Top Secret

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DIRECTORATE OF
INTELLIGENCE

Industrial Facilities
(Non-Military)

Basic Imagery Interpretation Report

Lan-chou Petroleum Refinery

Lan-chou, China

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
Imagery Analysis Service

INSTALLATION OR ACTIVITY NAME		COUNTRY
Lan-chou Petroleum Refinery		CH
UTM COORDINATES	GEOGRAPHIC COORDINATES	WAC-PIC NO.
48SUQ780978	36-06-58N 103-38-16E	0383-3G

MAP REFERENCE
15th RTS. US Air Target Chart 200, Sheet 0383-22HL, 2nd edition, May 64, Scale 1:200,000

	NEGATION DATE (If required)
	Not Required

ABSTRACT

This report presents a detailed imagery-derived analysis of the Lan-chou Petroleum Refinery from September 1959 through August 1968.

The Lan-chou Petroleum Refinery was built with Soviet aid and became operational before the Soviet withdrawal in 1960. Since that time a lubricating oil plant, several unidentified processing units, and many additional storage facilities have been constructed. This refinery produces straight-run, cracked and blended gasolines, kerosene, diesel and fuel oils, lubricating oil, wax, asphaltic materials, and coke.

Included in this report are a detailed line drawing and a photograph of the refinery, mensuration of storage facilities, a discussion of physical features and operational functions, a construction chronology, and reference data.

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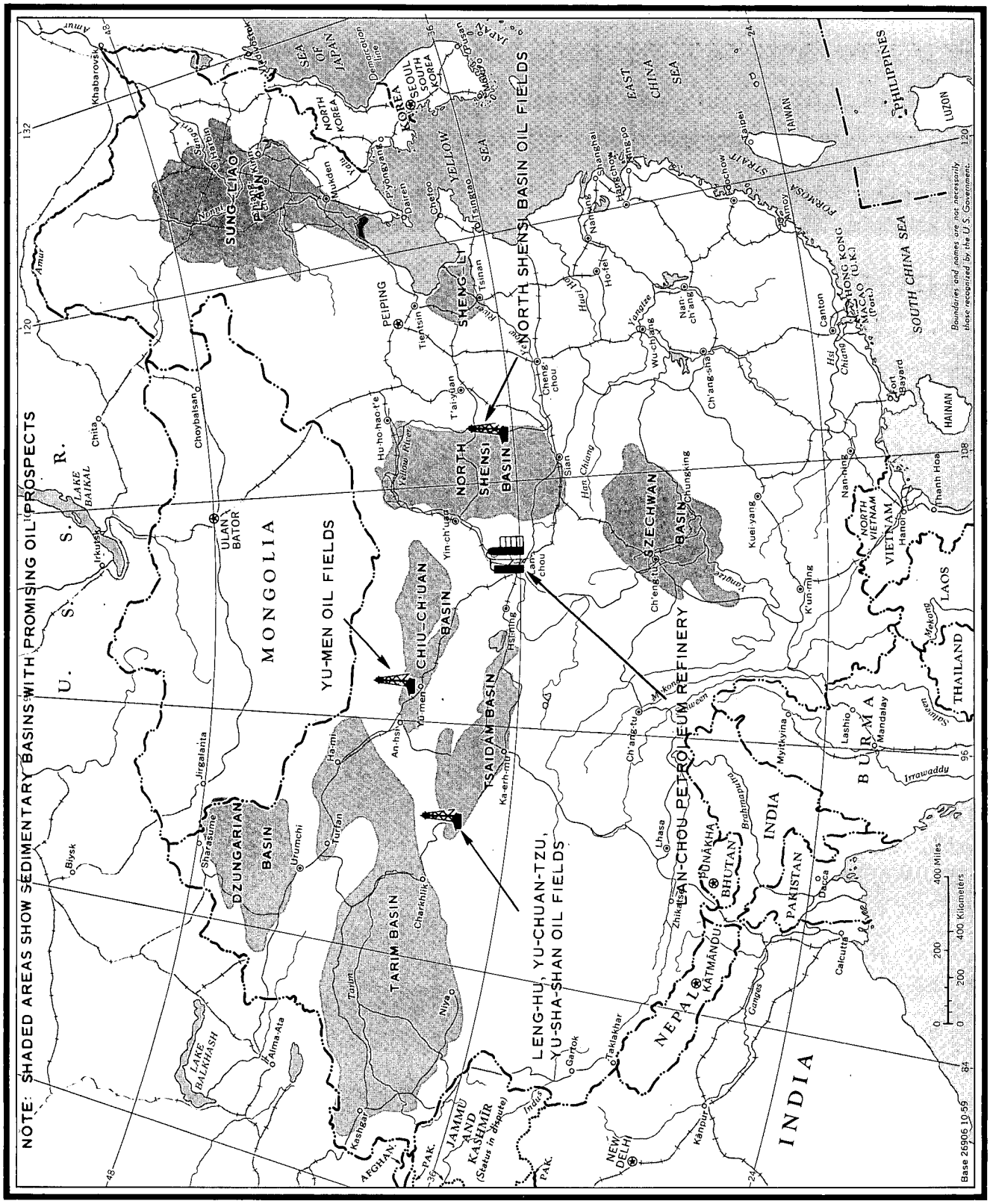

FIGURE 1. LOCATION MAP.

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INTRODUCTION

The Lan-chou Petroleum Refinery is located 9.5 nautical miles (nm) west-northwest of the center of Lan-chou on the south bank of the Huang Ho (Yellow River), in Kansu Province. The Lan-chou Chemical Fertilizer Plant [redacted] is located to the west of the refinery and the Lan-chou Petrochemical Complex to the northwest. The Lan-chou Thermal Power Plant (Hsi-ku) [redacted] is located to the northwest and is connected to the refinery by steam lines. The refinery is served by a spur from the Lan-chou to Hsiang-tang-chou rail line. Although the refinery is located on a river, shipments by water are probably very limited because there are no transfer facilities near the river and there is no well-defined river channel.

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The construction of the refinery began in April of 1956 with Soviet aid. Construction of the primary refining units was originally expected to be completed in 1961. However, at least limited production had begun by 1959. The major sources of crude oil are the Tsaidam, Chiu-chuan, and North Shensi Basins.1/

BASIC DESCRIPTION

Physical Features

The Lan-chou Petroleum Refinery, which is secured by a wall, measures approximately 8,800 by 3,700 feet and occupies about 750 acres.

Operational Functions

This refinery contains a large number of diverse processing units. It produces straight-run, cracked and blended gasolines, kerosene, diesel and fuel oils, lubricating oil, wax, asphaltic materials, and coke.

Status and Activity

September 1959 -- Most of the processing equipment including the catalytic and thermal cracking units, the three crude distillation units, and the light ends unit appeared to be complete and operational. The delayed coking unit was in the mid-stages of construction, the lubricating oil plant was in the early stages of construction, and tankage representing approximately 50 percent of the current crude and finished products storage capacity was in place.

June 1962 -- The delayed coking unit had been completed and construction was continuing at the lubricating oil plant and in the storage area. Construction was begun on an unidentified processing facility (Area A), and additions were made to the packing and shipping areas.

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September 1963 -- Most activity was centered in the possible steam plant, the unidentified processing facilities, and the administration and support areas (Areas A thru D) where construction was continuing. Additions were also made in the storage area and the lubricating oil plant.

October 1964 -- The possible steam plant (Area B) appeared complete and was connected by steam line to the completed unidentified processing facility (Area A) and to the main processing areas of the refinery. The lubricating oil plant appeared operational and an additional fractionating column and pipe furnace were added to one of the crude distillation units (Area L).

March 1966-August 1968 -- Only minor changes were made to the facilities during this time period. However, the small scale and poor quality of the coverage impeded a detailed analysis of the refinery.

On coverage of September 1959 the refinery was in operation as evidenced by heavy rail traffic at the shipping facilities and smoke from the multistage distillation unit (Area L). On all subsequent coverage there were several indicators of production activity at the refinery. The lubricating oil plant which was under construction in September 1959, was in operation when observed on coverage of October 1964. The delayed coking unit was operational when observed on coverage of June 1962.

Facilities and Equipment

The following table lists the functional areas and facilities within the refinery.

TABLE I

FACILITIES AND EQUIPMENT AT THE LAN-CHOU PETROLEUM REFINERY
(ITEMS KEYED TO FIGURE 3)

Area	Description	Equipment*
A	Unidentified Processing	4 U/I processing buildings 1 U/I processing equipment unit 1 pipe furnace 19 Storage/support buildings 34 Cylindrical storage tanks 2 diam. 25 ft. 24 diam. 20 ft. 8 diam. 15 ft. 11 Horizontal storage tanks 6 length 30 ft. 5 length 25 ft.

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Area	Description	Equipment*
B	Possible Steam Plant and U/I Processing	1 Possible steam plant 1 U/I processing equipment unit 1 Processing building 3 Storage/support buildings 2 Cylindrical storage tanks diam. 25 ft.
C	Administration and Support	2 Administration buildings 20 Storage/support buildings
D	Unidentified Processing	8 U/I processing buildings 21 Storage/support buildings
E	Crude Oil and Products Storage	23 Miscellaneous buildings 18 Horizontal tanks 6 length 40 ft. 12 length 35 ft. 8 Semiburied storage tanks 1 diam. 160 ft. 5 diam. 125 ft. 2 diam. 60 ft. 388 Cylindrical storage tanks 16 diam. 80 ft. 6 diam. 60 ft. 3 diam. 55 ft. 29 diam. 50 ft. 8 diam. 45 ft. 52 diam. 40 ft. 10 diam. 35 ft. 32 diam. 30 ft. 171 diam. 25 ft. 52 diam. 20 ft. 9 diam. 15 ft.
F	Water Basin	
G	Unidentified Processing	1 Row of at least 7 columns 1 Row of at least 4 columns At least 3 U/I processing equipment units At least 3 possible pipe furnaces 1 Compressor building 1 Possible compressor building 1 Control building At least 23 support buildings 2 Cylindrical storage tanks diam. 20 ft. 4 Possible cylindrical storage tanks, not measured

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Area	Description	Equipment*
H	Light Ends	2 Column groupings (3 columns each) 1 Compressor building 4 Processing buildings 2 Cylindrical storage tanks diam. 15 ft.
I	Moving Bed Catalytic Cracking	One area of processing equipment including reactor, regenerating kiln, catalyst hopper, and fractionator 1 Pipe furnace 7 Miscellaneous buildings
J	Thermal Cracking	1 Row of 7 columns 2 Pipe furnaces 2 Compressor buildings 1 Support building
K	Support	8 Support buildings
L	Crude Distillation	1 Multistage crude distillation unit with 8 Columns 1 Bank heat exchangers/accumulators 3 Pipe furnaces 1 Building with 7 desalting drums 1 Compressor building 1 Storage/support building
M	Crude Distillation	2 Distillation units each with 1 Line of columns 2 Banks of heat exchangers/accumulators 2 Pipe furnaces 1 Compressor building 2 Processing tanks diam. 10 ft.
N	Possible Treating	2 Processing buildings 10 Processing tanks diam. 10 ft. 14 Cylindrical storage tanks 8 diam. 20 ft. 6 diam. 10 ft.
O	Probable Dewaxing	2 Probable dewaxing units each with 1 Chilling and filter building with 6 attached treatment towers 2 U/I processing units each with 1 Processing building U/I processing equipment

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Area	Description	Equipment*
P	Unidentified Processing	1 Distillation unit with 1 Fractionating column 1 Pipe furnace 1 Compressor building 4 Cylindrical storage tanks diam. 25 ft. 3 Miscellaneous buildings 2 U/I processing units each with 1 Compressor/processing building Undetermined number of small processing tanks 4 Miscellaneous buildings
Q	Water and Products Storage	3 Cylindrical storage tanks diam. 25 ft. 3 Water storage basins 3 Horizontal storage tanks length 30 ft. 1 Support building
R	Products Storage Area	2 Storage/support buildings 6 Cylindrical storage tanks 1 diam. 80 ft. 5 diam. 25 ft. 36 Horizontal storage tanks 3 length 90 ft. 8 length 50 ft. 14 length 40 ft. 11 length 30 ft.
S	Distillation	2 Fractionating columns 1 Pipe furnace 1 Bank of heat exchangers/accumulators 1 Building with 4 probable desalting drums 5 Support buildings
T	Unidentified	1 Building with row of attached columns (number not determined) 18 Miscellaneous buildings
U	Lubricating Oil Plant	
	(1) Deasphalting Section	2 Banks processing equipment 1 Pipe furnace 1 Compressor building 5 Miscellaneous buildings 34 Cylindrical storage tanks

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Area	Description	Equipment*
		9 diam. 40 ft. 2 diam. 25 ft. 4 diam. 20 ft. 19 diam. 15 ft.
	(2) Solvent Removal Section	1 Cluster processing equipment 1 Pipe furnace 4 Miscellaneous buildings 22 Cylindrical storage tanks 7 diam. 25 ft. 15 diam. 15 ft.
	(3) Dewaxing Section	1 Chiller and filter building 2 Storage buildings 9 Cylindrical storage tanks diam. 20 ft.
	(4) Clay Treatment Section	1 Bank of processing equipment 1 Pipe furnace Undetermined number of processing drums/horizontal tanks 4 Miscellaneous buildings 29 Cylindrical storage tanks 2 diam. 25 ft. 27 diam. 15 ft.
V	Delayed Coking	1 Bank of coking drums 1 Fractionator 1 Bank of possible extractors 1 Pipe furnace 1 Compressor building 1 Shipping building with conveyor 16 Miscellaneous buildings 1 Cylindrical storage tank diam. 25 ft.
W	Water Treatment	3 Induced draft cooling towers 1 Possible cooling tower 7 Storage/support buildings 6 Water treatment basins 1 Pumphouse
X	Support	13 Support buildings
Y	Treatment, Blending, Packing, Storage and Shipping	Packaging building with 10 batch agitators/holding tanks 3 Banks processing equipment 1 Pipe furnace 28 Storage/support buildings

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Area	Description	Equipment*
		3 Cylindrical storage tanks 1 diam. 60 ft. 2 diam. 15 ft.
Z	Shipping and Storage	3 Loading racks serving 2 tracks each (not shown on graphic) 6 Control/support houses 1 Pumphouse 13 Storage/support buildings 4 Semiburied cylindrical storage tanks

*NOTE: All tank dimensions are approximate.

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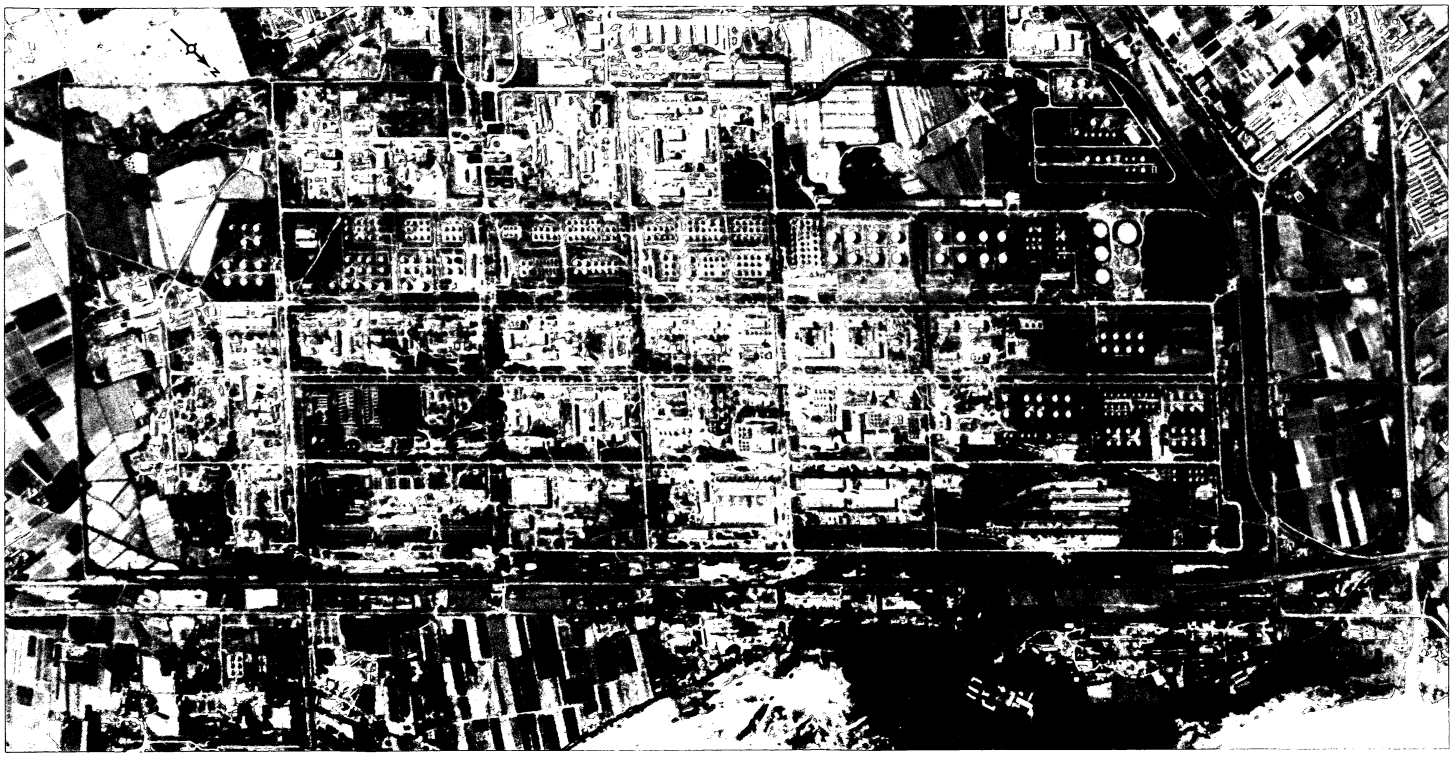

FIGURE 2. LAN-CHOU PETROLEUM REFINERY, 16 SEPTEMBER 1967, (MISSION KH-1101).

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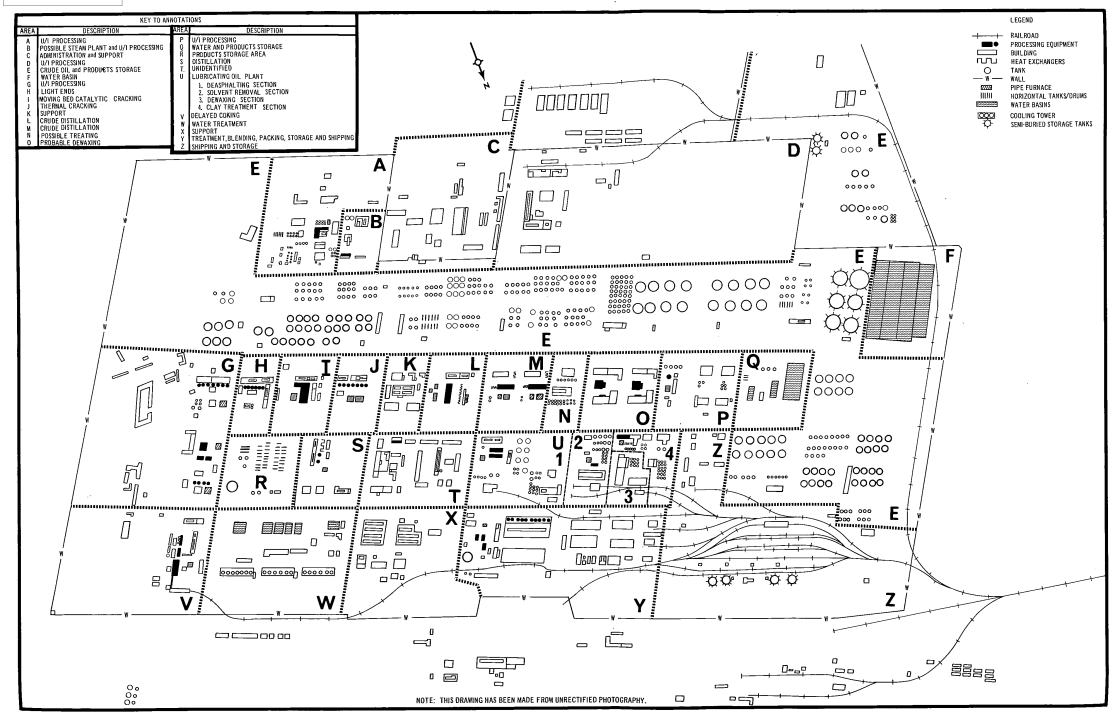

FIGURE 3. LAN-CHOU PETROLEUM REFINERY.

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REFERENCES

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Map

15th RTS. US Air Target Chart 200, Sheet 0383-22HL, 2nd edition, May 64, Scale 1:200,000 (SECRET/CONTROLLED DISSEM)

Document

1. DOD. [redacted] Lan Chou Refinery, January 1968 (CONFIDENTIAL) 25X1

Requirement

EXSUBCOM - BR-N/002-69

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