OTTAWA September 22nd, 1941.

REPORT

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1096.

Magnetic Concentration of Magnetite Ore from the Childs Leon Mive, Hastings County, Ontario.

many many district the state of the state of

(Copy 96.26)

BUREAU OF MINES
DIVISION OF METALLIC MINERALS
ORE DRESSING AND
METALLURCICAL LABORATORIES



O T T A W A September 22nd, 1941.

REPORT

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1096.

Magnetic Concentration of Magnetite Ore from the Childs Iron Mine,
Hastings County, Ontario.

Durid Glate. Suntil smills south space have brind which supplement (200 have been trude smills south space have send durid supplement (200

Shipment:

A shipment of magnetite ore, having a net weight of 9,431 pounds, was received on July 10th, 1941, from the Frobisher Exploration Company Limited, Bancroft, Ontario.

This ore, taken from the Childs iron mine, in Hastings county, Ontario, was submitted for magnetic concentration tests.

Characteristics of the Ore:

The ore consisted of a fairly coarse-grained magnetite in which the mineral was well disseminated throughout the gangue. No massive magnetite was noticed. The ore was very friable and had a tendency to break to grain size on handling. No pyrite was observed during the crushing of the ore.

Results of Investigation:

- 1. The coarse magnetic cobbing tests were unsatisfactory from the point of view of the recovery of the iron
 and the structure of the final concentrates. The magnetic
 concentrate assayed 53.24 per cent iron, 0.022 per cent sulphur,
 0.026 per cent phosphorus, and 17.03 per cent insoluble. The
 screen test gave 21.4 per cent minus 20 mesh material in the
 concentrate, which would necessitate the removal of all this
 material. This, in turn, would lower the grade below the base
 grade required. For the above reasons it is considered that
 coarse magnetic cobbing is not applicable to this ore.
- 2. A high-grade concentrate with a good recovery of the iron can be obtained by grinding to minus 10 mesh and making a wet magnetic separation. The concentrate from this would require sintering. The concentrate assayed 68 per cent iron, 0.02 per cent sulphur, 0.007 per cent phosphorus and 4.17 per cent insoluble. The iron recovery was 94.2 per cent and the recovery of magnetic iron was 98.4 per cent.

DETAILS OF TESTS:

The ore was divided into two separate lots. Lot No. 1 was used for coarse magnetic cobbing tests and Lot No. 2 was used for fine grinding and wet magnetic separation tests.

(Continued on next page)

(Details of Tests, contid) -

Table No. 1	- 0	- Feed		Samples.								
,	0	tay _ 0 v .L	5	Weight,	9	200 (0.1)		Assays,	þε	r cent		
	ô	Weight,	ò	per	G General		thurs	-				estants are desired the estate to the extension
	9	pounda	ģ	cent	9	e H	17	S	9	P	ţ.	Insol,
eur den in transport en partie, ekk kommittel parkeren string in an an grout mendeligen kommitten in de kommittele parkeren betien de string grout mendeligen kommitten in de kommittele besteken kellen in de string	9	a transition parameters of the proper agent (2007). The rest of the parameters of the property		n mangaram i Vikupilalik kikom binanak intu kantida bila bila kikomenak binada bida artanlah kud kantida bila	MAKE KAR.	e entre to the second s	22.71	delen met for in the same melete createring in labor trough delen elektropischer in voorde elektrol. Dat	er returen.	i grammadir yan an pengganan ma	profession in the	TELESTICAL SE ANTERIO É APTICACION ES TELESTICAL SE ANTERIO É APTICACION ES
Lot No. 1	0	5,220		55,4		44,36		0,026		0,029		22,49
Lot No. 2	ò	4,203		44.6		43.89		0.028		0.029		21.66
	*											
Combined	0	9,423		100.0		44.15		0.027		0.029		SI,SS
	ů											

COARSE MAGNETIC COBBING TEST - LOT NO. 1.

The ore set saide for the coarse cobbing test was stage-crushed through a l_2^1 -inch screen. The ore was then sized on the screen sizes given in Table No. 3 and each screen size passed separately over the magnetic separator (Ball-Norton type).

Table No. 2	0	- Assa	ys and	Reco	verie:	3 .			Constitution and principal profilements to the partie of C
Danadasad	D D	Weight,	7) 6	AЭ	says,	Per	cent	#	Recovery
Product		ber,	O STEERN PROCESSALISTS OF		ergyment er transmitte time. Of to			######################################	rof fron,
	0	tres	: FG	8	S	3	P	: Insol.	tnes requ
entiglishming i med glore in province in mineral find sector in energian, the sector is a figure in except and an array find sector in	4463	ALL MICHAEL THE TWANT CEMERAL MANY TO	on suggested by the second state of the second state of the second secon	AND THE PERSON OF THE PERSON O	ing with a use gapes care for paper and the care and an expension	CHARLETT TO VOLUME A	eria e arche e describit e eria e arche e de constitución	e annu e general de la commentation de la grande de la commentation en Calego de la grande de la commentation de la commentatio	nois bendigi sutarb d'anticolai noi penghi sukusulan araba kandi alaba jisi 406 kg Taare beak di waku si paka si paga kandisi kandi alaba jisi 406 kg Taare beak di waku si paka si paga kandisi
Feed	'n	1.00.0	44.36	3	0.026	0	,029	22,49	100.0
Concentrate	ŝ	61.2	53,24	Ĩ	0.022	0	.026	17.03	73.5
Tailing	60	38.8	30.35	5	0.033	0	.034	31.11	26.5
	0								
AND ADDRESS OF THE PROPERTY OF									

Ratio of Concentration: 1.63:1.

Table No. 3.	re 4.7.184°.		Analysis		toda v kare programov niki to reconversom vice	enen kantantistikan parikki kelesterak sa	ENTER A SECULAR DESCRIPTION OF A SECURAR DESCR
	3	FEEL	not seed to the set officerous to the season as a seed to the set of the set.	CONCEN	AND A CAPACITY OF MANY	: TAIL	CAPAS TAI
Product	; F	er cent:	Per cent:	Per cent	:Per cent	Per cent	:Per cent
Thinks of the state of the stat	0	Weight:	Fo :	Weight	: Fe	: Weight	, Fo
Authority private (1801) A cities and printers and in the	0 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1	and the second of the second s	4. (本)	and has been a survive governing to retire the second of t	e de Languego ne mis de la carece de Constante, en 19 de La manda de Companya de la carece de la carece de Com La frança de la carece de la carece de Companya de la carece de	es electronistro menten 1007,4 % % la depoi de 1314. A la recompta (100,160,100,100), franco de 100,100.	ner end district Meetings and H. R. C. L. Libration (*) Les all mangazines (*), C.
-l=+1 in.	2 0	32.8	44.00	೨೦ ,೩	50,22	36.9	35,98
-l 📲 in.	0	16,6	41.91	13.0	48,35	22,3	35.98
-l + in.	0	11.0	42,95	lo.2	49,21	12.4	34.82
-i +i in.	c	11.0	42,64	12.4	49.21	8.7	27,92
-ㅎ ++ in. -= +20 mesh	*	9.5	46,09	12.8	55.24	4.3	12,81
-20 mosh	G G	19.1	49.06	21.4	64.76	15,4	11.37
Total	n G	100.0	44.36	100.0	53,24	100.0	30,35

THE CONTROL OF THE PROPERTY OF THE CONTROL OF THE C

Conclusions from Coarse Magnetic Cobbing Test:

- 1. The ore is not amenable to coarse magnetic cobbing.
- g. A satisfactory grade was not produced until the ore had been crushed to minus $\frac{1}{4}$ inch.
- 3. The concentrate contained 21.4 per cent of the material in the minus 20 mesh size. This makes the product unsatisfactory structurally. Removing this material would lower the grade below the base grade required.
- 4. The recovery was low, as indicated by the high iron content of the tailing.
- 5. The ore was very friable and crushed readily, producing a large proportion of fines. Fines were even produced by the ordinary handling of the ore.

FINE GRINDING TESTS - LOT NO. 2.

In this test the ore was crushed to minus $\frac{1}{8}$ inch and then ground in a ball mill in closed circuit with a lo-mesh vibrating screen. The undersize went to a Roche wet magnetic separator. The middlings from the separator were returned to a Dorr classifier for thickening, the sands being returned to the ball mill and the overflow to waste.

The ore ground very readily, giving a high-grade concentrate with good recovery.

Table No. 4. Product	0	- Assay Weight, per	e el marte al marte de la marte de la composition della compositio	coverles. says, Per	cent	Dolly Hamilton and American County,	:Recovery
En els antifacts (\$10.00 \$		cont	Fo	; S	2 P	: Insol.	per cent
ermannsertigerifens krieft fally met zu pertamiteten.	0	Constituting and analysis of the Constitution	THE RESIDENCE AND PARTY AND A RESIDENCE OF	and fight of the second of	and a security of the security	p die h. de rocht (fill i fill liberroende de plan nacht 1887) is bie ook	- Samue e in cangini ani can en foto-go-tre pendi cantificante a carrigi
Feed	ô	100.0	43.89	0,028	eso, o	21.66	100.0
Concentrate	Ş	60.7	63.14	0,024	0.007	4.17	94.2
Tailing	ě	39.3	6,42	0.034	0.064	48.69	5.8
Section of the Control of the Contro	, C	arijeratinas pilsimentaises marrieta	nin Ting (17) pangangan kanggalan da anggalan k	e de la composição de la c	More Compared the Compared Com	こうさい すじがくまういかん ティッハ・カンシ とだい	THE SECRET SHEET S

Ratio of Concentration: 1,65;1,

Recovery of Magnetic Iron

(by Davis tube): 98.4 per cent.

(Fine Grinding Tests, contid) -

A preliminary test, using the rejects from the coarse cobbing test, was run and gave identical results at a slightly finer grind.

Table No. 5 Screen Test of Concer	ntrate.
-----------------------------------	---------

Minimize department of the Control o	proportion to the contract of	Woight,	:Cumulative Weight:
CONTRACTOR OF COMPANY AND ASSESSMENT	1.20	per cent	9 DOT CONT
	go The retirement of the first of the say to the first of the said and the first of the said from the first of the		G 14
+ 35	ç	6.7	C) o'f
4 48 + 48	9	10.7	17.4
+ 65 +loo		14.9	32.3 47.7
*150	ě	15.4 13.9	61,6
4200 4200	9	10.0	71.6
-200	9 0	28,4	300.0
	0	100.0	-
Section and the supplication of the section of the	n 0	The section of the second seco	Contain teachilistic employees are conserved and action of the company of the construction of the construction of the conserved and the construction of the conserved and the

Table No. 6. - Analysis of Concentrate.

serves, traded as an add the simple of the strategy parties of the serves of the six parties.	manuscripture	dia montre in esta posta entre Colomon se susta de l'ampre de l'ampre de l'ampre de l'ampre de l'ampre de l'ampre e
	ô	
	9	Per cent
e mande en mer en parte en en automograf by Alpha en men anne man en mande. En beste by en en mande en parch e En angelende de mande en de en ante en	THE PROPERTY OF THE PARTY OF TH	tiges representation of the production of the production of the second of the second of the contraction of the second of the sec
	ó	and the
Soluble Iron	0	67.93
Sulphur	t) G	0.02
Silica	0 17	2.87
Aluminium oxide	n G	0.76
Magnesiwm oxide	a v	0,1.8
Calcium oxide	0	0.89
Tî tani um	9	O.Ol
Manganese	Ç	0.10
Phosphorus	0	0.08
THE STATE OF THE S	tr S Serventer	መመሪሁ ዘልተ አንስሲ መርቀን ነኞች መጀም ተለት ማዕስት በትር ሲኖታ የተለት የሊረ ህግትን የሚ ይት ትላህ ትላህ ሂግር በሚፈር ሃገር ነርት ቢር ለመረሳች ያቸ ሂደር ያ
more or resident to the first and the second of the second	THE FRANKS AND STREET,	A COLOR OF THE CASE OF THE CASE OF THE PARTY

Conclusions from Fine Grinding Tests:

- 1. A high-grade concentrate with very good recovery of the iron can be made by grinding the ore to minus 10 mesh and making a wet magnetic separation.
- 2. There is very little contaminating mineral, the sulphur and phosphorus being very low.
- 3. It would be necessary to sinter the concentrate to make a satisfactory furnace feed product.

၀၀၀၀၀၀၀၀၀၀၀ ၁၀၁၂၀၀၀

KNS:GB.