Top Secret

[redacted]

DIRECTORATE OF
INTELLIGENCE

Industrial Facilities
(Non-Military)

Basic Imagery Interpretation Report

Kremenchug Petroleum Refinery

Kremenchug, USSR

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RCS 13/0071/69

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IMAGERY ANALYSIS SERVICE RCS - I3/0071/69

INSTALLATION OR ACTIVITY NAME			COUNTRY	
Kremenchug Petroleum Refinery			UR	
UTM COORDINATES	GEOGRAPHIC COORDINATES	[redacted]	COMIREX NO.	WAC-PIC 25X1
36UWV316466	49-10-20N 033-26-40E		None	0233-35F

MAP REFERENCE

2nd RTS. USATC 200, Sheet M0233-20HL, 4th edition, Jun 66, Scale 1:200,000 (SECRET [redacted] 25X1

LATEST IMAGERY USED	NEGATION DATE (If required)
[redacted]	25X1

ABSTRACT

The Kremenchug Petroleum Refinery is one of the newer Soviet refineries being built in accordance with the standardized design which was reportedly accepted for use in 1959. Construction of the refinery support facilities was started late in 1961, and work on the components within the refinery began in 1962 or early 1963. The first indications that the refinery was in production were noted on photo coverage of August 1966. The primary distillation facilities now in operation indicate that the annual crude oil charge capacity of the refinery is approximately six million metric tons. The primary and secondary refining units in operation indicate that the refinery is presently producing straight-run and blended gasolines, various grades and blends of fuel oil, and probably light ends and asphaltic products. The large areas of active construction will possibly include lube oil and petrochemical plants.

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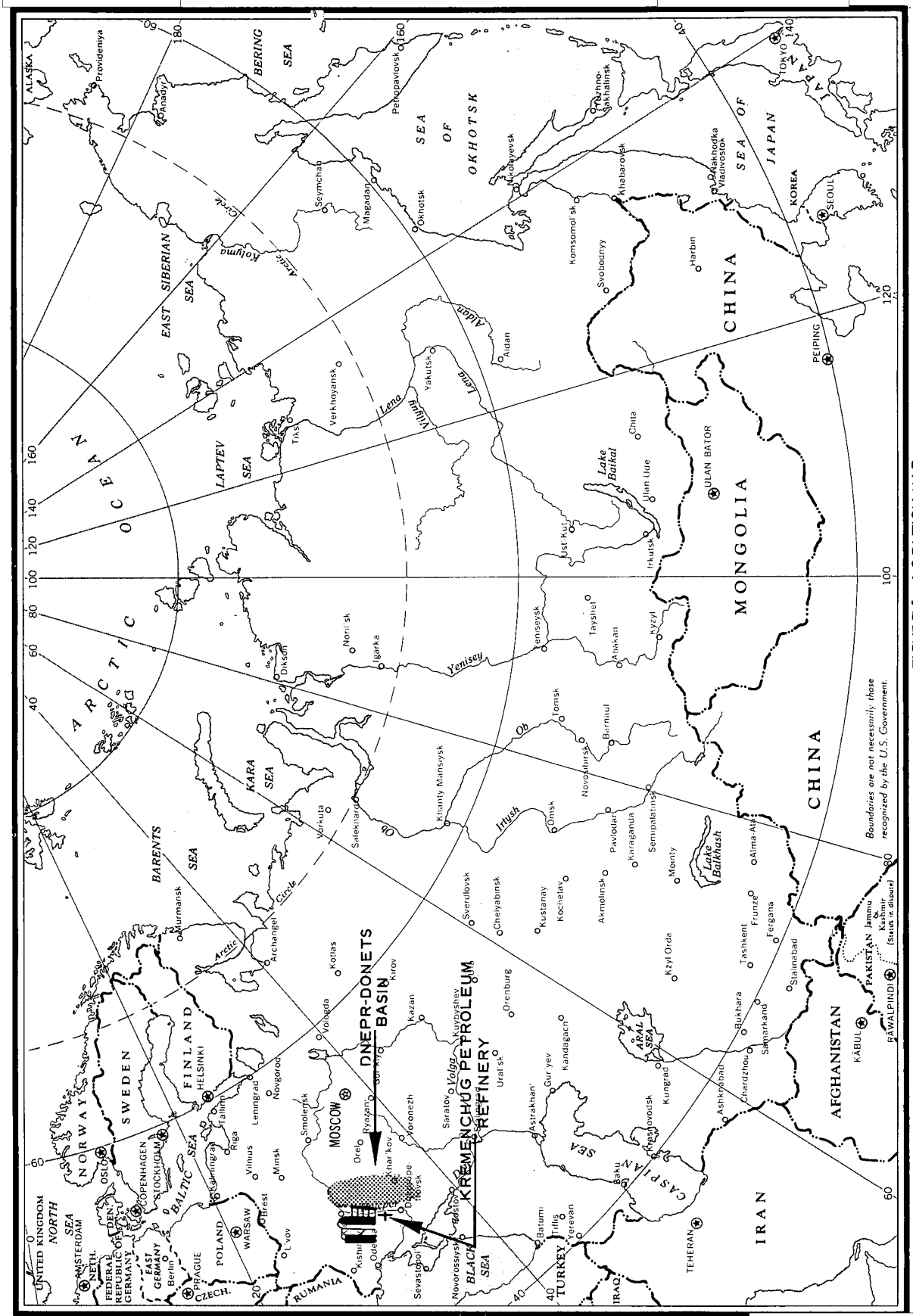

FIGURE 1. LOCATION MAP

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INTRODUCTION

The Kremenchug Petroleum Refinery is located approximately 5 nautical miles north-northeast of the center of Kremenchug. The primary and secondary refining units in the refinery appear to be complete, but a large percentage of the total area of the refinery complex is still very actively under construction. On completion, the areal extent of the fenced, integrated facilities will be approximately 1,100 acres. The maximum dimensions of the refinery are approximately 8,230 by 6,720 feet.

The refinery was situated at Kremenchug in order to process crude oil produced in the Ukraine, and more specifically in the Dnepr-Donets Basin region.2/ The crude oil is transported to the refinery by railroad and by a network of pipelines between Kremenchug and the various fields located in the basin.3/

Plants and facilities which are located adjacent to the refinery and are directly associated with it include a heat and thermal power plant (no BE listing), a water treatment plant (no BE listing), an unidentified chemical plant (no BE listing), and a concrete products and batch plant. The last installation is incorrectly identified in the Basic Encyclopedia as the Kremenchug U/I Installation

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BASIC DESCRIPTION

Status and Activity

The following is a generalized construction history of the refinery and associated facilities. No detailed chronological accounting of the construction of the various items of equipment or facilities is presented in this report; however, specific items are noted to illustrate significant points of development in the complex.

December 1961 - Survey of the refinery appeared to be completed as evidenced by faint tracings counter to the general agricultural pattern in the area. No construction activity was noted in the refinery area. Construction was in very early stages at the thermal power plant and the concrete products/construction support area. Road beds for the rail spurs into the complex were being constructed in the general direction of the refinery.

July 1963 - The concrete products/construction support area and the workers' housing area were nearly completed. Most of the earth work and several of the buildings at the thermal power plant were completed. In the

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refinery area, foundation excavations for the primary distillation units had been dug, and work had started on the main tank farms.

June 1964 - In the refinery area, the buildings and associated equipment for the primary distillation unit were in place, but the distillation columns had not been erected. The secondary refining units were in early stages of construction. Pipeline ditching was evident in several areas. The water treatment facilities were in the mid-stage of construction. Work was proceeding at a moderate rate on the thermal power plant, and construction on the nearby unidentified chemical plant had been started.

July 1965 - The major refining units were nearly completed, and the main steamlines and pipelines were in late stages of construction. The highest level of construction activity appeared to be in the storage and transfer areas. The thermal power plant was essentially complete except for the cooling towers. The associated chemical plant appeared to be completed.

August 1966 - The basic refinery was essentially complete and in operation as indicated by the burning of waste gases at the flare tower. The possible petrochemical and lube oil areas were in very early stages of construction with work proceeding at a relatively high rate. The water treatment plant was completed and in use.

November 1967 - No significant changes were noted in the basic refinery components. Construction in the possible petrochemical and lube oil areas was continuing at an accelerated rate, but identification of the components was not possible because of the early stage of construction and the small scale of the photography. The crude oil storage area was also being expanded.

March 1968 - Status of construction in the possible petrochemical and lube oil areas appeared to be at least in the mid-stage, and construction activity appeared to have decreased, probably due to winter conditions. The small scale of the photography precluded identification of the various items of refinery equipment.

Operational Functions

The date of the initial production at the Kremenchug Petroleum Refinery can be placed in a relatively narrow time frame. On photo coverage of [redacted] there were no indicators of production activity and on coverage of [redacted] the waste gas flare tower was in operation. On all missions subsequent to August 1966, atmospheric emissions, flares and rail car activity have been observed at the refinery.

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The placement of this refinery on-stream varied somewhat from the usual Soviet method, as deduced from photography. Generally, it has been observed that the refineries are placed into production as the various units are completed. At this refinery, it appeared that all of the basic units, including the primary and major secondary refining equipment, were completed before any indicators of operation were apparent. A distinct second phase of construction, which included the possible petrochemical and lube oil areas, was then begun at an accelerated rate which was continued at least through 1967.

Based on the identification of the equipment now complete and in operation, it can be assumed that the present products of the refinery include straight-run and blended gasolines, various grades of fuel oil, and probably blends of straight-run gasoline and fuel oil. Also, various light ends and asphaltic products are probably being made.

Physical Features

The following table lists the functional areas and facilities within the refinery. Also, a brief listing of the facilities at the heat and thermal power plant and the water treatment plant are presented because of the close association of these plants with the refinery. Precise identification of much of the refining equipment was not possible because of the small scale and/or quality of the imagery covering the complex. The tentative identifications of equipment are based on the overall aspect of the refinery, the relative positions of the units, and the generalized published listings of the standardized units to be found in the newer type Soviet refineries built since 1959. Approximate dimensions of the primary distillation columns are also presented in the following table.

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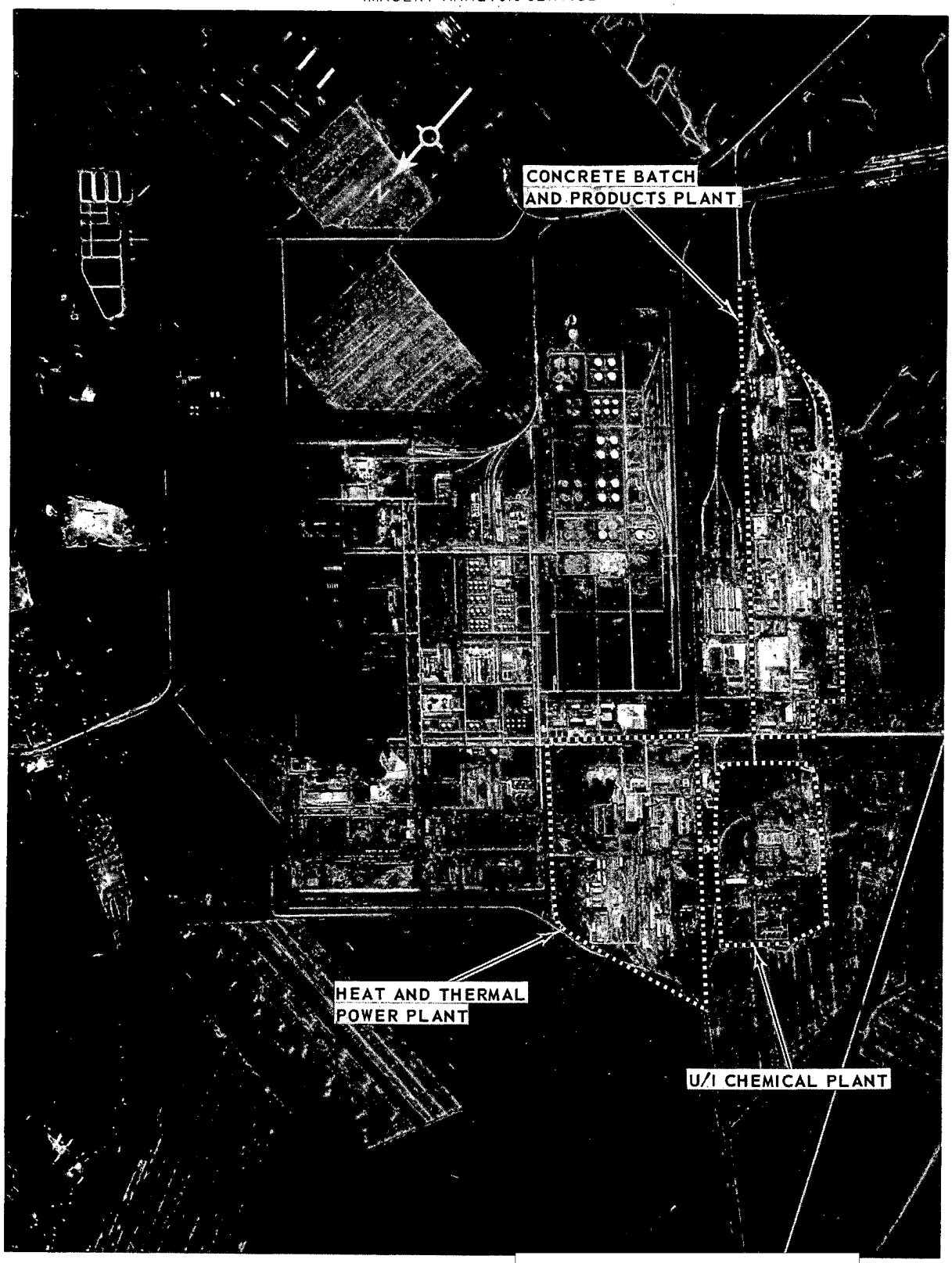

FIGURE 2. KREMENCHUG PETROLEUM REFINERY

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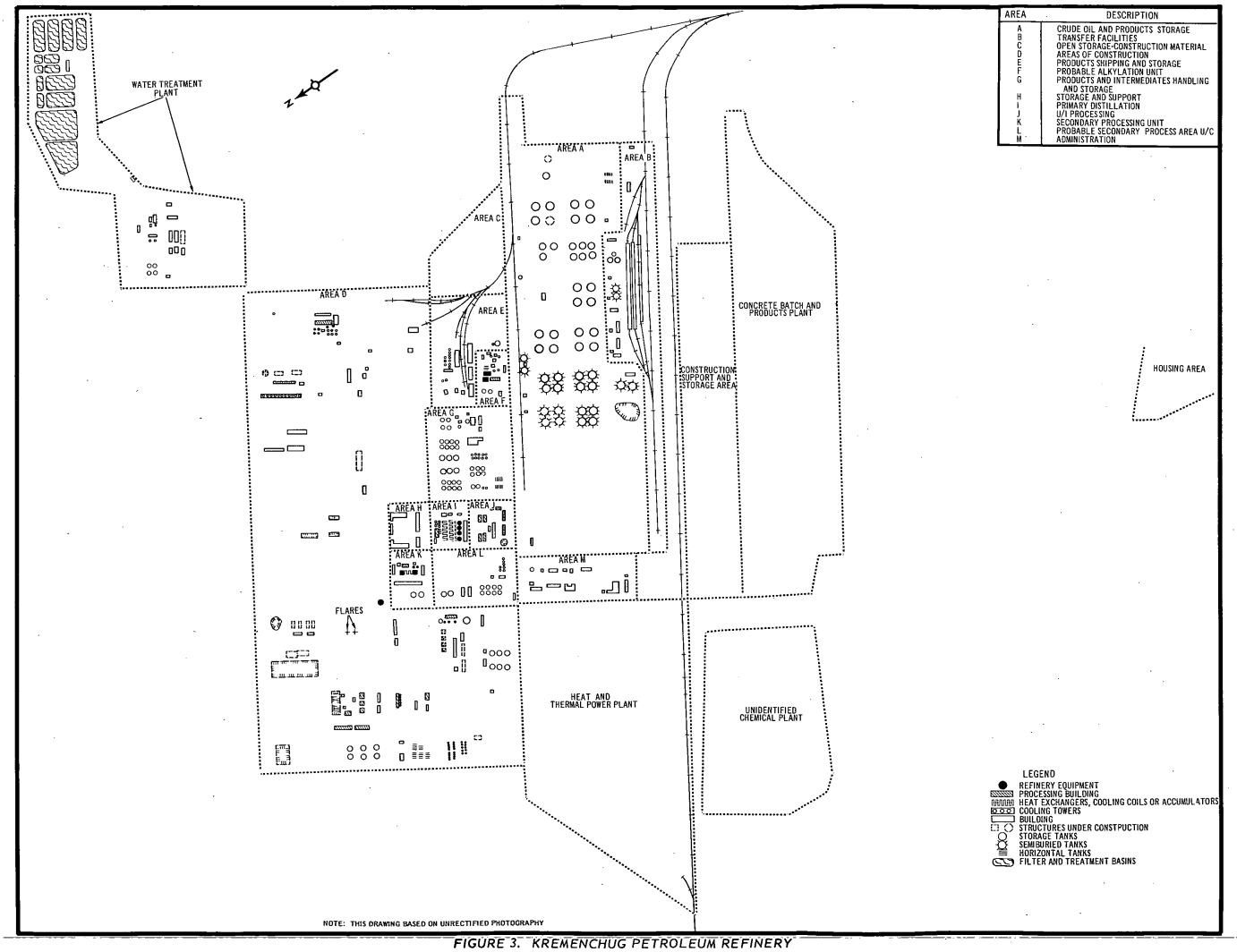

FIGURE 3. KREMENCHUG PETROLEUM REFINERY

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Table I

Equipment and Facilities at the
Kremenchug Refinery Complex
(Items are keyed to Figure 3)

Area	Functional Description	Equipment*
A	Crude Oil and Products Storage	19 cylindrical tanks, diam 110 ft (33m) 12 semiburied/mounded tanks, diam 130 ft (39m) 1 cylindrical tank U/C, diam 110 ft (33m) 6 semiburied tanks U/C, diam 130 ft (39m) 10 cylindrical tanks, diam 80 ft (24m) 2 semiburied tanks, diam 70 ft (21m) 1 cylindrical tank U/C, diam 80 ft (24m) 1 cylindrical tank, diam 50 ft (15m) 10 horizontal tanks, length 20 ft (6m) 7 support buildings 1 large excavation, probably for tanks
B	Transfer Facilities	3 loading racks each serving 2 tracks and 5 additional tracks continuing through the loading area 2 semiburied tanks, diam 80 ft (24m) 2 cylindrical tanks , diam 30 ft (9m) 1 cylindrical tank, diam 20 ft (6m) 11 storage and support buildings 2 possible medium tank bases/ basins

Area	Functional Description	Equipment*
C	Open Storage	Construction material
D	Areas of Construction (Possible Petrochemical and Lube Oil Plants)	1 tank/gasholder, diam 80 ft (24m) 11 cylindrical tanks, diam 50 ft (24m) 1 cylindrical tank, diam 40 ft (12m) 1 cylindrical tank, diam 35 ft (10.5m) 7 cylindrical tanks, diam 20 ft (6m) 25 horizontal tanks/treatment drums (not measured) 42 small columns/pieces of U/I equipment/tanks (not measured) 12 process buildings 34 storage and support buildings 1 cooling tower structure with 11 units 2 flare towers 19 buildings U/C 1 tank base U/C
E	Products Shipping and Storage	13 cylindrical tanks, diam 25 ft (7.5m) 1 possible tank/tank base, diam 60 ft (18m) 3 small U/I pieces of equipment 4 large storage buildings 3 support buildings
F	Probable Alkylation Unit	2 horizontal reactors 2 washing drums At least 5 towers/reactors/ scrubbers 1 process and compressor building with 3 tall, thin columns or vents 2 spherical tanks, diam 30 ft (9m) 3 horizontal tanks, length 80 ft (24m)

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Area	Functional Description	Equipment*
F	Probable Alkylation Unit (Continued)	2 cylindrical tanks, diam 35 ft (10.5m) 2 cylindrical tanks, diam 20 ft (6m) 2 small acid tanks (not measured) 7 support buildings
G	Products and Intermediates Handling and Storage	10 cylindrical tanks, diam 45 ft (13.5m) 9 cylindrical tanks, diam 40 ft (12m) 17 cylindrical tanks, diam 35 ft (10.5m) 10 cylindrical tanks, diam 25 ft (7.5m) 2 cylindrical tanks, diam 20 ft (6m) 10 horizontal tanks/treatment drums, length 50 ft (15m) 5 support and possible blending buildings 1 building U/C
H	Storage and Support Area	5 buildings Open storage area
I	Primary Distillation Area	1 primary distillation unit which contains 4 columns/ groups of columns -- 1 probable topping still 115' x 15' diam 2 vacuum stills [redacted] diam 2 atmospheric stills [redacted] 3 possible extraction columns for light ends [redacted] 3 banks of cooling coils, heat exchangers and accumulators 3 pipe furnaces 1 compressor and control building

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Area	Functional Description	Equipment*
I	Primary Distillation Area (Continued)	1 process building with 4 horizontal tanks/treatment drums (probably for desalinization) 1 support building 6 small cylindrical tanks (not measured)
J	U/I Processing Area U/C	4 building foundations/equipment units U/C 3 buildings 3 cooling tower structures with a total of 8 units 1 circular basin
K	Secondary Processing Unit	2 groups of columns (total of 5 columns) 1 process building with 4 attached columns/reactors/ vertical flash drums 2 small U/I peices of equipment/ tanks 2 small furnaces 1 bank heat exchangers 1 compressor building 2 control/process buildings 2 cylindrical tanks, diam 50 ft (15m)
L	Probable Secondary Processing Area U/C	4 buildings 2 cylindrical tanks, diam 50 ft (15m) 8 cylindrical tanks, diam 40 ft (12m) 2 cylindrical tanks, diam 35 ft (10.5m) 5 cylindrical tanks, diam 20 ft (6m)
M	Administration Area	13 buildings 1 water tower

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Area	Functional Description	Equipment*
Heat and Thermal Power Plant		Boilerhouse and generator hall Gas plant At least 35 buildings 4 small cylindrical storage tanks 3 small possible cylindrical storage tanks 8 small horizontal tanks 2 cooling towers
Water Treatment Plant		17 filter and treatment basins (3 outside of fenced area) 15 buildings 1 building U/C 6 chemical storage tanks

*Note: Measurements are only approximate because of indistinct outline of the distillation columns on available photography. Storage tanks were measured in meters and then rounded off to the nearest five foot dimension.

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REFERENCES

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Maps and Charts

2nd RTS. US Air Target Chart 200, Sheet M0233-20HL, 4th edition, Jun 66, Scale 1:200,000 (SECRET

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Documents

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2. SHAPE/SUPINTREP No. 110, R.R. No. 70796, Pipelines, May 65, (NATO SECRET)
3. CIA/R.R., ER 63-3, Atlas of Transmission Pipelines for Natural Gas, U.S.S.R., Mar 63 (UNCLASSIFIED)
4. CIA/PID/IB, P-269/64, [redacted] Search for a Petroleum Refinery at Kremenchug, U.S.S.R, Jun 64 (TOP SECRET RUFF)

Requirement

EXSUBCOM - BR-N/001-69

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