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EMIN

May 30, 1995

Charles H. Gehret
President

Admiral Zumwalt & Consultants, Inc.
Attn: Jim Zumwalt
1000 Wilson Blvd., Suite 3105
Arlington, VA 22209

Dear Jim:

Recently I met with the President of the North Korean Magnesite operations and his party in Zug, Switzerland. They were visiting at that time a company with whom we have had a long term association named Quintermina. Quintermina has been almost the exclusive seller in the export of Magnesite from North Korea to the free world (excluding, of course, the U.S.) for the last 20 years. They averaged somewhere between 150,000 to 200,000 tons per year. The balance of North Korea's production is either used internally or was previously bartered with Russia. The latter business no longer exists and total production has decreased from 1.2 million tons to current 0.3 million.

150-200 m
T/Y
magnesite

I reached the following conclusions as a result of these discussions:

1. The North Korean operation will not be a major factor in the world supply of Magnesite without substantial investment.
2. The Magnesite operation has no funds to use for working capital or investment. This, of course, applies to the government of North Korea, which, I assume, has major financial problems.
3. With a minimum of USD 20 million investment, which would include such things as building a new port facility, financing fuels, rehabilitating the kilns, etc., the North Korean Magnesite operations could be a world class operation and very competitive. This would represent a major source of foreign receipts (\$120,000,000 - \$200,000,000) since the operation is probably capable of producing and selling one to two million tons under this scenario.

20x10⁶ investment
↓
120-200 M \$/y
at 1-2x10⁶ \$/y

Obviously, the government of North Korea needs to make that financial commitment and I dare say they are not in position to do so. The Magnesite agency is appealing to us for financial assistance. This leads us to the following:

AMEPSOM
American Minerals, Inc.
AP Communications

Premier Refractories Canada, Ltd.
Premier Refractories and Chemicals, Inc.
Premier Services Corporation

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1. From our point of view, a minimum of a \$20 million investment would necessitate long term equity position on the deposit and operation and I assume any chance of this is out of the question considering the present political situation in North Korea and their present philosophy.
2. Would any government or world investment agency be willing to guarantee a loan in cooperation with the North Korean government provided the loan repayment was based on a commitment for the sale of substantial quantities of the production over a period of time? We are prepared to make the commitment for purchase of material. *sale commitment.*
3. If private enterprise would make the funds available, could they be guaranteed by the U.S. government or the World bank? *FG?*

This is the situation as we see it and obviously the questions I have raised are issues that need to be answered on a much higher level than simply the management of their Magnesite operations. It is very clear what needs to be done, either the North Korean government makes the investment with technical assistance from people such as ourselves or alternatively private enterprise supplies the capita (I doubt would do so without ownership or government loans and guaranteed in case the political situation goes awry). There is a problem as to whose laws or jurisdiction govern the project. I assume that they would be agreeable to work under an international judicial system, i.e., English law. *ref.*

In conclusion, it is a question of who is going to make the financial commitment. Without that, it is meaningless to meet with trade delegations as they have nothing to sell and that will only change with substantial new investment.

If you have any thoughts on the matter, please feel free to contact the writer.

Very truly yours,



C. H. Gehret
President

cc: Ralph Feuerring
John Gehret
Larry Lebauer
Stanley Weiss

**Proposal to Form Special Mining Area in
Danchon Region for Foreign Investment**

1. Special Mining Areas for Investment Projects are:

- 1) Komdok Mine (Zinc and Lead)
- 2) Sangnong Mine (Gold and Copper)
- 3) Hochon Mine (Gold and Copper)
- 4) Ryongyang Mine (Magnesia)
- 5) Daehung Mine (Magnesia)
- 6) Danchon Magnesia-Clinker Factory
- 7) Danchon Smeltery
- 8) Danchon Port

2. Purpose of Forming Special Mining Area

To substantially increase production of gold, silver, copper, lead, zinc, and magnesia-clinker which are abundantly deposited in the area. The increase can be made possible through foreign capital investment in the Danchon Mining Area. This special area will have advantageous investment incentives.

3. Program

In the 1st Stage, the most general data of the investment project shall be presented.

In the next Stage, foreign investors who are interested in the projects shall be allowed to investigate the area, conduct a feasibility study and negotiate terms of investment.

**Korea Joint Venture Group
Pyongyang, DPR of Korea
Tel: 850-2-3816040
Fax: 850-2-3814578**

Project Name: Komdok Zinc and Lead Mine

1. Name and General Information

1) Name: Komdok Mine

2) Location: Sao-Dong Danchon City, South Hamgyong Province, DPR of Korea
The point is latitude 40° 55' North and longitude 128° 41' East

Railway: Electric railway from Pyongyang to Daehung passes through mining compound.

Road: Class 2 road runs parallel with this railway.

3) Actual State

Development: Mine has been active for 50 years.

Estimated amount of deposits by survey:

Mineral	Quantity	Grade
Ore	236,000,000 MT	
Lead	2,667,000 MT	1.13%
Zinc	7,929,000 MT	3.36%
Silver	3,776 MT	16g/Ore MT
Cadium	21,240 MT	0.009%
Mercury	23,600 MT	0.01%

There are nine ore mining areas at present.

Supply of Electricity: Installed capacity of transformer mounted in substation of mine is 40,000 Kva and maximum road is 23,500 Kva.

Supply of Water: The quantity of water from the Namdae River which flows across the mining compound is more than 5,000 M³/hour which is sufficient.

4) Production Capacity of Mine and Products

Main products are concentrated ore of zinc and lead.

Grade of concentrated lead ore is 61%.

Grade of concentrated zinc ore is 51%.

Production capacity: 14,200,000 MT/year

1st ore dressing plant: 1,000,000 MT/year

2nd ore dressing plant: 3,200,000 MT/year

3rd ore dressing plant: 10,000,000 MT/year

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Actual Figure: 5,800,000 MT/year has been treated (Maximum)
Zinc: 167,000 MT/year
Lead: 55,700 MT/year

5) Sale of Products

Zinc concentrated ore is smelted in Danchon Smeltery. Lead concentrated ore is smelted in Munpyong Smeltery.

Railway distance to Danchon: 50km

Railway distance to Munpyong: 400km

2. Purpose of Foreign Investment

To increase return through decisive improvement of ore treating capacity and modernization of mining work through foreign capital investment for extraction equipment and other materials.

Project Name: Sangnong Gold Mine

1. Name and General Information

1) Name: Sangnong Mine

2) Location: Sangnong-section Hochon County, South Hamgyong Province, DPR of Korea

The point is latitude 40 16' North and longitude 128 East.
170m above sea level

Railway: There is electric railway access 1km for the mine.

Road: Class 2 road runs to Danchon City.

3) Actual State

Brief History: Ore body was discovered in 1940 and has been developed since 1957.

Estimated Amount of deposits by survey:

Mineral	Quantity	Grade
Ore	180,927,000 MT	
Gold	235.2 MT	1.3 g/MT
Copper	506,600 MT	0.28%

Estimated amount of deposits of Boron in Tourmaline:

Quantity of ore: 400,000,000 MT

Grade (B_2O_3): 2.3%

Content of Boron: (B_2O_3): 9,200,000 MT

Mining of ore: Mining has been done in ore bodies of Sinhung and Bonghwa and underground mining is in 5 pits at 200m level.

Supply of Electricity: Electricity of 3,300V is supplied from three substations in the mine compound directly connected to Hocongong No. 3 Water Power Station in mine area with power transmission line of 6MV.

Supply of Water: Water sources are Namdae River and Namsan River which are flowing through valley of mine area and are used as industrial water.

4) Production Capacity of Mine and Products

- a. Main products are gold and copper
- Grade of concentrated gold ore: 30-40 g/MT
- Grade of concentrated copper: 8-9%
- Grade of concentrated boron (B_2O_3): 8-9%

hydrothermal

b. Production capacity: 3,000,000 MT/year (capacity in plan)
1st ore dressing plant: 1,000,000 MT/year
2nd ore dressing plant: 2,000,000 MT/year

c. Actual production:

Maximum 1,302 million MT was treated in 1975, with the resultant production of 1,100 kg of gold and 2,800 MT of copper.

5) Composition of ore:

Cu: 0.2-0.3%

Zn: 0.005%

Pb: 0.001%

Au: 1-2 g/MT

Others include Mn, Ni, Co, Sb, As, Mo, Ag, etc.

6) Sale of products

Concentrated gold ore and copper ore are transported to Nampo Smeltery by railway.

Distance is 430 km.

G, Cu
→ f...
Nampo

Purpose of Foreign Investment

To substantially increase gold and copper production through the use of foreign capital investment for mining and dressing equipment and technology.

Project Name: Hochon Gold and Copper Mine

1. Name and General Information

1) Name: Hochon Mine

2) Location: Ryongwon Worker's District, Hochon County South, Hamgyong Province, DPR of Korea. It is 20km from Sangnong mine and 46km from Danchon City.

Railway and Road: It is connected to Danchon City by railway and Class 2 road.

3) Actual State

Brief History: Deposits were confirmed by survey in 1960 and development started in 1963.

Estimated Amount of Deposits by Survey:
400,000 MT of copper and 178 MT of gold in content.

Grade of ore:

Cu: 0.37%

Au: 1.4 g/MT

SiO₂: 42.16%

Fe₂O₃: 25.04%

Al₂O₃: 10.24%

Others include Ca, Mg, Ti, etc.

Ore extraction has been done in 13 pits and mining has been done from -200m to 55m.

2. Purpose of Foreign Investment

To substantially increase gold and copper production through foreign capital investment for mining and dressing equipment and technology.



Project Name: Ryongyang Magnesia Mine

1. Name and General Information

1) Name: Ryongyang Mine

2) Location: Paekgumsan-dong Danchon City, South Hamgyong Province, DPR of Korea

It is 46km away from Danchon City.

Railway and Road: It is connected to Danchon City by railway and Class 2 road.

3) Actual State

Brief History: Ore body was discovered in 1930. The mine was constructed in 1995 and production began in 1957. In 1981, ore mining was 2.86 million MT and production of magnesite was 2.016 million MT.

Estimated amount of deposits of ore: 4 billion MT

Chemical composition of ore:

MgO: 45.7%

SiO₂: 1.5%

CaO: 0.9%

Area is 13.5 Sq. km and five mines are being extracted at present.

All of magnesia ore is transported to Danchon Magnesia-Clinker factory, processed and exported.

Existing capacity of production is 1 million MT/year.

2. Purpose of Foreign Investment

To substantially increase magnesia production through foreign capital investment for mining equipment and technology.

*Danchon
Tanchon
in resp.*

*magnesite
mine*

Project Name: Daehung Magnesia Mine

1. Name and General Information

1) Name: Daehung Mine

2) Location: Daehung-dong Danchon City, South Hamgyong Province, DPR of Korea.
It is located 58km from Danchon City.

Railway and Road: It is connected to Danchon City by railway and Class 2 road.

3) Actual State

Brief History: Ore body was discovered in 1933 and production began in 1977.

Estimated amount of deposits by survey: 2.3 million MT.

Grade of ore:

MgO: 46.3%

SiO₂: 0.95%

CaO: 0.75%

4) Production Capacity of Mine

There are five mining areas. Most of the ore is transported to Danchon Magnesia-Clinker factory while some of it is processed in the mine's clinker factory. Current capacity is 150,000 MT/year. Annual production capacity of the mine is 800,000 MT.

2. Purpose of Foreign Investment

To substantially increase magnesia production through foreign capital investment for mining equipment and technology.

Project Name: Danchon Magnesia-Clinker Factory

1. Name and General Information

1) Name: Danchon Magnesia Clinker Factory

2) Location: Danchon City, South Hamgyong Province, DPR of Korea. It is located in Danchon City. This factory is located at Danchon port.

Railway and Road: It is connected by railway and Class 2 road.

3) Production Capacity of Factory

Actual State: 50m³ Vertical Furnace - 40 units
110m long Revolving Furnace - 2 units

Production Capacity: 1,000,000 MT/year

Vertical Furnaces: 600,000 MT/year (In case only coking coal is used)
850,000 MT/year (Heavy oil and coal are used together)

Revolving Furnaces: 150,000 MT/year

> using coal
> HFO / coal
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2. Purpose of Foreign Investment

To increase production of magnesia-clinker through foreign capital investment for heavy oil, coal and equipment.

3. Quality of Products

Description	MgO (%)	SiO ₂ (%)	CaO (%)
Coke Clinker	90-91	4-4.5	2
Heavy oil-combined clinker	91-92	3.8-4	2
Revolving furnace clinker	93-94	2.5	2
High-grade clinker	96-98	0.5	1

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HFO → magnesia

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Project Name: Danchon Smeltery

1. Name and General Information

1) Name: Danchon Smeltery

2) Location: Danchon City, South Hamgyong Province, DPR of Korea. It is located on the outskirts of Danchon City.

3) Actual State

Brief History: Factory was constructed in 1982. Trial production began in April 1984, and full operations started from January of 1985 at present capacity.

Production Items and Capacity of Factory:

a. Items: Electric zinc, concentrated sulfuric acid and cadium

b. Capacity: Electric Zinc (Purity of Zn: 99.5%) 100,000 MT/year
Sulphuric Acid (Concentration over 95%) 140,000 MT/year
Cadium: 280 MT/year

c. Supply condition of electricity and water

Necessary electricity is supplied to the factory as 6.6mV high-voltage transmission line is directly connected from Hochong-gang Hydroelectric Station to this factory. Factory uses water from the Namdae-chon River which flows by the side of the factory.

hydro electricity

3) Sale of Products

a. Domestic Market

Electric Zinc of 2,700 MT/year and sulfuric acid of all quantity has been sold in the domestic market for the last 10 years.

b. Overseas Market

This factory has exported electric zinc of 45,000 MT/year for the last 10 years.

2. Purpose of Foreign Investment

To modernize production process and increase actual extraction rate of zinc smelting to more than 95% and sulfuric acid to more than 80%.

Project Name: Danchon Port Construction

1. Name and General Information

1) Name: Danchon Port

2) Location: Danchon City, South Hamgyong Province, DPR of Korea. It is located at latitude 42° 24'30"N and longitude 138° 55'30"E. It is 4km away from Danchon City and 3km away from the estuary of the Namdae River.

3) General Information

Brief History: Japan worked on constructing this port from 1938 to 1945 for the purpose of transporting ore deposited in the Danchon region, but construction was stopped by its defeat in World War II. The port was destroyed in the Korean War from 1950-1953. At present, there are fishery enterprises and a ship repairing factory in the port area.

Advantage of Port Construction

- a. Large size ships could enter. Coast is smooth and shore is deep.
- b. Tide difference of sea water in port area is only 20cm.
- c. Area of its construction is made of sand stratum. Sea shore is 25m, depth of water is 5m and bottom of sea is 17m in depth.
- d. Main wind is northwestern but it is also affected by eastern and southeastern winds.
- e. The area is in good condition and there is a proposed site to manufacture prefabricated concrete elements (500,000m³) of box type and stony mountain within 1km west and concrete elements (2,000,000m³) of stony mountain within 4km south.

Weather Conditions

- a. Annual average temperature: 8.78° C
Average Winter temperature: -2.83° C (The water never freezes)
Average Summer temperature: 19.7° C
- b. According to wave survey data, the frequency of waves in the southwestern direction is large and the maximum height of waves is 3.2m in the southeastern direction.
- c. Average rainfall in the area is 620mm/year.

4) Economic Value of a Developed Port

- a. 10 billion tons of magnesia ore deposited in Danchon region could be exported through this port after treatment in Danchon Magnesia-Clinker factory which is 1km from the port.

b. 480,000 tons of coke and 140,000 tons of heavy oil could be imported through the port as we plan to export 2 million tons of magnesia-clinker each year.

c. Lead and zinc ore of about 300 million tons deposited in the Danchon region could be processed in the Danchon Smeltery which is 0.5km away from the port. More than 100,000 tons of zinc produced in its smeltery could be exported and more than 300,000 tons of concentrated zinc ore could be transported to the smelteries in Wonsan and Nampo.

d. Quantity of freight goods in this port is anticipated to be over 3 million tons/year.

2. Purpose of Foreign Investment

To construct a port to allow 20,000 MT vessels to enter and to gradually develop the port to accommodate 100,000 MT ships.

Project Name: Unsan Gold Mine

1. Name and General Information

1) Name: Unsan Mine

2) Location: Pukjin Worker's District, Unsan County North, Pyongyang Province, DPR of Korea. Mine is located 40km away from Hyangsan station of Hyangsan County.

Railway and Road: Mine was connected by railway to Hyangsan station, but the link was destroyed by flood in 1995. Class 2 road connects to Hyangsan County.

3) Actual State

Brief History: Japan had developed two large ore deposits as long ago as 1910. The mine was abandoned in 1973 and developed again in 1977 when a plant with 30,000 MT/year capacity was constructed. In 1981, 50,000 MT of ore (grade: Au 3.1g/ore MT) was extracted and 183kg of gold was produced.

Estimated amount of deposits by survey: Survey on this area has not been conducted in detail but, at present, estimated amount of gold deposits is about 50 MT.

Grade of ore: Gold 5g/ore MT
Silver 25g/ore MT

2. Purpose of Foreign Investment

To develop gold mines in the Unsan area on a wide scale, involving foreign capital investment for updated surveying and mining and dressing equipment and materials.

read like

Gold base
to PY.

= new
mine
area
??

Project Name: Hyesan Copper Mine

1. Name and General Information

1) Name: Hyesan Mine

2) Location: Masan-doug Hyesan City, Ryanggang Province, DPR of Korea. Point is latitude 41° N and longitude 128° E.

Railway and Road: Mine is connected by electric railway to Pyongyang-Hyesan and a Class I road runs parallel with this railway.

3) Actual State

It was first developed in 1967.

Estimated amount of deposits by survey:

a. Quantity of ore: 15,751 million MT

Grade: 1.09%

Content: 172,000 MT

b. Quantity of lead and zinc ore: 3.743 million MT

Grade of lead: 1.2%

Content of lead: 420,000 MT

Grade of zinc: 2.5%

Content of zinc: 96,000 MT

c. Ore is mined in two underground areas.

Supply of electricity

Current installed capacity is 29,800Kw but the average electricity required is 6,800Kw and capacity of the substation is 17,600KvA. 66,000V power transmission line is linked to the substation.

Supply of water

More pumps and stations are needed to increase supply of industrial water for the dressing plant (when treating 1 million MT).

4) Production Capacity of Mine and Products

a. Main products are concentrated copper ore and some concentrated lead and zinc.

b. Production capacity is 1 million MT of copper and 100,000 MT of lead and zinc ore.

c. Actual figure of production: Copper ore - 500,000 MT/year
" Copper - 4,600 MT/year

electric
rail +
road.

interesting

5) Composition of ore:

Cu: 0.3-1.1%

Pb: 1.2-1.8%

Zn: 2-2.8%

B: 0.01-0.06%

Co: 0.003%

Ag: 1-3g/MT

Ni: 0.001-0.003%

Mo: 0.05%

6) Sale of Products

Concentrated copper ore is transported to Nampo Smeltery (800km) by railway where it is smelted.

2. Purpose of Foreign Investment

To substantially increase ore production through the use of modern mining equipment and materials.

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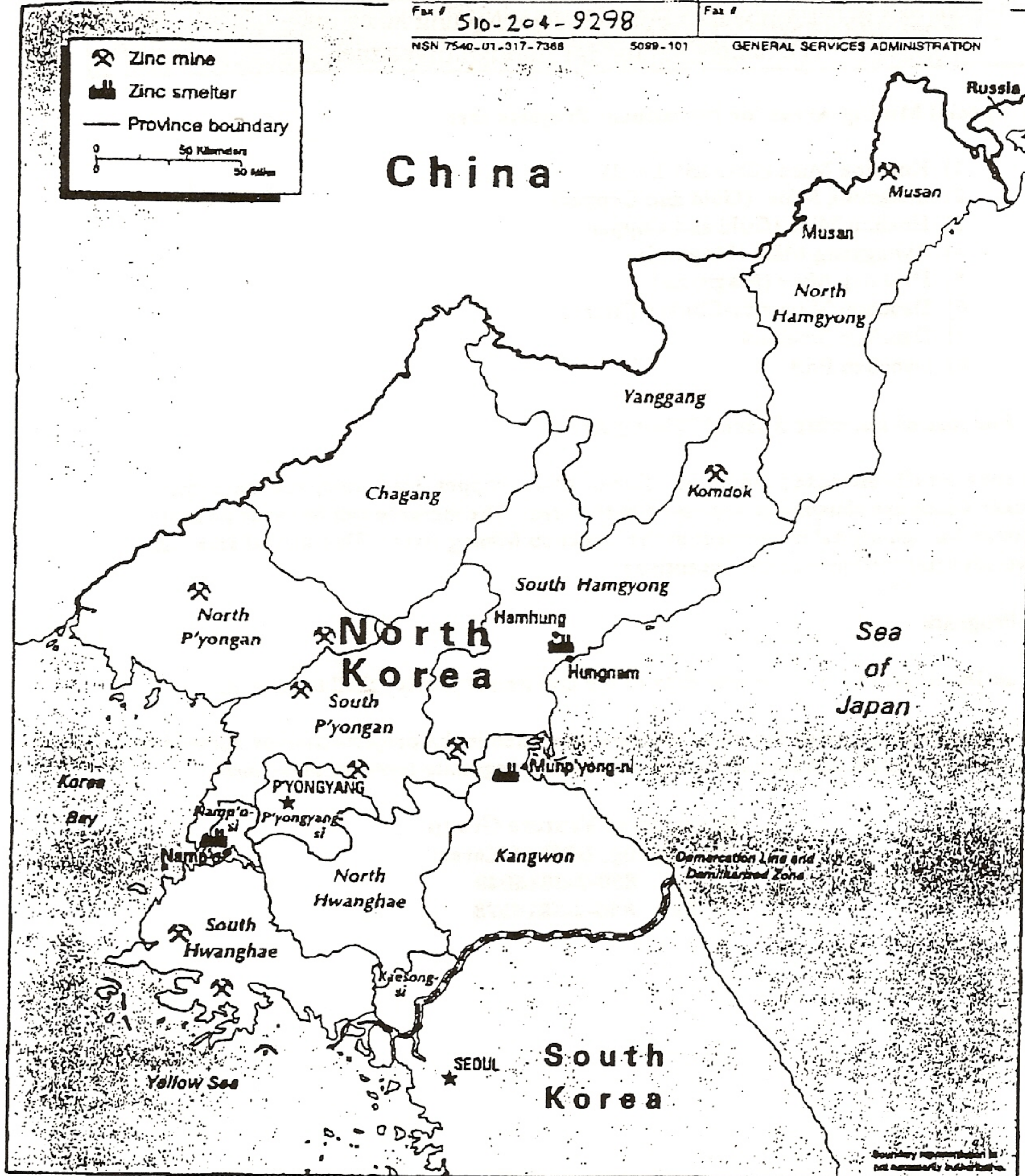
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**Figure 2
North Korean Zinc Industry**



*Can't
find
Mup'ong-ni
mine!*

Unclassified

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