

Sirjan Iron Ore Complex

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Gol Gohar mining region by possessing rich iron ore mines is considered one of the most active mining-industrial hubs in the Middle East and has rich potentials for becoming a large and competitive region throughout Iran and even in the world.

These mineral deposits are located in the Province of Kerman and 50 km southwest of Sirjan. The existing sites and the remaining excavations in place of the deposit

imply that this mining region has been identified and exploited in the past centuries. The approximate age of a sample of the old furnace slag of Gol Gohar mine has been estimated at about 900 years. The deposit of Gol Gohar Iron ore in six separate anomalies with a total deposit amounting to over 1200 million tons is located in an approximate length of 4 km.

Sirjan Iron Ore Complex is among creditable and large complexes in the country which started operation in 1387 (2008-2009) within the framework of a project for equipping Gol Gohar 2 and 4 Mines in the field of excavation of iron ore. Now by possessing anomalies 2 and 4 it is continuing its activities under the supervision of the Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO).

Gol Gohar 2 anomaly is one of the six identified deposits in Gol Gohar region. Exploration operations on Gol

Gohar 2 mass were conducted in the first phase in a regular network with a length of 1400 meters and a width of 550 meters and the drilling of 41 exploratory wells in a distance of 100 meters. At this stage 7444 meters of excavations were conducted on the mass.

The second stage of exploratory excavations was conducted in an area of about 3146 meters in the calendar year 1385 (2006). The third phase of exploratory excavations of the mine which began in the month of Khordad (May - June) 1390 was finished with the drilling of 12 wells and a total excavation of 1421 meters in the month of Azar (November - December) the same year. Up to the end of the third phase, a total of 12018 meters of exploratory excavations were made in the vicinity of Mine 2. The last stage of excavations of the mine started in 1391 (2012 - 2013) and is underway. So far 52 wells have been drilled with a total of 8182 meters. On this basis,

the total exploratory excavations on this mass since the beginning up to date are over 20193 meters.

Based on surveys conducted to date, the amount of geological reserves of the mine has been estimated around 56.5 million tons of iron ore which has increased by about 3 million tons compared to the reserves estimated at the end of the third phase. According to the latest mineral extraction project which was conducted at the end of phase 2 of the excavations, 48 million tons of iron ore reserves with the tailings of approximately 3 to 1 will be extractable.

In the final plan of the mine, extraction operations have started from the surface (approximate a height of 1745) and will continue to the balance of 1530 (approximate mining depth 215 meters). At the end of the excavation operations by interlocking every 2 steps of 15 meters the height of the final steps of the mine will reach 30 meters (fourteen

15-meter steps will be turned to seven 30-meter steps). The length and width of the mine at the end of its life will reach 1700 in 900 meters. The steep of the working stairs of the mine under normal condition and for the stone walls is 60° and for alluvium 45°. The steep of the final wall of the mine in the alluvium section is 38° and in the stone section is 45°.

During the life of the mine usually a safety stair is considered at each horizon. On this basis, the width of the safety stair for soil and stone stairs with a height of 30 meters is considered at 10 meters. Under the present condition and with regard to the machinery available, working stairs in the tailings and alluvium have a height of 15 meters.

Extraction operations of Gol Gohar 2 Mine started on October 29, 2005. At present

mining excavations are focused in the central and southern parts of the mine and the deepest section of the mine has a balance of 1605. In the calendar year 1393 (2014 - 2015), about 9.4 million tons of tailings and about 3.2 million tons of iron ore were extracted from Gol Gohar 2 Mine.

Production plan for the calendar year 1394 (started March 21, 2015) in Gol Gohar 2 Mine include extraction of 3,500,000 tons of iron ore and 1,400,000 tons of aggregated iron ore. At present approximately 900 work force including the manpower of the employer, contractor and supervisor are working in Gol Gohar 2 Mine.

Gol Gohar 4 is also one of the six identified reserves in Gol Gohar region. Preliminary exploration operations of Mine 4 were initially car-

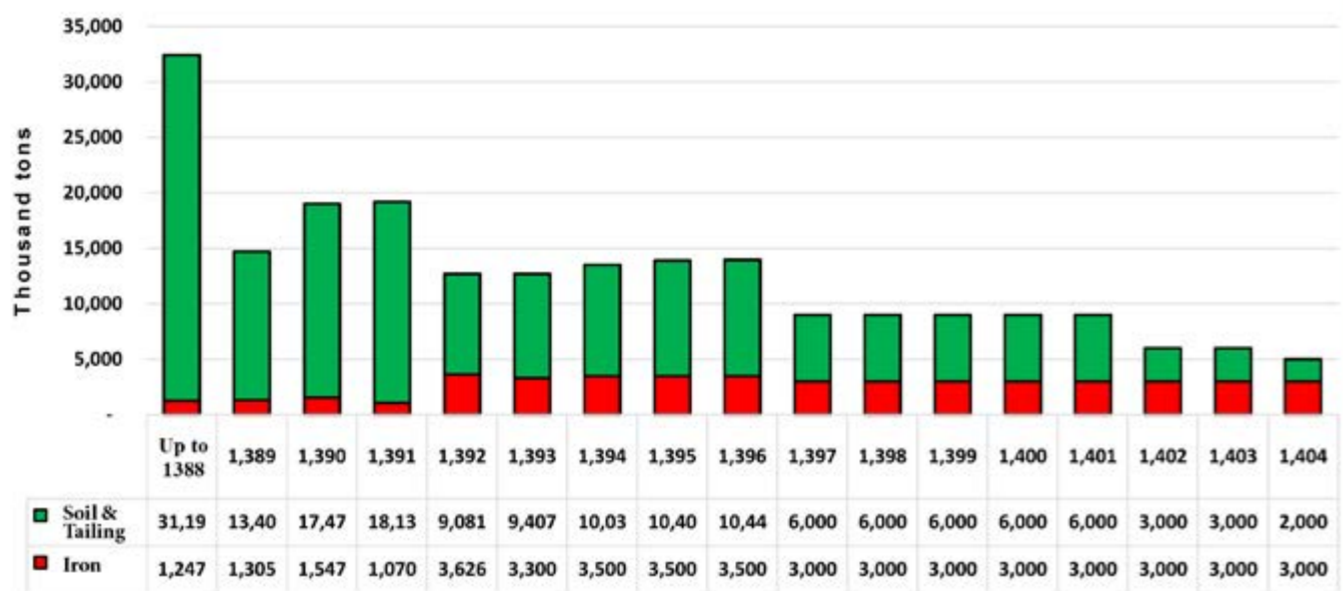
ried out by using magnetometer method. Then through conducting geophysics operations areas with anomalies were selected for excavation. Exploratory excavations in the mine have taken place in several separate phases. From the year 1384 (2005/6) to 1390 (2001/2) a total of 99 exploratory wells were drilled around Mine 4. The total measurement of the drilling carried out so far is 30488 meters of which 4150.6 meters have been within the mineral substance.

By using the data obtained from exploratory excavations up to the year 1390 (2001/2) the geological reserves of the mine was estimated at about 93 million tons. It is noteworthy that the new phase of the excavation operations started in the month of Shahrivar 1392 (August/September 2013) and

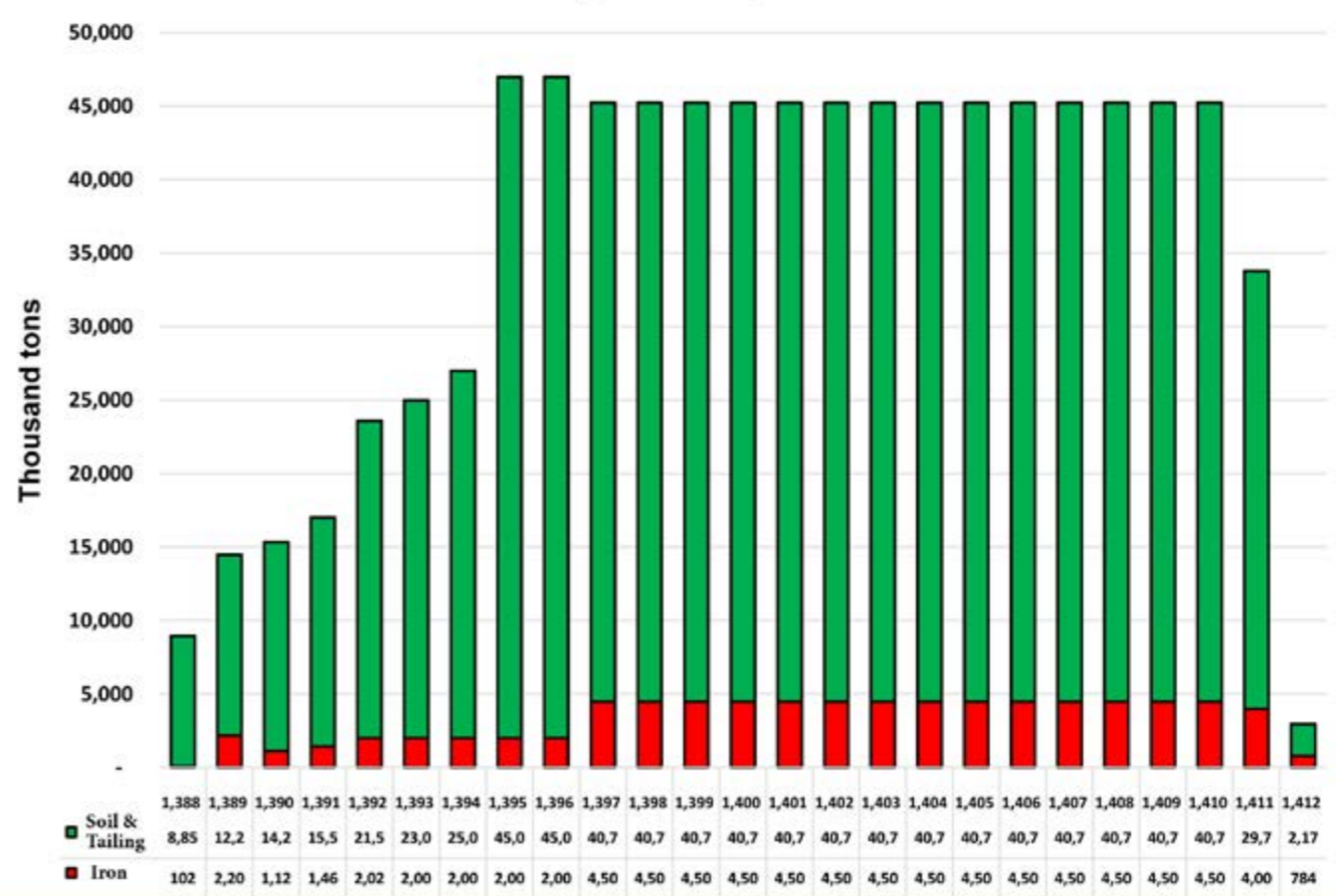
continued up to the month of Bahman (January/February 2014). In this stage, 8 exploratory wells were drilled with a total measurement of 4065.8 meters of which 501.6 meters were in iron, 2874.4 meters in tailings and 689.8 meters in alluvium. With regard to the new phase of the drillings it is expected that about 4.8 million tons of geological reserves will be added to the geological mining.

On the basis of studies conducted on this mine the amount of extractable reserves were determined at 83 million tons with an iron alloy of 49% and with the tailings ration of 10:1. This mass has an eastern-western extension the expansion of the final pit of which is 2100 and its widest expansion 1300 meters. The balance of activity of the mine

Extraction of Iron Ore and Tailings in Mine 2 up to the Year 1392 and Onward



Extraction of Iron Ore and Tailings in Mine 4 up to the Year 1393 and Onward



starts from horizon 1770 and at the final edge reaches a balance of 1290 and the depth of the final pit will be about 480 meters.

Currently the balance of activity of the mine is 1620 and since the start of its activity to date, 10 stairs have been opened and the current depth of the mine is 150 meters. The height of the designed stairs is 15 meters and the steep of the wall in the alluvium is equal to 38 degrees and in the stone section 45 degrees. The width of the safety stair for soil and stone stairs with a height of 30 meters is 8.4 and 16 meters, respectively and has been considered at 4 meters for the final pit of the mine.

Extraction operations of Gol Gohar 4 Mine started on 6 August 2009 and are still underway. Under the present circumstances and with the available machinery the working stairs in the tailings and alluvium have a height of 15 meters. Presently iron ore extraction is focused on the bottom and eastern balance of the mine and the deepest part of the mine balance is 1620.

In the calendar year 1393 (2014/15) about 25 million tons of tailings and approximately 2 million tons of iron ore were extracted from Gol Gohar 4. The plan for production in the current year (1394) in Gol Gohar 4 includes 2,000,000 tons of iron ore. At present a work force of about 750 people, including workers of the employer, the contractor and the supervisor are busy in Gol Gohar 4. Production plan of Gol Gohar 2 and 4 up to the completion of exploration operations have been separately shown in the tables below. ■