

MAR 19550001: CLEAR HILLS

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901 - 8th Avenue West
Calgary, Alberta

January 21st, 1955

Dr. N. H. Grace, Director
Research Council of Alberta
Edmonton, Alberta

FE-AF-001(03)

Dear Sir:

Summary - The exploration that has been done by the Syndicate which financed the operations on Iron Prospecting Permits Nos. 1, 2, and 4, has proven the existence of an extensive iron deposit. The deposit however is low grade (35% Fe) with a high silica content. The major problem is one of economics but if a process can be developed using the abundant natural gas in the area to produce pig iron near the site of the deposit then the possibility exists of producing this commodity cheaper than anywhere else on the North American continent. In this event the adverse factors such as distance from large markets, etc. are nullified.

General - I have attempted in the following letter to give you a comprehensive statement of the stage at which our investigations are being terminated. If you have further questions or wish further elucidation on any point please do not hesitate to request it. If I can be of assistance in any investigations the Research Council may conduct I will be most pleased to do what I can.

The major portion of the work done in the Clear Hills area on and around Iron Prospecting Permits Nos. 1, 2, and 4, is discussed in the "Preliminary Report on the Peace River Iron Ore" and the "Geological Report - Clear Hills District - Peace River, Alberta", copies of which you have received.

Additional information has been collected and is discussed below. As will be seen the investigations to date have been of a preliminary (or exploratory) nature. The preliminary stage may be said to be completed and the next stage of the investigation involving metallurgical tests, market analysis, etc., remains to be done.

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Topographical Mapping - Topographical maps have been prepared on all three permits. These maps and accompanying letters from Blanchett, Trorey, and Associates, who did the work on Permits No. 4 and No. 2, are herewith submitted. The work on Permit No. 1 was done under the supervision of Seismic Ventures Limited. The accuracy of the work on this permit would be well within 50 feet as elevation control from seismic work was available.

These maps will be a valuable guide as to where the deposit might occur near the surface and will help outline the eastern extent of the deposit.

Metallurgy - A sample of the cores weighing about 50 pounds was sent to the Division of Mineral Dressing and Process Metallurgy in Ottawa for testing. The reports on this are enclosed. As you can see the results were rather discouraging. On the other hand what was tried were standard approaches to the problem. The tests were far from complete and Ottawa has expressed willingness to continue further testing.

Several processes for smelting or treating deposits such as this have been suggested by various people:

1. The Swedish have been experimenting with a process using gas. Unfortunately I have no further particulars on this.

2. Dr. Wm. Armstrong of the University of British Columbia has suggested the Krupp-Renn process which apparently is a process for treating ores not too dissimilar to the Peace River deposit.

3. The Kaiser organization has acquired a European steel making process that uses oxygen and is called the Brassert Oxygen Process and is apparently used successfully in treating low-grade European ores. A plant to use this process is under construction in Ontario.

It appears therefore that a process may exist for treating deposits similar to the Peace River deposit. Further, as natural gas is so readily available, a treatment may be found that would smelt or refine the ore near the mine site by utilizing this natural gas and if so, pig iron could probably be produced cheaper here than anywhere else on the North American continent.

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Prime importance should be given to investigations and development of such a process which would use natural gas under reducing conditions to turn out pig iron at the site of the deposit.

Conclusions - While the syndicate which financed the operations has been forced to conclude the deposit is not economical at this time, yet I cannot but feel that at some time in the not too distant future this deposit will be a most valuable asset to the Province of Alberta. In order to advance this possibility the following recommendations are respectfully suggested.

Recommendations - 1. The obtaining of a bulk sample from the outcrop described in the Geological Report.

A geologist, a shooter, a small drill, dynamite and truck would be needed. In early winter when the ground is frozen and before the snow is deep a truck can drive within about two miles of the outcrop. The cost of this operation should not exceed \$2,500.00.

2. Further metallurgical tests should be made. This can be done by the National Research Council or your own facilities might be preferred. Any process currently used in treating similar ores should be closely investigated. If any process using natural gas is in existence or any research is being done along this line then this investigation should receive prime priority. Thought might be given to the possibility of the Research Council perfecting such a process.

3. Topographic mapping should be continued east of the present permits as undoubtedly the deposit extends farther in this direction.

4. A surface geological survey should be made along the eastern edge of the Clear Hills between the Notikewin River and the base of Township 85 at an elevation where an outcrop of the iron formation could be expected. The cost of this limited work would not exceed \$1,500.00. The geologic age of the formation and its correlative position in the stratigraphic section should be determined.

5. The oil exploration in the area should be watched - if deep bore holes or shot holes for seismic exploration or core holes are being drilled, a representative of the Research Council should, if possible, accompany the oil crew.

Respectfully submitted,

D. B. McDougall

E N C L O S U R E S

1. Two copies of a topographical map of part of Permits Nos. 1 and 4.
2. Two copies of a topographical map of Permit No.2.
3. Two copies of a topographical map of Permit No.1.
4. One copy each of two letters describing topographical work done by Blanchet, Trorey and Associates Limited who did the work on Permits No.2 and No.4.
5. One copy each of Interim Report (June 24, 1954) and Interim Report No.2 (August 6, 1954) from the Mines Branch, Division of Mineral Dressing and Process Metallurgy in Ottawa.
6. One copy of letter from myself to G. R. Haun, the permittee of Permit No.4, outlining the geological thinking and conclusions on this permit.



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