schedules cover on-site construction only; a minimum of four months must be added to these schedules for procurement and shipment of material and equipment. In estimating the time schedule it has been assumed that the topography of the proposed airstrip site will be similar to that of Nan and that beaches for landing craft, coral deposits, trees, underbrush and other conditions will be similar to those of other atolls in which we have operated.

Cost Estimates. The items of work contemplated and the cost estimates are summarized in the following tables:

Minimum Requirements

	<u>ITEM</u>	<u>ESTIMATED COST</u>
1.	Beachhead	12,000
2.	Camp (As Fox-Redwing)	325,000
3.	Access Channel - 20' Deep	686,000
4.	Concrete Station (As Station 70 - Redwing)	295,000
5.	300' Steel Tower (As Station 5 - Redwing)	343,000
6.	Five (5) Barge Anchorages	222,000
7.	Inter-Atoll Communications	243,000
8.	Submarine Cable	200,000
9.	Seadrome	96,000
<u>TOTAL MINIMUM CONSTRUCTION</u>		2,422,000

RECAPITULATION

Construction Equipment	471,340
Operational Equipment	35,000
Construction Projects	2,422,000
<u>TOTAL</u>	2,928,340

Maximum Requirements

	<u>ITEM</u>	<u>ESTIMATED COST</u>
1.	Beachhead	12,000
2.	Camp - 200-Man	450,000
3.	Airstrip	560,000
4.	Access Channel - 20'	686,000
5.	3 Concrete Stations as Redwing	1,013,000

Maximum Requirements (Continued)

	<u>ITEM.</u>	<u>ESTIMATED COST</u>
6.	Five (5) Barge Anchorages	222,000
7.	Seadrome Facility	96,000
8.	Inter-Atoll Communications	243,000
9.	Submarine Cable	613,000
10.	300' Steel Tower	343,000
11.	Concrete Station (Redwing - Station 70)	295,000
12.	Access Roads & Causeways	180,000
13.	Mole Type Pier	98,000
TOTAL CONSTRUCTION		4,811,000
<u>RECAPITULATION</u>		
	Construction Equipment	1,022,510
	Operational Equipment	50,000
	Construction Projects	4,811,000
	TOTAL	5,883,510

Very truly yours,

HOLMES & NARVER, INC.

/s/ S. P. Howell (AHG)
Project Manager

cc: Mr. F. W. Hohner, AEC Constr. Representative
Mr. R. Campbell, J-6, LASL

C
O
P
Y

OAKAKKU I. PASSAGE

CAUSEWAY

SOUTH I. (NAN)

PROPOSED TYPE 70 STATION

CL 15

168° 55'

10 20 30

SCALE : THOUSANDS OF FEET

14° 35'

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LASL J-6 SKETCH	
PROPOSED TAONGI MASTER PLAN	
Date: 2/1/57	Drawn by: R.H.
Doc. Ref: J6-3465	No. E-454

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Incl: B

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CL 15

14° 35'

PROPOSED CAMERA STATION

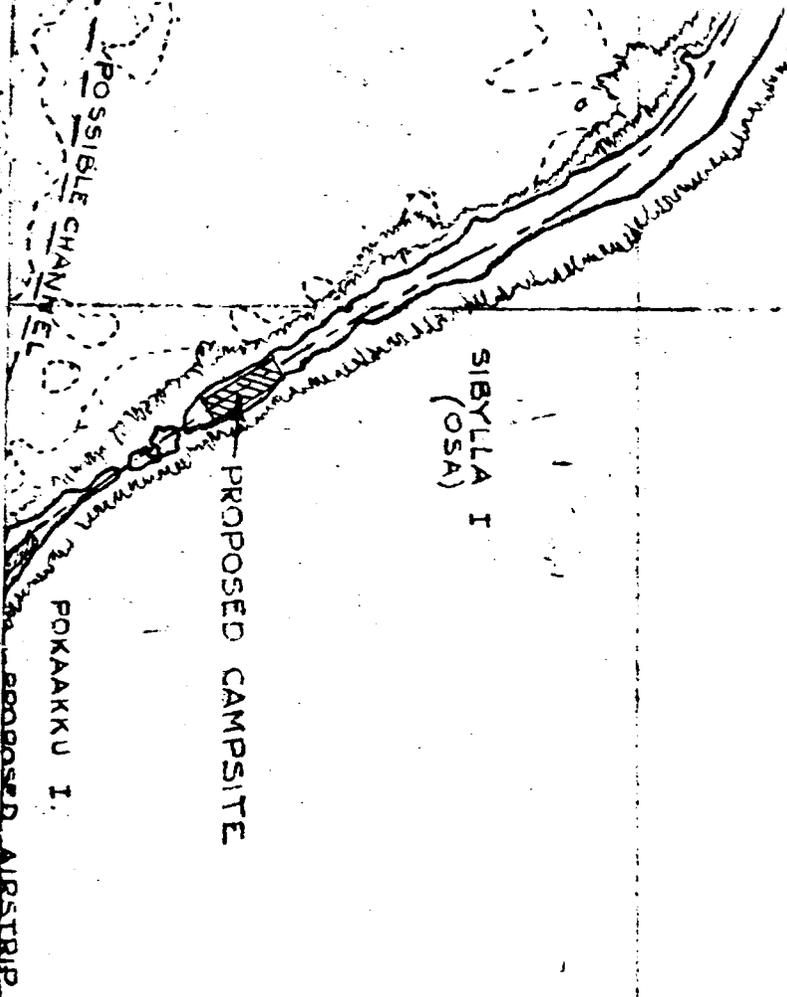
SIBYLLA I
(OSA)

PROPOSED CAMPSITE

POKAKKU I

PROPOSED AIRSTRIP

POSSIBLE CHANNEL



169°

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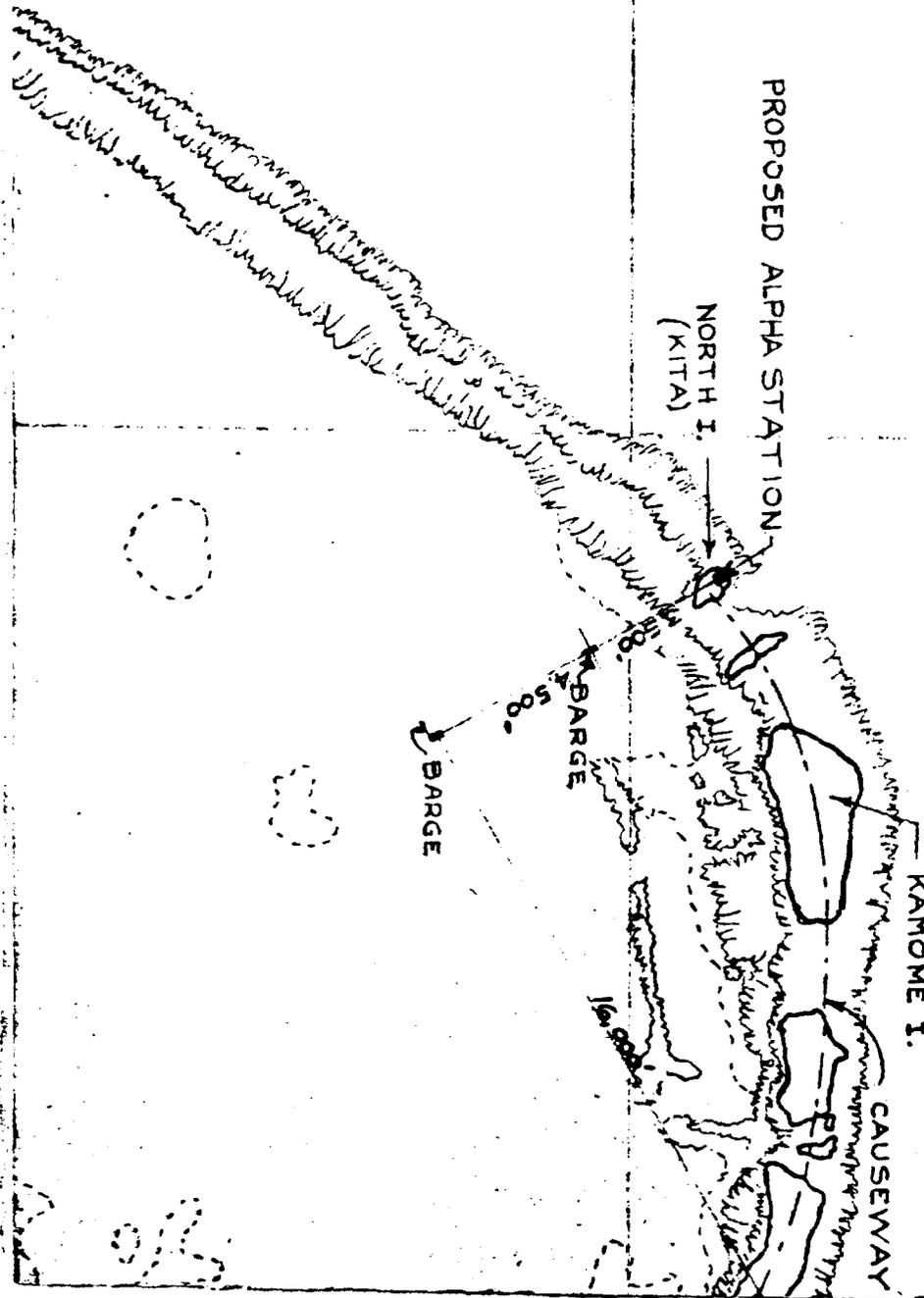
169°



PROPOSED ALPHA STATION

NORTH I.
(KITA)

14° 40'

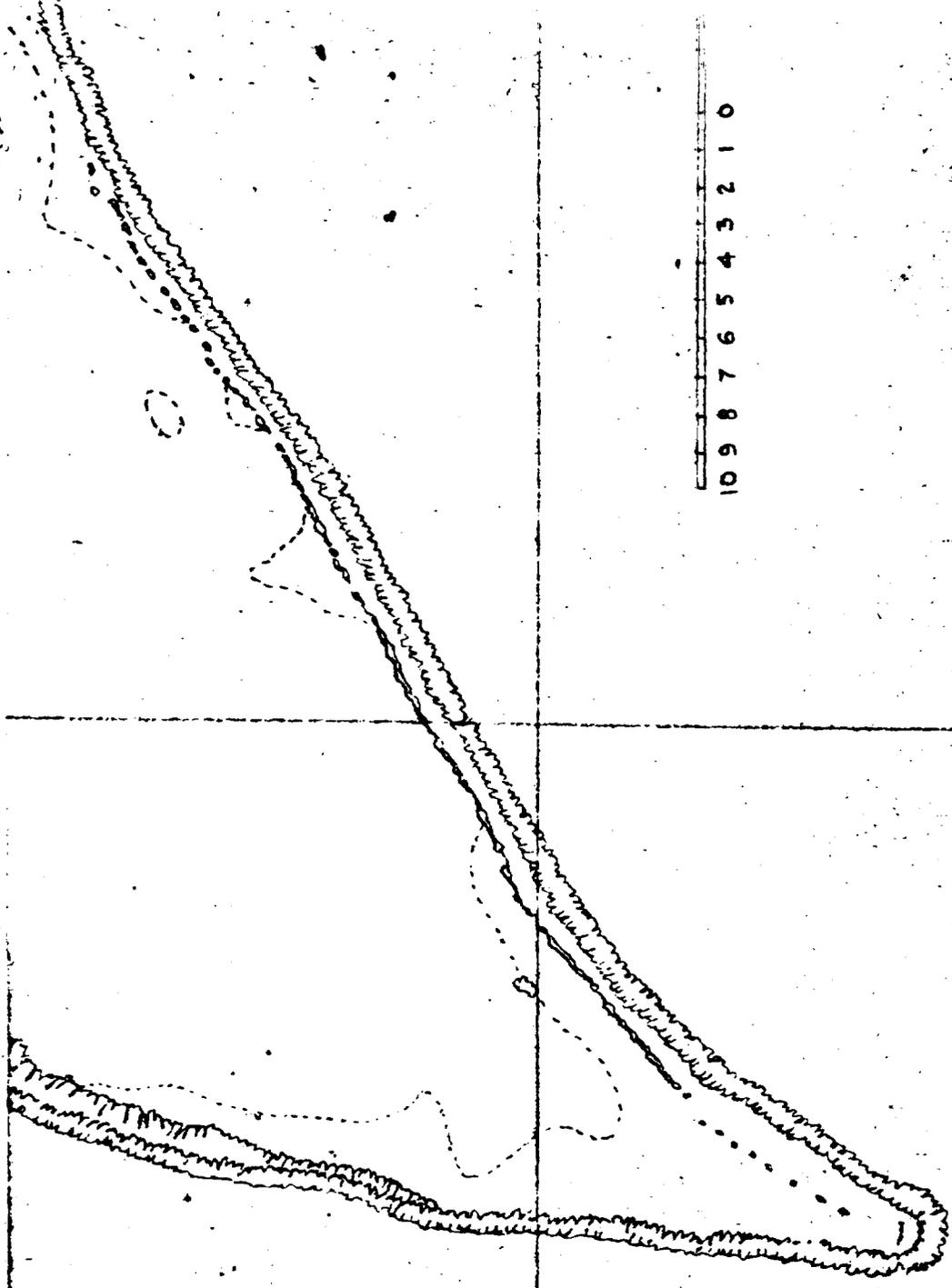


CL 15

109876543210

14° 40'

168° 55'



	D-DAY	D/1	D/2	D/3	D/4	D/5	D/6	D/7
1 LSD:								
2 LSD's:								

LSD awaits results of radiological survey before discharging small boats.

Small craft reenter lagoon.

LSD departs for Eniwetok.

Shot barge for next event loaded into LSD.

LSD departs for TAONGI.

LSD arrives at TAONGI. Unloading and moving of barge starts.

TAONGI LSD SUPPORT

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