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Tittel

Edfjord Iron Mines

Forfatter	Dato	År	Bedrift (Oppdragsgiver og/eller oppdragstaker)
Hielm, Hans A. Main, J.M.	Aug	1900	

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Ballangen	Nordland		13313	Narvik

Fagområde	Dokument type	Forekomster (forekomst, gruvefelt, undersøkelsesfelt)
Gruveteknisk Analyse Økonomi Malmberegning		Jernlien Schønnings gruve

Råstoffgruppe	Råstofftype
Malm/metall	Fe, Flusspat

Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

Rapport på engelsk i to deler.
Beskrevet forekomst på østre side av indre del av Efjorden. Beskriver en undersøkelse og drift basert på innlevet meget rik t håndstykke. Analyse viser 57 % Fe og lite P og S.
Beskriver en høykvalites malm som har noe flusspat(?) og som er verdifull i smeltingen . samt hva som er bygget opp av anlegg og er vurdering av malmtilgangen.
Det anbefales videre arbeider i feltet.

Kartskisser det refereres til er ikke med.

1900

Hil.

NB.

Jemtlien.

EDFJORD IRON MINES. Lødingen

by

H.A. H i e l m and J.M. M a i n.

E d f j o r d I r o n M i n e s.

On my journey in Nordland in Norway in the summer 1897 an iron ore sample of magnetite was brought me from "Jernheie" in Edfjord, Lödingen parish. I let the sample analyse by Mr. Schmelck of Christiania, and it gave 68 % iron, titan only trace and a very small percentage of phosforous and sulphur.

On my return to Christiania I got some people interested in the matter, and sufficient money was raised to an inspection by the governmentinspector and myself. After this a company was formed and work started.

The mine is situated as the map shows 320 m above the sea. The fjord is free from ice all year round.

About £ 6 000.- have been spent on the mine, and a new company will save considerable expenses on account of the work, that allready has been done.

I started on the 14th of Nov. 1897 to work and built: First of all barracs for 60 men, dynamithouse and smithy. later on a building near the loading place to accomodate another 40 men, manager, engineer and foreman. A quay and also a store with good cellar for keeping food etc. were erected.

The road from quay to mine is only 1 m wide, but substantially built. It takes about 30 minutes to walk the distance.

A petroleum-motor to winch the ore and also in summertime bring fresh air in the mine was placed in the mine.

In course of the winter 97-98 about 1500 tons ironore was transported down to the wharf by a wooden shoot. This ore was sold to Mr. Wm.Whitwell & Co. Thornely iron works, Stockton on Tees.

The rate was 17 sh. a ton, and as the price of ironore in 98 was very low, it shows it value. Wm.Whitwell & Co. have afterwards written to me several times and asked me, if I could sell them more ore from Edfjord.

It contains some Fluerspa and Colespa, which is a great value during the smelting.

After having transported this trialcarge of 1600 ton the wooden shovt had done it service and was worn out. The idea was to build an aireal-tramway with a capacity of 100 tons in 24 hours. The foundations to this tramway have been built.

The main-mine (Schönings mine) has been driven to a depth of 150 feet, and the bottom looked very well, when the work stopped. Outside on the main lode, that varied from 2 to 4 m. a parallel lode 1 m. wide was found in the bottom of the mine, which can be driven in connection with the main lode as being so close by.

My partners in Christiania negotiated with a Glasgow firm, who sent their expert, Mr. Main, up for inspection in the fall 1898. The terms were £ 30 000 cash and the Glasgow people made an offer of £ 10 000 cash and shares, but my partners refused it.

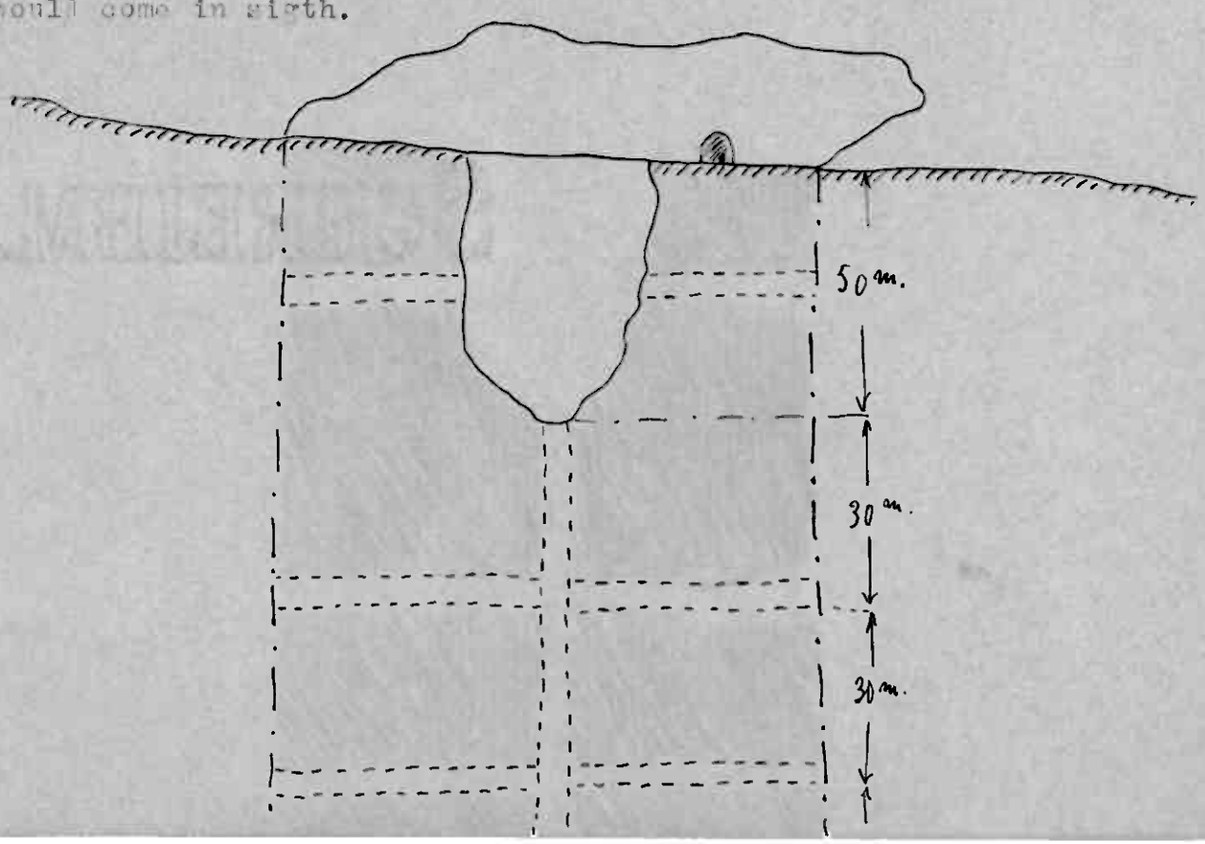
Mr. Mains report will follow.

However my firm failed in 1899, and I personally could not continue the work at the mine alone.

Since this time no work has been going on and the mine is partly filled with water.

Ready for shiping is about 7000 tons. Besides about 500 tons sorted ore is stored.

My proposal is to continue the shaft and by every 30 m to run levels south and north in the strike. If this prospecting work turns successfull, which I, in consideration of the already made exploration, should believe, a considerable amount of ore would come in sight.



Ore in sigth after the proposed work is completed.

Ore on gras	300 Tons
Ready for stoping	7000 "
After having sinked 60 m. and by calculating the ore only to be 70 m. long and 2 m. wide:	
60 m X 70 m X 2 m wide = 8400 m^3 X 4 tons =	33.600 "
In case the ore continue the above mentioned 60 m; another 30 m. can be depended upon	
30 m X 70 m X 2 m = 4200 m^3 X 4 =	16.800 "
	57.900 tons.

60 000 tons ore of this quality will realise a net profit of at least between 12 & ₤ 15.000.- , when the rewaired arrangements have been established to its mining and transport.

These arrangements consist in an addit driven from the mountainside, untill it strikes the lode about 90 m below the present bottom to the mine. This addit will be about 250 m long and will cost about ₤ 600.-

From the mouth of this addit about 170 m above the sea down to the quay, an aireal tramway should be built able to transport at least 100 tons in 24 hours, an in combination with rebuildeng the quay will cost about " 600.-

₤ 1200.-

An outlay which easily could be done with 60 000 tons of ore as basis.

Another ₤ 800 as working capital would also be wanted.

When this addit is completed and the ore-lode is struck a continuation of the sinking in combination with stoping above could be commenced. later on an other addit near the wharf should be started.

By making the above proposal I have especially taken into consideration not to spend any money, unless it is well placed and the workings are given their returns.

This same princip will also be used on the preliminary prospecting work, which will not exced ₤ 900.-

60 m shaft 2 m X 3 m. at Kr. 80.- per meter = Kr. 4.800

60 m shaft 2 m X 3 m. at Kr. 80.- per meter = Kr. 4 800.-

2 levels at 30 & 60 m depth:

70 m each X 2 X 40 Kr. pr. meter " 5 600.-

Other expenses including stoping

hoisting, sorting etc. " 5 000.-

Kr. 15 400.-

Returns:

Ore on grass sorted 800 tons

Ready for stoping 7000 "

The shaft and the levels will give about

920 m^3 or about 3680 tons. However the

bottom shows at present a lode over 2 m. wide

and it will only take 7 m. to sink, before

their number of tons are available 3800 "

11000 tons

The 16 800 tons of ore, which yet has not been extracted can be transported through the present opening of the mine.

A preliminary rope-way strong enough to bring the 11 000 tons down to the sea can be built for less than Kr. 3000.-

If the profit of the ore only is put to Kr. 3.- pr. ton, this profit Kr. 33.000 will cover all the expenses by the prospecting work. The most of the work can be done by contracting.

In consideration of that, all the big expenses have allready been paid, houses and smithy built, motor erected etc., the mine opened for 30 m. in depth and tahe the bottom of mine looks most encourageing, thie prospectinx is a very good one.

Besides must also be remembered the fine quality of the ore, the ore on grass, the ore ready for stoping.

My opinion is, that the deposite does not only consists of the above described mine, but of a number of such stocks, of which I personally have seen a couple along the mountain-side.

Mr. Mains opinion was also, that these stocks come from a larger ore-body, and that the proposed adits from the mountain-side lower down will probably cut parallel lodes, which yet have not been discovered. The country rock is granite and the bearing wall schisty granite impregnated with magnetite.

The concessions comprises 31 claims fixed and attested by the law and measured and by the bergmaster. The ground is covered by earth and stones and a rich birch-forest is growing along the hill-side.

B o d ö August 1900.

H a n s A. H i e l m.

Report on the Ådfjorden Magnetic Iron Ore Mines.

I have carried out your instructions, by visiting these mines, and now have the pleasure in submitting my report thereon.

Situation. The mines are situated about 10 miles south of the Ådfjord on its eastern shore half way up the slope of the Jernlien or "Iron Mountain" in the parish of Loedingen and country of Nordland, Norway.

Extent and Mining rights. The concessions comprise 31 claims fixed and attested by the Bergmester, and according to the mining laws of the country the holder or holders have the exclusive right to the working of the lode or lodes known to exist in these claims, however far they may extend either vertically or longitudinally. The holders of these claims have also the option of carrying out any operation outside their boundaries with a view of developing further. In conducting such work should any new lodes be discovered the prerogative to work such may be secured by the taking out of fresh claims. There are no plans locating the above claims, they are merely staked off by the bergmester along the "strike" of the lode beginning from fixed point.

From an interview I had with the Bergmester at Bodö, I am satisfied of the validity of Messrs Basche-Wiigs Mining rights. Practically speaking these rights extend to the working of any part of the "Jernlien" which has a longitudinal extension of several eng. miles.

Geological Structure. The mountain "Jernlien" on which the mine is situated is principally composed of Granite and Metamorphic rocks, chiefly Syenite.

Occurance of Ore. Outcrops of Magnetite to the day occur on the western slope of the mountain. The surface of this slope is covered with a growth of small birch trees and Brushwood together with a large quantity of broken granite and gneiss rocks and under such circumstances it is somewhat difficult

accurately to define the run of any particular vein. Ore has been traced here and there along the mountain side for several kilometers in a north and south direction, and although there cannot be a positive certainity that they are one and the same lode, still taking in account the bearing of the lode as proved in the mine and that this is an alignment with the outbursts of the ore referred to, it is, I think, a fair inference that there are a continuation of the same lode.

Position on description of the lode. The point at which the lode has been attacked is over 1000 feet above sea level, and about 300 yards up the mountain slope from the eastern shore of the Eidfjord. No plan had yet been made of the workings, but the accompanying sketches No.1 and 2 will show approximately what has been done in opening up the lode.

The figure No. 1 which is a cross-section of the lode as worked is shown coloured red, and leading at angle of 30 1/4 to the east. "A" represents the cavity worked at the outburst to this day, "B" "C" and "D" are short levels along the strike of the lode, while "G" is a crosscut to the east, driven in the hanging wall.- The footwall in most places is well defined, but the hanging wall is irregular.

Figure No. 2 is a longitudinal section and shows roughly the north and south extensions so far as these have been made. In this section the worked out area is coloured red, while the solid ground is coloured to show the nature of the strata. According to the manger's statement between 3000 and 4000 tons of ore yelding over 50 % metallic iron have been taken from the Sinking and the Branch workings, this returns tallies closely with my calculation, obtained from a measurement of the cubic content of the area waste as shown in the sketches and indicates that the great bulk of the ore already extracted has been ore of passable quality.

As the facings and workings now stand, however, the lode is much mixed with gangue gneissical granitic impurities, showing that the ore is not continuous but lies in pockets (at any rate to baout 100 feet from the outcrop).

The best body of ore I found on the south side of the shaft at F figure No. 2. Here the ore is from 9 to 10 feet wide and is of excellent quality. In the lowest part of the sinking the ore is f from 3 to 4 feet wide and is of the same good quality as that on the south side. The appearance of the ore on the north side is however poor the whole way down.

A crosscut C as shown in Fig. No. 1 has been driven for a distance of 20 feet in hard gneiss, and here at the time of my inspection there were indications of another ore vein and fluor-spar having made their way in the upper part of the Driftway. At the point H Fig. 1 where some excavation is being carried on a piece of ore has also been discovered in the footwall.

It but as this has just been cut a day or two before my arrival it is impossible to say how it may open up. As a result of my observations I am inclined to think 1st.- that in all probability the lode at present being worked is not a main lode but a leader or off shoot from it, and 2nd- that the persistence of the ore downwards is closely indicative of there being larger masses of ore in close proximity. There were 14 men working at the mine at the time of my visit and 26 men on the surface. Sample No. 1 and No. 1 a were carefully taken from the bottom of the sinking and from the side marked on section figure No.2 respectively. To secure the average result I have had these samples blended and analysed by Dr. Hellan of Whitehaven whose assay (No.1) I give below. I also took samples from other parts of the mine but considered it would show a true average of quality to take a sample (No.2.) from the ore lying in bank, which according to the managers amounts to about 2 000 tons.

Dr. Hellan's analysis of this sample, which may be taken as a thoroughly representative one is also given below.

The County Analyst-Laboratory

Whitehaven, Nov. 17th 1898.

Dear Sir,

I beg to inform you that the following is the result of my analysis of the samples of magnetic iron

ore you submitted to me. They were marked: Edfjorden No. 1 and Edfjorden No. 2.

"Edfjorden"	No. 1	No. 2
metallic iron	57.40 %	57.20 %
Silica	7.00	-
Sulphur	0.01	0.01
Phosphorus	0.01	0.01

Yours truly

Robert Hellan (sign.)

The amount of silica is No. 2 sample was not determinated

Surface works. The tracing attached here shows the position of the mine, the winding pathway leading from the wharf (now in course of erection) the manager's house, wooden houses for the accommodation of the workmen, the joiners shop, smithy etc.

Mr. Hilem, manager, informs me that between £ 5 000- and £ 6 000 have been spent on surface works together with the development of the mine. The initiatory work must have been of a very arduous description as all the material for the mine as well as for the erection of houses has to be dragged up the steep slope of the mountain, which in its original condition must have been in a very rough and rugged state. As mentioned above a long winding pathway from the wharf to the mine has now been made, in itself a work of no ordinary difficulty and cost. A good and substantial wooden house has been built for the manager with barracks attached for the accommondation of 25 men. Another house is in course of being built for the mine overman. In adition to the above there are several small houses for the workmen both at the mine and at the shore, as well as a joiner's shop and smithy.

Wooden shoots only 8" square lined with thin iron on the bottom and sides have been in use for the transport of the ore from the mine to the shore. Mr. Hielm tells me that over 1500 tons of ore have been run throught these boxes. There can be no question that this primitive method of conveyance must have been

both very slow and costly, and it goes without saying that the shoots are now of very little use.

Much of the preliminary expenditure has been I think unnecessarily incurred, as had a wire rope way been in use to begin with, the conveyance of material to the mine and ore to the wharf could have been dealt with at a comparatively small cost. The situation is most favorable either for a wire way or a bankage incline and if laid out in the proper manner and provided with a good Down Brake the rope could be worked without any motor power whatever.

Wharf and loading. The wharf at present being constructed is a wooden erection but rather lightly built for a large traffic. As good stone is to be had in abundance, there would be no difficulty in building a strong and substantial pier, as there is deep water close to the shore for the accommodation of vessels of large tonnage, the shallowest water being in the Fjord several miles north of the mine. At ebb tide the depth of water here is 22 feet.

Estimated cost of working the ore and freightage to England.

The calculation of cost can be based on the present working but the conditions are such as to unable me to place before you a fair approximation to the cost of production, as also cost of transport from the mine and freightage to east Cost of England.

It will however be necessary to assume that a new drift such as I indicated be driven and ore cut at this level from 8 to 9 feet wide, with a daily output of from 150 to 200 tons, the cost would probably be as follows:

Winning cost (included explosions)	3/3 per ton
Top cost	-/2
Shores	-/1
Transport of ore to wharf	-/1
Wharf charges	-/2
Management	-/3
Freightage to east C. of England	6/6
Dock dues	-/6
Total cost	11/- per ton.

With a large output of course a considerable deduction in the cost would be affected.

The present selling price for this class ore is about 16/.- per ton, which on the above scale of cost would show a profit of 3/.- per ton.

After sell consideration of foregoing facts I have come to the conclusion that this is a matter well worth your attention for the following reason:

1st) Excellent quality of ore.

2nd) The vein has been proved to a depth of 150 feet from the outcrop and at this depth we find the best body of ore at present in the mine.

3rd) Good general conditions for the working and developing of the mine.

4th) Comparatively cheap production.

5th) No royalty rents.

6th) Norwegian Mining Laws offer every inducement for exploratory work outside the existing claims.

It would suggest the driving of a level drift from some convenient point in the mountain side and from 50 to 100 ft. below the bottom of the present mine. This will not only facilitate and greatly cheapen the working of the ore, but it will crosscut the ground at right angles to the run of the veins and so find the position of the master lode besides intersecting any fresh offshots either the foot or hanging walls.

Before determining the position of this level, it would be well to have a correct plan and section of the working.

A wire rope way from the mouth of the new drift to the wharf would also require to be constructed. To carry out the above work a sum of from £ 1500 to 2000 should be provided a judicious expenditure of which will I feel sanguine be attended with success.

I am, Yours truly

J.M.Main. (sign.)