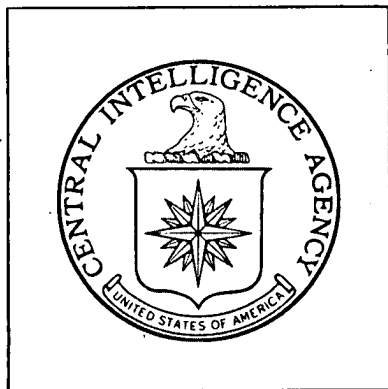


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**Industrial Facilities
(Non-Military)**

**DIRECTORATE OF
INTELLIGENCE**

Basic Imagery Interpretation Report

Fu-shun Shale Oil and Chemical Plant East

Fu-shun, China



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CENTRAL INTELLIGENCE AGENCY
 Directorate of Intelligence
 Imagery Analysis Service



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INSTALLATION OR ACTIVITY NAME		COUNTRY
Fu-shun Shale Oil and Chemical Plant East		CH
UTM COORDINATES	GEOGRAPHIC COORDINATES	WAC-PIC No
51TWG868318	41-50-01N 124-02-54E	0290-36-G
MAP REFERENCE		
USATC Series 200, Sheet M0290-11HL, 4th edition, Jan 66, Scale 1:200,000 (SECRET)		
LATEST IMAGERY USED		NEGATION DATE (If required)
		Not Required

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ABSTRACT

This report is a detailed description of the Fu-shun Shale Oil and Chemical Plant East. The basic production facilities at this plant were in operation and nearly complete when first observed on photography of [redacted]. A second phase of construction occurred during the June 1962-December 1965 period when the plant facilities were increased by approximately 40 percent. This increase resulted primarily from the construction of crude oil processing and storage facilities. Increased crude oil storage indicates that the raw material for the new plant facilities is obtained from oil field resources, possibly from Sa-erh-tu Oil Field in Heilungkiang Province, rather than from shale.

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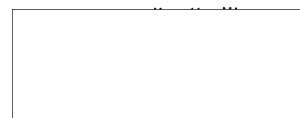
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Plant products include various blends of gasoline, fuel oil, and lubricating oil. By-products are ammonium sulfate and paraffin. The plant appeared to be in operation on all photography studied for the period from [redacted]. No significant changes in facilities have occurred since December 1965.

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This report includes a detailed line drawing and photograph of the installation, mensuration of significant features, a chronology of construction, a functional analysis, and reference data.

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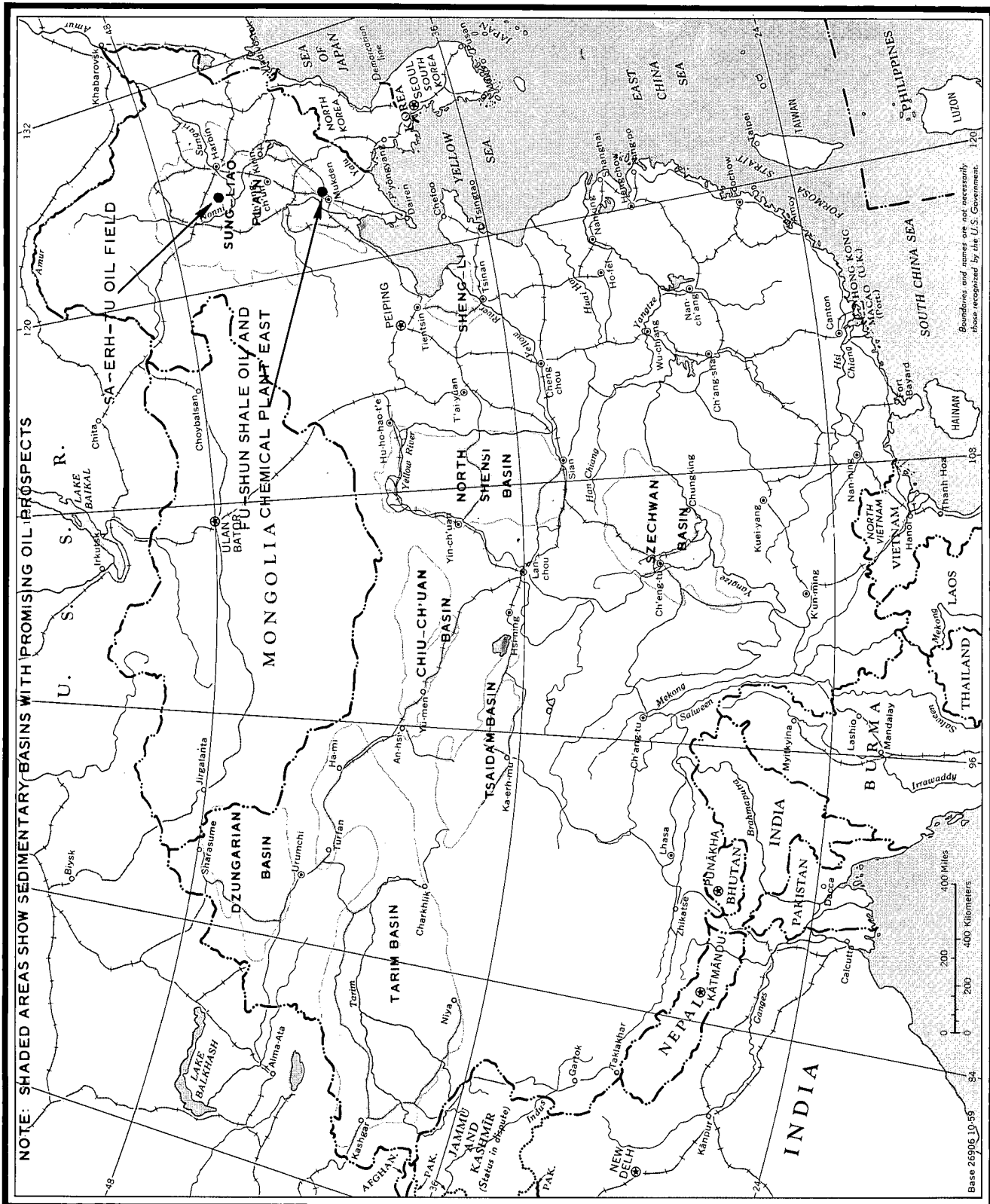


FIGURE 1. LOCATION MAP

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INTRODUCTION

The Fu-shun Shale Oil and Chemical Plant East, one of two shale oil plants in the Fu-shun complex, is located approximately 7 nautical miles (nm) east-southeast of the center of Fu-shun. It is well served by rail and road. The Fu-shun Shale Oil Plant West  is located 8 nm to the west-northwest of the plant. The Fu-shun Dam and Hydro Power Plant (Ta-huo-fang)  is located 4 nm to the north-northeast.

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The Fu-shun Shale Oil and Chemical Plant East processes shale brought in by rail from a large strip mine adjacent to the Fu-shun Shale Oil Plant West. The plant also processes crude oil, possibly from the Sa-erh-tu oilfield 200 nm north of Fu-shun in Heilungkiang Province.

BASIC DESCRIPTION

Physical Features

The plant is located in a narrow valley near the Hsiao-lin-chuang Ho (River). The plant facilities are situated in a 597-acre rectangular area measuring approximately 7,560 by 3,440 feet. The plant is expansive in design, especially when compared to the neighboring Fu-shun Shale Oil Plant West. No security precautions were observed at the plant.

Operational Functions

The plant extracts oil from shale and produces refined petroleum products from this shale oil and crude oil shipped in by rail. The primary refined products are various blends of gasoline, fuel oil, and lubricating oil. In addition, ammonium sulfate and paraffin are produced as by-products. Ammonia is obtained from the shale oil retorts and combined with sulfuric acid to form the ammonium sulfate.

Status and Activity

Construction of the facilities at the Fu-shun Shale Oil and Chemical Plant East occurred in two distinct phases. The basic facilities for the extraction of oil from shale and the production of refined petroleum products from this oil were complete when this plant was first observed in June 1962. In addition, most of the support facilities were present.

The second phase of construction was between June 1962 and December 1965 when the plant facilities were expanded by approximately 40 percent. The addition of processing units and facilities for crude oil storage and the dismantling of the vertical processing units from one shale oil retort area indicate that natural crude oil is being processed here. It is possible that this change occurred because the shale resources at Fu-shun are being depleted or because it is more economical to extract and process natural crude oil than oil shale.

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The plant appeared to be in operation on all photography studied for this report as evidenced by smoke, vapor, and dust from the stacks, burning at the flare tower, and railroad traffic.

The construction history of the plant is as follows:

June 1962 -- The original shale oil plant (Figure 3, Areas A through N, Q, V, and Y) was complete and operating. The second phase of construction was in a very early stage.

August 1962 -- Second phase construction was continuing. The construction of tank storage (Areas X and Z) was particularly apparent.

April 1963 -- Approximately 60 new cylindrical storage tanks (Areas X and Z) and one crude oil distillation unit (Area O) were complete.

December 1964 -- Approximately 36 new cylindrical storage tanks (Areas X and Z), one probable thermal cracking unit (Area P), one probable crude distillation unit (Area R), one probable catalytic cracking unit (Area S), and several new administrative buildings were complete.

December 1965 -- Two new unidentified processing units and 11 cylindrical tanks (Areas V and W) were complete. Most processing units were removed from the northernmost shale oil retort unit (Area B).

February 1966 to November 1968 -- No significant change in facilities observed.

Facilities and Equipment

The following table lists the functional areas and facilities within the plant. Precise identification of processing units was frequently impossible due to small scale of the imagery available, and occasionally is based upon relative positions of the units. Approximate dimensions of the storage tanks are also presented.

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TABLE I

Equipment and Facilities at the Fu-shun Shale Oil and Chemical Plant East
(Items are keyed to Figure 3)

<u>Area</u>	<u>Functional Description</u>	<u>Equipment</u>
A	Cooling Facilities	4 large spray ponds served by a pumphouse.
B	Shale Oil Retort	One large retort building, containing 3 complete and 1 incomplete shale oil extraction units. Each unit contains 20 retorts served by a tall exhaust stack. 3 vertical processing units 1 primary shale crushing building 1 secondary crushing building 1 screening building 1 ash bunker 2 control buildings 5 U/I buildings
C	Shale Oil Retort	One large retort building containing 3 complete shale oil extraction units. Each unit contains 20 retorts served by a tall exhaust stack. 15 vertical processing units 1 primary shale crushing building 1 secondary crushing building 1 screening building 1 ash bunker 3 control buildings 5 U/I buildings 2 large venturi cooling towers
D	Gas Processing Area (Light Ends)	16 vertical processing units 2 compressor buildings 1 bank of condensers/heat exchangers/cooling coils/accumulators 3 horizontal pressure tanks 2 cylindrical storage tanks (50 ft. diam.) 4 U/I buildings

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<u>Area</u>	<u>Functional Description</u>	<u>Equipment</u>
E	Thermal Power Plant	Plant is rail-served, with extensive coal-handling facilities, 2 large venturi cooling towers, a large exhaust stack, and switching yard
F	Sulfuric Acid Plant (Contact Process)	1 probable crushing and roasting building 1 probable oleum building 4 sulfuric acid tanks
G	Probable Clay Treatment Area (Lubricating Oil Refining)	3 U/I processing buildings 2 U/I buildings 6 cylindrical storage tanks (10 ft. diam.) 14 cylindrical storage tanks (20 ft. diam.) 1 induced-draft cooling tower
H	Ammonium Sulfate Plant	1 ammonium sulfate production building 1 large rail-served warehouse 2 U/I buildings 14 cylindrical tanks (25 ft. diam.)
I	Steam Plant	Boilerhouse with 3 stacks
J	Primary Distillation Unit	2 vertical processing units 2 pipe furnaces 1 compressor building 1 cylindrical tank (50 ft. diam.) 1 induced-draft cooling tower
K	Probable Thermal Reform Unit	1 vertical processing unit 1 pipe furnace 1 control building
L	Products Shipping and Storage	15 large warehouses 4 cylindrical tanks (50 ft. diam.) 6 cylindrical tanks (30 ft. diam.) 6 cylindrical tanks (10 ft. diam.)
M	Probable Delayed Coking Unit	2 fractionating towers Several covered coke drums 1 coking furnace 2 control houses 1 compressor building

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<u>Area</u>	<u>Functional Description</u>	<u>Equipment</u>	
N	Probable Dewaxing (Paraffin) Plant and Solvent Extraction Unit (Lubricating Oil Refining)	1 large vented dewaxing building 1 probable solvent extraction unit with 6 vertical processing units 1 generator building 4 cylindrical tanks (50 ft. diam.) 6 cylindrical tanks 9 cylindrical tanks 3 horizontal tanks 2 induced-draft cooling towers	25X1
O	Crude Oil Distillation Unit	3 fractionating columns 2 pipe furnaces 1 compressor building	
P	Probable Thermal Cracking Unit	2 fractionating columns 1 probable reactor 2 compressor/furnace buildings	
Q	Probable Deasphalting Unit (Lubricating Oil Refinery)	3 processing buildings with horizontal tanks 1 vertical processing unit 2 pipe furnaces 4 storage buildings	
R	Probable Crude Oil Distillation Unit	3 vertical processing units 2 pipe furnaces 1 compressor building 6 cylindrical tanks (20 ft. diam.)	
S	Probable Catalytic Cracking Unit	1 fractionating column 1 probable reactor 1 pipe furnace 1 control house 1 compressor building 2 cylindrical tanks (70 ft. diam.)	
T	Products Storage	8 large warehouses	
U	Support Area	13 buildings	
V	U/I Secondary Processing Unit	6 vertical processing units 1 pipe furnace 1 compressor building	
W	U/I Secondary Processing Unit	3 vertical processing units 1 compressor/furnace building 11 cylindrical tanks (30 ft. diam.) 3 U/I buildings	25X1

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FIGURE 2. FU-SHUN SHALE OIL AND CHEMICAL PLANT EAST,

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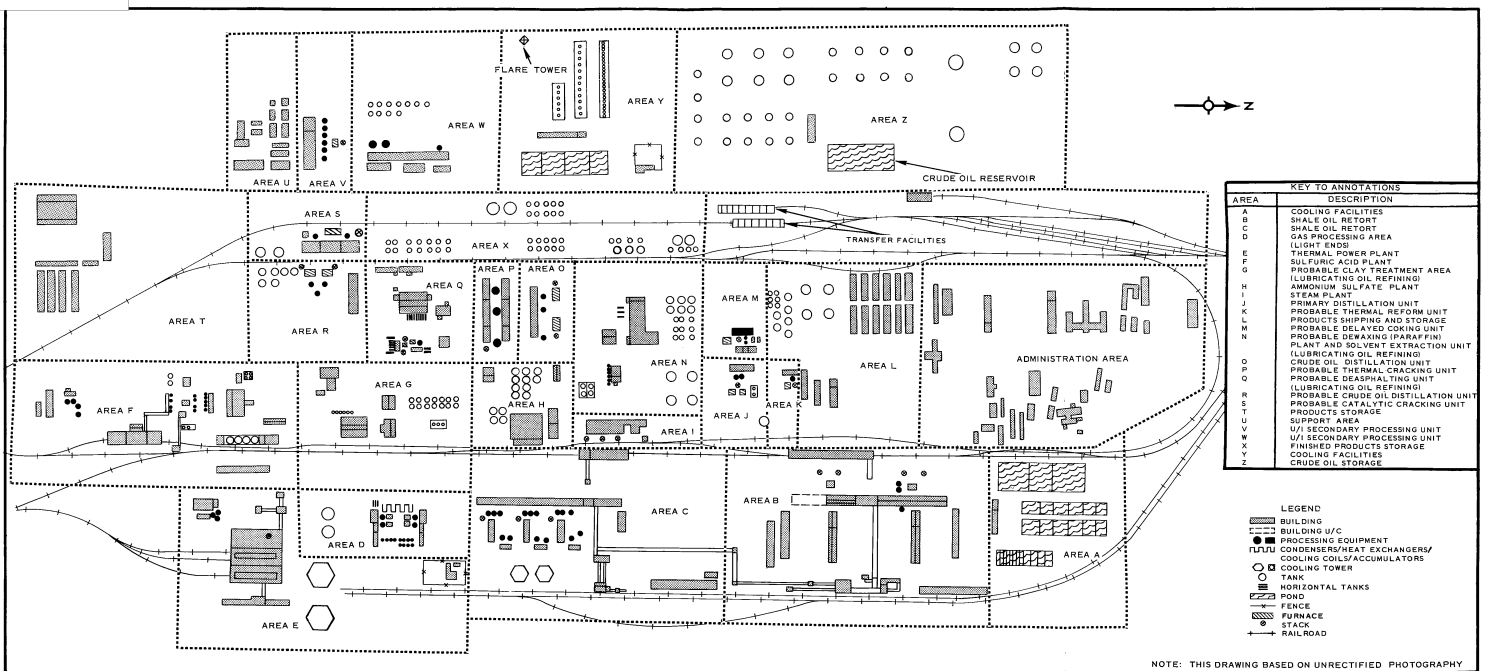


FIGURE 3.—FU—SHUN SHALE OIL AND CHEMICAL PLANT EAST.

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<u>Area</u>	<u>Functional Description</u>	<u>Equipment</u>
X	Finished Products Storage	2 cylindrical tanks (90 ft. diam.) 2 cylindrical tanks (50 ft. diam.) 3 cylindrical tanks (30 ft. diam.) 42 cylindrical tanks (20 ft. diam.)
Y	Cooling Facilities	3 large induced-draft cooling towers 1 large spray pond served by a pumphouse 1 electrical sub-station
Z	Crude Oil Storage	1 pumphouse 2 floating top cylindrical tanks (135 ft. diam.) 10 cylindrical tanks (65 ft. diam.) 20 cylindrical tanks (50 ft. diam.) 1 open reservoir (400 x 200 ft.)

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REFERENCES



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Maps



US Air Target Chart 200, Sheet M0290-11HL, 4th edition,
Jan 66. Scale 1:200,000 (SECRET)

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Documents



China-Industries, Fu-shun Shale Oil Plant East
(No. 2 Petroleum Refinery), April 1968 (SECRET)

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Documents - Continued

- 2. CIA. DDI/IAR 87005, Developments Relating to the Chinese Railroad System, September-December 1967 [redacted] (TOP SECRET RUFF) 25X1
- 3. CIA. 75011, Oil Field and Refinery Complex, Sa-erh-tu, China, July 1966 [redacted] (TOP SECRET RUFF) 25X1

Requirement

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