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SOURCE Research Report on Manganese Deposits in the Vicinity of Ching-lo Hsien, Shansi Province, Research Bureau, North China Development Company (F2B No 25841). Information requested.

REPORT ON MANGANESE DEPOSITS IN THE VICINITY OF HSI-MA-FANG-CHEU, CHING-LO HSIEN, SHANSI PROVINCE

1. Location and Accessibility

Hsi-ma-fang-chen is a small village 20 kilometers northwest of Ching-lo (38 23 N, 111 32 E). Hsien (38 23 N, 112 45 E), which is about 2,000 kilometers east of Ching-lo, on the T'ung-P'u Railway (Ta-t'ung -- P'u-chen Line) is the nearest railroad station. The road from the station to Ching-lo is steep and crooked, and is flooded after a rain. The road between Ching-lo and Hsi-ma-fang-chen is not steep, but becomes flooded after a rain.

Manganese deposits are found at Wen-ya-kou and Ta-li-kou, which are located 1 kilometer and 2 kilometers respectively west of Hsi-ma-fang-chen.

2. Geological Data

Ching-lo is in a small basin at the junction of the Fen Ho and Ma-fang-chen Ch'uan. The Ma-fang-chen Ch'uan flows southeast from the border of K'o-lan Hsien. In the vicinity of Hsi-ma-fang-chen, it crosses a small mountain range, where manganese deposits are found.

A large strike of reversed fault extends northeast - southwest passing through Hsi-ma-fang-chen. The southwestern section belongs to the Triassic Period of the Mesozoic Era, while the northeastern section belongs to the Sinian Series, which is composed of the following six seams in the order from the top:

- a. Spotted chlorite schist
- b. Phyllite and schistose sandstone
- c. Phyllite and sandstone
- d. Efflorescent sandstone (containing manganese deposits)
- e. Siliceous sandstone
- f. Grayish limestone, chlorite phyllite, and marl

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Outcrops are found in the areas east of the Ma-fang-chen Ch'uan. Generally speaking, the strike runs northeast and the dip is 20-40 degrees northwest.

The geological structure of the areas west of the river is similar to that of the areas east of the river, except that there are many faults. The strike generally runs northeast and the dip is 20-40 degrees northwest.

In the southeastern area, the strike generally runs 50 degrees north and the dip is 50 degrees northwest.

### 3. Deposits

Manganese deposits are found in the efflorescent sandstone seams. The thickness of the seams in Wen-ya-kou is about 40 centimeters and pebbles containing manganese are also found about one meter above the efflorescent sandstone seams. In the Ta-li-kou area, the thickness of the seams is about 60 centimeters.

### 4. Estimated Reserve

The estimated deposits of manganese are as follows (in metric tons):

<u>Locality</u>	<u>Liberal Estimate</u>	<u>Conservative Estimate</u>
Wen-ya-kou	6,800	5,200
Ta-li-kou	9,300	4,600
<b>Total</b>	<b>16,100</b>	<b>9,800</b>

### 5. Grade (in percent)

<u>Specimen</u>	<u>Mn</u>	<u>Fe</u>	<u>SiO<sub>2</sub></u>	<u>P</u>	<u>S</u>	<u>CaO</u>	<u>Sp Gr</u>
No 1	37.7	0.84	21.17	0.046	0.054	0.75	3.511
2	43.13	1.12	19.20	0.043	0.331	0.14	4.356
3	36.61	0.98	20.48	0.033	0.337	0.17	4.457
4	43.09	0.98	2.77	0.065	0.071	0.03	5.009
5	48.73	1.26	2.21	0.054	0.067	0.03	4.280
6	21.31	1.40	43.08	0.043	0.080	0.01	3.312

Source: Research Bureau, North China Development Company

The average manganese content is approximately 41 percent.

### 6. Present Status

According to the natives, manganese deposits in this area had been mined a long time ago, but there is no trace of abandoned mines. It is believed that deposits are also found at various places in the area between Ning-wu (28 59 N, 112 17 E) and Lan (38 17 N, 111 33 E), but because of the poor transportation facilities in this area, the deposits have not been investigated.

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