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Chemical Operations Division

MACJ3-09

31 October 1968

MEMORANDUM FOR: 7TH AIR FORCE, TACC
ATTN: LTC ROBERT McCOLLESTER

SUBJECT: Herbicide Damage to Vegetable Plots Vicinity Da Nang Air Base

1. Discussion:

A. On 18 October 1968 Mr. E. M. Stickney, CORDS Agricultural Advisor, I CTZ, Da Nang called Colonel John Moran, Chief Chemical Operations Division, Headquarters, MACV, to discuss possible herbicide damage to vegetables in the vicinity of Da Nang Air Base. It was Mr. Stickney's opinion that the damage had been caused by leaks from Ranch Hand herbicide aircraft which habitually fly over this area as they depart from and return to Da Nang Air Base. Colonel Moran agreed to send a representative from MACV COC-7 and an agriculture representative from USAID to investigate the damage.

B. On 25 October 1968 Mr. Barry Flamm of USAID and Major Hidalgo of COC-7 went to Da Nang to conduct the investigation. Mr. Stickney, Mr. Flamm and Major Hidalgo visited Detachment 1, 12th SOS at Da Nang on 25 October and discussed the problem with the Detachment Commander, LTC Larsen. LTC Larsen pointed out the flight patterns used by Ranch Hand aircraft for take offs and landings. This is shown on the attached map. The flight patterns shown are those used the greatest percentage of the time; however, on occasion the patterns are reversed if the wind is from the north.

C. There are no herbicide targets in the vicinity of Da Nang (the nearest is approximately 20 km away); therefore, any damage from aircraft would necessarily be from herbicide leakage during departure from and return to the airbase. LTC Larsen stated that a strenuous effort is made by his maintenance personnel to prevent leakage. This includes inspection and replacement of faulty nozzle valves prior to each mission. In spite of these precautions leakage does occur on occasion.

D. Upon completion of the interview with LTC Larsen, Mr. Stickney, Mr. Flamm, Major Hidalgo and CPT Watts of Ranch Hands visited the Hoa Vang District to observe first hand the effects on a demonstration

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vegetable plot. (Note: This was the area of heaviest damage and is located directly south of the airbase) According to Mr. Stickney, the area had previously contained a variety of healthy young vegetable plants (tomatoes, chinese cabbage, ect.). On or about 28 September, the plants began to show signs of damage, and at the time of the inspection all the plants were dead. Some trees in the area, notably jak and palm, also showed signs of damage. There was no discernible pattern to damage such as a discrete swath, but rather the damage seemed to cover the entire area. CPT Watts noted that the damage in this particular area could have been due to aircraft leakage especially on those infrequent occasions when the aircraft make their final approach over Hoa Vang. It is highly unlikely that leakage would occur on take off or at any time prior to actual spraying in the target area. When leakage does occur it is due to faulty valve operation after the spray mission.

9 E. On 26 October Mr. Stickney, Mr. Flamm and Major Hidalgo visited other areas where damage had occurred. The damage was not nearly as bad in these areas. Also, it is significant to note that most of these areas lie outside of the flight pattern of the herbicide aircraft. In addition, vegetables are being grown in East Da Nang (area shown in brown on map) where there has been no damage, yet Ranch Hand aircraft habitually overfly this area. Another factor which quite possibly is contributing to the vegetable damage is the disposition of empty herbicide drums. Numerous drums were noted throughout the areas of light damage north and west of the airbase. Although supposedly empty, these drums could contain small amounts of herbicide which when vaporized would be sufficient to cause damage to the highly susceptible vegetable plants. These drums were noted in the hamlets being used for trash containers and water barrels. Since the herbicide is controlled by ARVN, they also control the disposition of empty drums. During the inspection Mr. Flamm found limited evidence of natural crop damage due to insects and plant diseases.

2. Conclusions:

A. It is possible that some of the vegetable damage in the vicinity of Da Nang Air Base was caused by herbicide leakage from Ranch Hand aircraft, especially in the Hoa Vang demonstration plot.

B. Damage in other areas was not directly traceable to aircraft leakage, and in fact, it is highly probable that any herbicide damage there was due to vapors from empty drums.

3. Recommendations:

A. That Ranch Hand continue to exercise close supervision over the maintenance of spray nozzle valves in order to prevent leakage.

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B. That in the future, demonstration vegetable plots not be located in proximity to the Ranch Hand flight pattern.

C. That a request be made to the ARVN depot at Da Nang to closely control the disposition of empty herbicide drums. (Note: Mr. Stickney said he would do this)

1 Incl

as

+ Mr B. Flamm's report

JOHN MORAN

Colonel, USA

Chief, Cal OPns Div

Copy furnished:

Mr. E. M. Stickney, CORDS, I CTZ

LTC P. Larsen, CO, Det 1, 12th SOS

Mr. Barry Flamm, USAID, Saigon

File

October 31, 1968

Barry R. Flamm, Chief
Forestry Branch

Trip Report - Danang - October 25-26, 1968

At the request of Col. John Moran, COC 7, and Mr. E.M. Stickney, Senior Ag. Advisor I-CTZ, I went to Danang with Major Pete Hidalgo, I-Corps Chemical Officer from COC 7, to examine possible accidental herbicide damage to vegetable crops.

Mr. Stickney reported herbicide damage to vegetable crops south of the Danang Air Base at Hoa-Vang and to the north and west of the base.

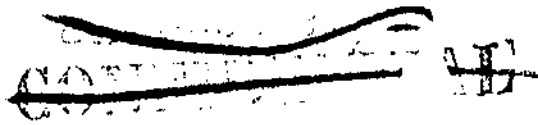
Major Hidalgo, Stickney and I visited Ranch Hand Detachment Headquarters to explain trip objective and to obtain information on the defoliation operation. We spoke to Ltc. Larsen, Detachment Commander and Captain Watts, Pilot, and learned the following:

1. Nearest targets have been at least 20 kilometers from Danang
2. The Danang Airport runways lie north and south. Generally take offs and landings are to the south. Approaches are made over the Danang river.
3. Spray equipment is inspected for leaks, etc. prior to take off.
4. Spring loaded valves on spray nozzels open under pressure and close automatically when pressure is cut off. Foreign obstacles may prevent proper valve closure.
5. Ltc. Larsen stated that nozzels sometimes leaked on return flights.

Captain Watts accompanied Major Hidalgo, Mr. Stickney, Eddie Chin (Chinese - Agriculture Team Leader) and I for an examination of a vegetable demonstration plot at Hoa-Vang. According to Messrs Stickney and Chin, the Crops had been destroyed by herbicides. As the crops had been plowed under, they could not be examined. However, some penennial broad leaf plants showed typical effects of herbicides.

A C-130 passed almost directly over us while we were at the plot. Captain Watts said this would be the same pattern that Ranch Hand would fly under these wind conditions.

The objective of the demonstration program is to encourage farmers to produce vegetable crops. According to Mr. Chin, vegetable crops average 750,000 \$VN/ha



as compared to an ave of 50,000 \$VN/ha for rice. The Danang area could grow the vegetables for military and civilian use that is now principally imported from Dalat.

On October 26, we examined areas west and north of the Airport. The area north of the Airport showed little damage. An area west of the Airport still showed some effects from herbicides possibly about 30 days old. Manioc plants indicated there had been herbicide contact.

As herbicide damage west of the airport from leaky valves did not fit our other information, we searched for other explanations. We found scattered throughout this area and every where else, herbicide barrels being used for water containers animal troughs, trash, etc. This could be a serious source of contamination to the entire area.

Major Hidalgo informed us that the herbicide and the barrels were property of ARVN thus complicating corrective action.

Conclusions

Damage in the Hoa-Vang area is principally from occasional leaky valves on spray planes returning from missions.

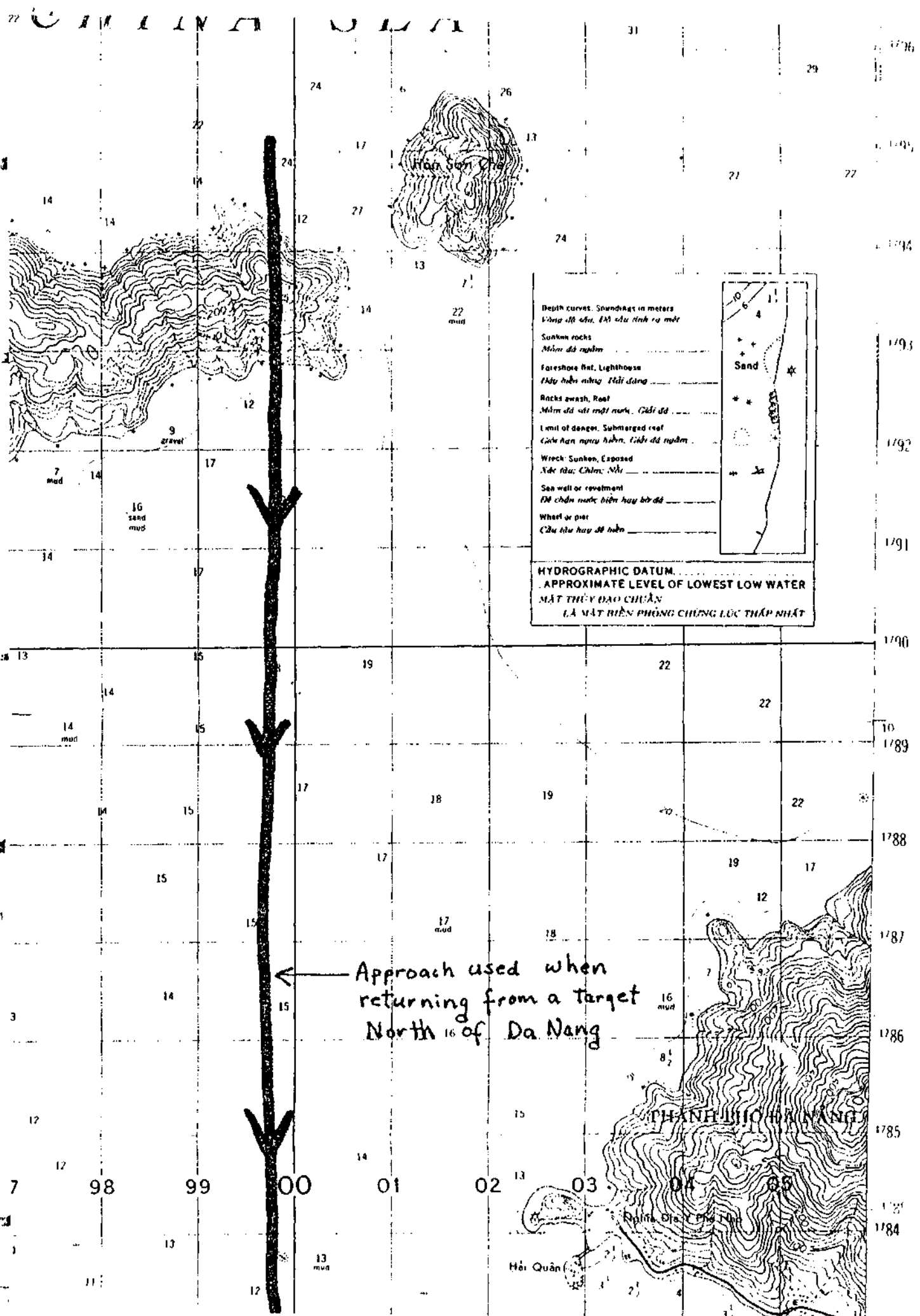
Herbicide chemical barrels are unquestionably a cause of much difficulty throughout the area.

Recommendations:

The group jointly arrived at the following recommendations:

1. Chemical barrels must be thoroughly cleaned before selling or giving to the local population. This to be taken up by Stickney with AFVN.
2. Agriculture personnel will work with Ranch Hand to determine critical areas. Relatively herbicide resistant crops will be recommended for planting in these areas. Demonstration plots will avoid these areas.
3. Ranch Hand will be provided a map showing important demonstration plots and crop areas to avoid.
4. Major Hidalgo will look into the spray equipment system to determine means to reduce leakage.





Depth curves. Soundings in meters
 Vũng độ sâu. Đường độ sâu tính ra mét

Sunken rocks
 Mìn đá ngầm

Foreshore Nat. Lighthouse
 Đèn biển ngoài. Hải đăng

Rocks awash, Reef
 Mìn đá nổi một nửa. Bãi đá

Limit of danger. Submerged reef
 Giới hạn nguy hiểm. Bãi đá ngầm

Wreck: Sunken, Exposed
 Xếp tàu; Chìm; Nổi

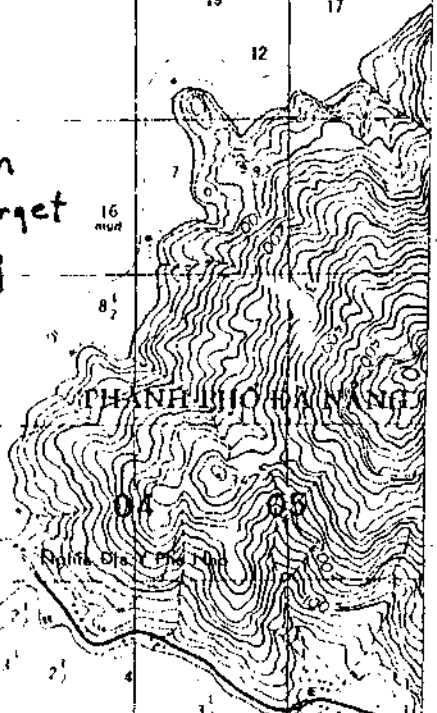
Sea wall or revetment
 Bức chắn nước biển hay bờ đá

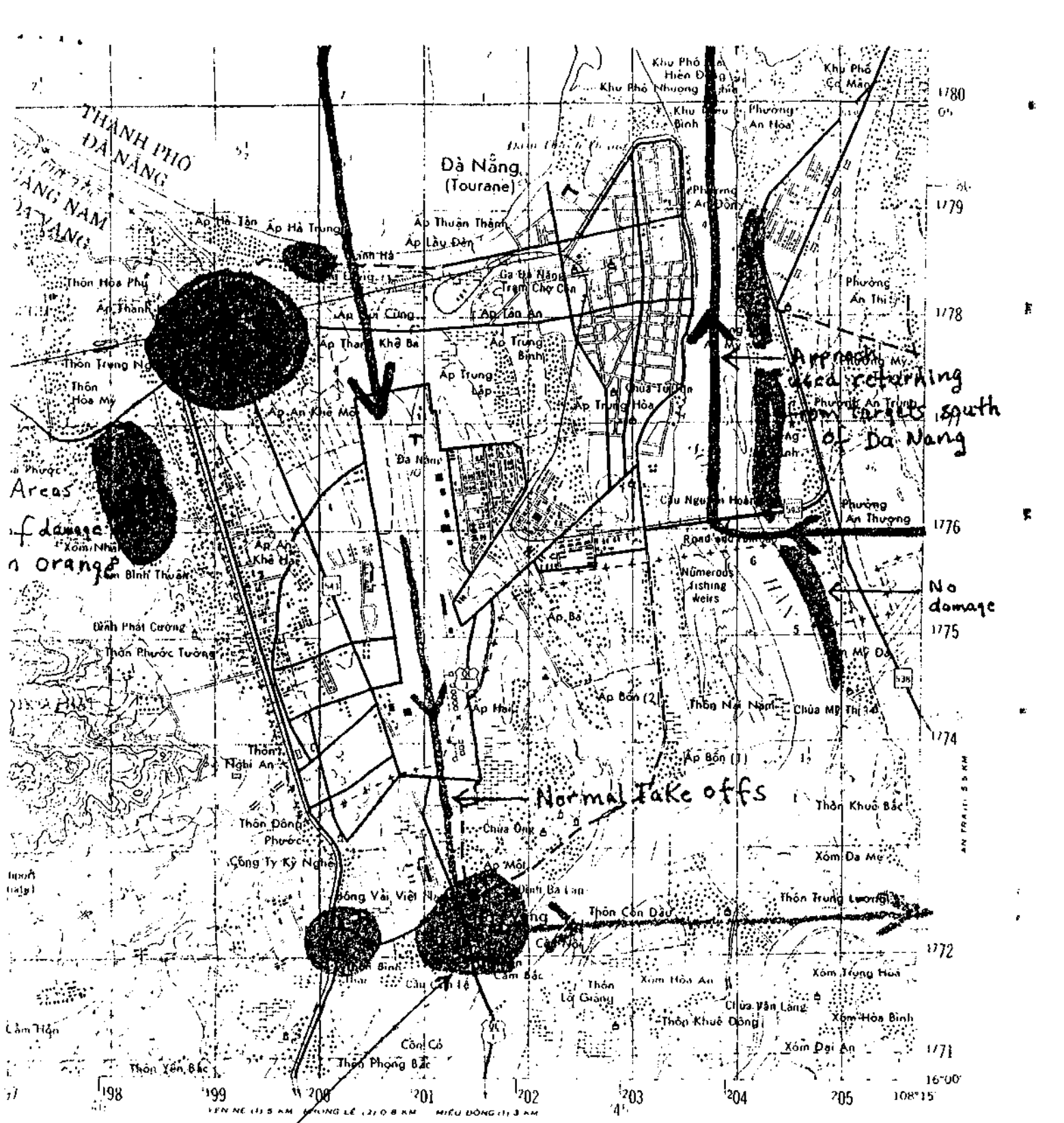
Wharf or pier
 Cầu tàu hay đê bến

HYDROGRAPHIC DATUM
 APPROXIMATE LEVEL OF LOWEST LOW WATER
 MẶT THUY DAO CHUẨN
 LÀ MẶT BIỂN PHÒNG CHỪNG LÚC THẤP NHẤT



← Approach used when returning from a target North 16° of Da Nang





Area of heaviest damage

ẢNH CAO ĐỘ: 20 MÉT
 ĐỘ PHÂN LƯNG 10 MÉT

EVERSI
 1:50,000 METER SCALE
 1:50,000 METER SCALE
 1:50,000 METER SCALE

ELEVATION GUIDE
 CHỈ DẪN CAO ĐỘ

BOUNDARIES
 GIỚI HẠN LƯU GIỚI

ADJOINING SHEETS
 BẢNG RÁP ĐỊA HỒ

