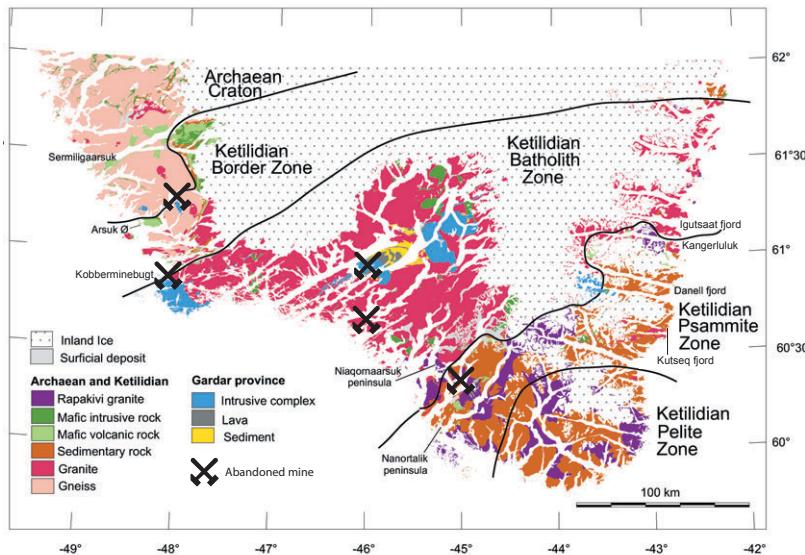


Early mining activities in South Greenland



Locations and history

Mining in Greenland has long been an important element in the exploitation of the country's natural resources, and the mining tradition extends far back in time.

Exploration for minerals was introduced in the 1700s and 1800s, although it was of course on an extremely modest scale in comparison with present standards. Exploitation of the mineral ores increased at the start of the 1900s, when the cryolite mine in Ivittuut was increasingly active in southern Greenland, where there had been mining operations since 1854.

An attempt to mine copper in the area had been made in 1850s, at the so-called Josva Copper Mine. Inadequately known quantities of ore, simple technology and a number of ship losses were significant reasons why the copper mine had to be abandoned at that time.

Modern mining

In the period before the First World War the new industrialisation required copper and graphite for the rapid developments occurring in the use of electricity. This was the situation when a new attempt to mine

copper was recommenced at the Josva copper deposit. From 1904–15 the Josva Mine was in operation, and it was closed because of decreasing ore grade. Shortly thereafter the company dismantled the mine town and plant, and moved the equipment to Amitsoq in southern Greenland, for use in a new graphite mine. The Amitsoq mine went on until 1924, and mine activities were abandoned due to the downward tendency for commodity prices and the general depression after the war. Only the cryolite mine continued and even steadily increased profit until its closure in 1987.

In the period from 1958 to 1980 the Danish state conducted exploration and test mining for radioactive commodities around the Kvanefjeld deposit in South Greenland.

Mining logistics

Mining in Greenland must be organised from the basic level with the equipment plan and infrastructure, and the entire operation must be based on all necessary materials, supplies and fuel having to be transported to Greenland by sea traditionally, and by air in modern activities.

Mining for cryolite 1854–1987 – Greenland's white gold in Ivittuut

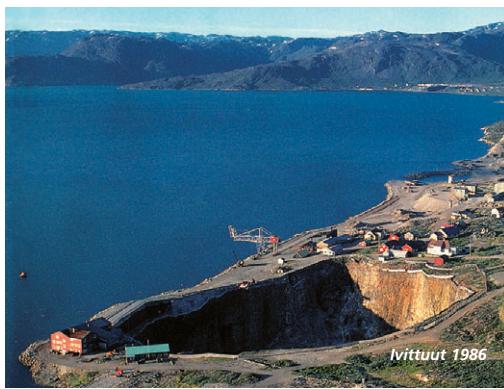
3.7 million t of ore was mined in the period with an average content of 58% cryolite in the ore.

Mining began in 1854 with galena as the target. Soon after cryolite became the key commodity. Cryolite was used in the production of soda and iron enamelling until 1887. From 1887–1987 cryolite was used as a flux

Mine	Commodity	Time	Production	Ore grade
Ivittuut Cryolite Mine	cryolite	1854–1987	3.7 million t	58% cryolite
Josva Copper Mine	Cu	1904–1915	2.200 t	3.5% Cu
King Frederik VII's Mine	Cu, Ag	1851, 1912	18.0 t	5.4% Cu
Kvanefjeld Uranium Mine	U	1958 / 1980	20.000 t	365 g/t U
Amitsoq Graphite Mine	graphite	1915–1924	6.000 t	21.5% graphite



Ivittuut 1898



Ivittuut 1986

in the production of metallic aluminium – the use which made cryolite indispensable to modern industry – and the application of aluminium.

Ivittuut was the only cryolite mine in operation world wide so far. After 1987 the operations turned out to be uneconomical and the activity was terminated. Today cryolite is made artificially.

Mining for copper 1904–1915

2200 t of ore was mined in the Josva Mine in this period – with 3.5% copper in average. Byproducts from the production were 0.5 kg gold and 50 kg silver.



Josva 1911



Amitsoq 1920

The total production went on from underground levels down to 100 m. There were high expectations to the copper mining, and a smelter was installed. Capital and man power were designed as half size of the Ivittuut mine. Amount and grade were too limited to be economic. Smelting operations failed and the mine was abandoned after 10 years of operation.

Amitsoq Graphite Mine 1915–1924

During the lifetime of the mine 6000 t of ore with 21% graphite were mined underground and in open pit. The mine was abandoned after difficulties in separating the graphite flakes.

The deposit still has a calculated resource of 250,000 t of ore which averages 20% graphite.

The company behind the Josva Mine established the mine and the equipment and buildings from Josva were moved to Amitsoq. The graphite mine was partly financed by international capital for the first time in Greenland mining history.



Kvanefjeld 1958

Mining uranium over the period 1958–1980

20,000 t ore with 365 g/t U in average was mined on a pilot scale in several runs. The mining was carried out underground from a 1000 m drift; calculated reserves are up to 56 million t. Further activity ceased after the early 1980s.

Key references

Bondam, J. 1992: Graphite occurrences in Greenland – A review. Open File Series Grønlands Geologiske Undersøgelse 92/6, 32 pp.

Pauly, H. & Bailey, J.C. 1999: Genesis and evolution of the Ivigtut cryolite deposit, SW Greenland. Meddelelser om Grønland, Geoscience 37, 60 pp.

Petersen, O.V. & Secher, K. 1993: The Minerals of Greenland, The Mineralogical Record 24,2, Arizona, U.S.A. 67 pp.

Secher, K. & Burchardt, J. 2000: Modern mining technology 100 years ago. In: This is Greenland 2000–2001 (Danker, P. ed.) Government of Greenland and Royal Danish Ministry of Foreign Affairs, 166–161.

Sørensen, H. (ed.) 2001: The Ilímaussaq alkaline complex, South Greenland: status of mineralogical research with new results. Geology of Greenland Survey Bulletin 190, 167 pp.



Greenland Resources A/S
Tuapannguit 38
P.O. Box 821
DK-3900 Nuuk
Greenland

Tel: (+299) 32 79 13
Fax: (+299) 32 79 14
E-mail: gras@greenet.gl
Internet: www.resources.gl



Bureau of Minerals and Petroleum
(BMP)
Government of Greenland
P.O. Box 930
DK-3900 Nuuk
Greenland

Tel: (+299) 34 68 00
Fax: (+299) 32 43 02
E-mail: bmp@gh.gl
Internet: www.bmp.gl



GEUS

Geological Survey of Denmark
and Greenland (GEUS)
Øster Voldgade 10
DK-1350 Copenhagen K
Denmark

Tel: (+45) 38 14 20 00
Fax: (+45) 38 14 20 50
E-mail: geus@geus.dk
Internet: www.geus.dk

Author: K.Secher
Editor: K.Secher
Layout: GEUS, Grafisk
Printers: FROM & CO
© GEUS 2002