Product: Ores and concentrators

Summary

Ores contain information on production at mines and mining areas with information on the name of the mine/mining area, type of ore, years of production, amount of ore and metal contents, produced amount of waste rock and other information. Ores also contain information on reported reserves & resources at Swedish deposits with information on the type of ore, amount of ore and metal content.

Concentrators contain information on the amount of ore processed at the concentrator and the amount of mineral concentrate produced, all with metal contents. The amount of tailings produced has been calculated as the difference between the incoming ore and the outgoing mineral concentrate.

Statistics on ore in Sweden are useful for decision-makers in municipalities, counties and central government, for mining and exploration companies and for the general public. Here you can see where the mines and concentrators of the last hundred years have been and what they have produced. Information about possible future ores is also included.

Data format: CSV (text), GeoPackage (database)

Coordinate system: SWEREF99TM (EPSG:3006)

Data download

Link to download the complete dataset as a GeoPackage database:
https://resource.sgu.se/data/oppnadata/berg/malmer-anrikningsverk/malmer-anrikningsverk.gpkg

Link to download the complete dataset in text format (csv):
https://resource.sgu.se/data/oppnadata/berg/malmer-anrikningsverk/malmer-anrikningsverk.zip

Link to Atom feed:
https://resource.sgu.se/oppnadata/berggrund/malmer-anrikningsverk-nedladdning.xml

Content of delivery

File/table name	Format	Content
Alternative text format:		
malmer-anrikningsverk.zip	Zip	
malmer.csv	Semicolon separated text	Ores: Information on production at mines and mining areas as well as information on reported reserves & resources at Swedish deposits.
anrikningsverk.csv	Semicolon separated text	Concentrators: Information on the amount of ore processed at concentrators and the amount of mineral concentrate produced.
referenser.csv	Semicolon separated text	References: Information about references. The *code* attribute can be linked to the *code_ore_area* attribute in malmer.csv and *code_conc* in anrikningsverk.csv, respectively. An object in ores resp. concentrators can have several references.
Alternative GeoPackage:		
malmer-anrikningsverk.gpkg	GeoPackage database with geometry	
main.malmer	Table (point geometry)	Ores: Information on production at mines and mining areas as well as information on reported reserves & resources at Swedish deposits.
main.anrikningsverk	Table (point geometry)	Concentrators: Information on the amount of ore processed at concentrators and the amount of mineral concentrate produced.
main.referenser	Table (no geometry)	References: Information about references. The *code* attribute can be linked to the *code_ore_area* attribute in malmer.csv and *code_conc* in anrikningsverk.csv, respectively. An object in ores resp. concentrators can have several references.

Lineage

SGU's information on ores and concentrators has been built up over many years through digitization of data on mines, exploration results and concentrators. Most of the information is taken from the annual reports *Bergshanteringen* (for the years 1833–1977) and *Bergverksstatistik*. In addition to these, data has been obtained from *Bergmästaren's relationer* for different years and different Bergmästar districts and from publications.

For information on the division into the size of a mine / mine field in economic terms, see the section Content and structure for ores.

Information on reserves and resources comes mainly from mining and exploration companies and from exploration reports from SGU, SGAB and LKAB.

For the location of the mines, mining districts and concentrators, information on parish affiliation from the printed sources has been combined with SGU's mineral resource database and, more rarely, digital maps.

Maintenance

The product is updated twice a year when new production information from Mining Statistics or from mining companies' websites has been available and when new information about reserves and resources has been published or when other information has been found.

Quality of data

Since national compilations began to be published in 1833, the information before 1833 is sparse, fragmentary and only available for a few mines and mining areas. Furthermore, there is no information on waste rock production for the period before 1892 and systematic reporting of metal contents begins in 1909. Systematic reporting of activity at concentrators does not start until 1906. Furthermore, there is no report on concentrators for non-iron ore in Bergshanteringen in the years 1924 to 1933.

The position information is in most cases of good quality, but for a number of mines and mining areas and for a few concentrators there is no exact position other than in which parish they are located.

Content and structure

Referenser (references)

References contain information about the data sources from which data has been retrieved. The *code* attribute can be linked to the *code_ore_area* attribute in ores and *code_conc* in enrichment plants. An object in ores (Malmer) resp. concentrators (Anrikningsverk) can have several references.

CSV file or GeoPackage table: referenser (no geometry):

Field name	Content
code	Links to *code_ore_area* in malmer or *code_conc* in anrikningsverk respectively. Code is not unique and can be repeated as an object in malmer or anrikningsverk can have multiple references.
ref_short	Short version of reference
author	Author

title	Title of reference
publication	Publication series and number (where applicable)
publishing_company	Publisher
reference	Complete reference (where applicable)
year	Publishing year

Malmer (ores)

Ores contain information on production at mines and mining areas with information on the name of the mine/mining area, type of ore, years of production, amount of ore and metal contents, produced amount of waste rock and other information. Ores also contain information on reported reserves & resources at Swedish deposits with information on the type of ore, amount of ore and metal content.

CSV file or GeoPackage table: malmer (point geometry)

Field name	Content
code_ore_area	Unique ID for the deposit, mine, mining area
name_ore_area	Name of the deposit, mine, mining area
n_sweref	North coordinate in SWEREF
e_sweref	Eastern coordinate in SWEREF
date_of_update	Date of update
includes	Mines and mining fields included in the object
metal_group	Metal group, see below
metal_sub_group	Subordinate metal group, usually indicated by the chemical designation
genetic_type_of_deposit	Genetic type, see below
status	The mine and the mining area's current status
mining_method	Mining in open pits and / or underground
mining_initiated	First time the object is mentioned in the statistics (not necessarily start year)
mining_terminated	Last time the object is mentioned in the statistics

when_mined	Summary of mining periods
geological_district	Geological district in which the object is located
metallogenic_district	Metallogenetic area to which the object belongs
main_metals	Major metals, major minerals
other_metals	Accesory metals, minerals
size_category	The size of the deposit, the mine, the mining area, see below
size_category_code	Code for the size of the deposit, the mine, the mining area, see below
waste_rock_mt	Amount produced waste rock_million tonnes
resources_mt	Mineral resources_million tons
reserves_mt	Mineral reserves_million tons
production_mt	Produced amount of ore_million tons
total_tonnage_mt	The sum of resources, reserves and amount of ore produced
ag_ppm	Metal content, ppm or %
al2sio5_pc	”
as_pc	”
au_ppm	”
b_pc	”
be_ppm	”
bi_pc	”
c_pc	”
caf2_pc	”
ca_pc	”
ce_ppm	”
co_pc	”
cr_pc	”
cu_pc	”
dy_ppm	”

er_ppm	”
eu_ppm	”
fe_pc	”
ga_ppm	”
gd_ppm	”
hreo_ppm	”
ho_ppm	”
in_ppm	”
lreo_pc	”
la_ppm	”
li_pc	”
lu_ppm	”
mg_pc	”
mn_pc	”
mo_pc	”
nb_ppm	”
nd_ppm	”
ni_pc	”
pge_ppm	”
p_pc	”
pb_pc	”
pd_ppm	”
pr_ppm	”
pt_ppm	”
s_pc	”
sb_ppm	”
sc_ppm	”

se_ppm	”
sm_ppm	”
sn_pc	”
tree_pc	”
treo_pc	”
ta_ppm	”
tb_ppm	”
te_ppm	”
th_ppm	”
u_ppm	”
v_pc	”
w_pc	”
y_ppm	”
yb_ppm	”
zn_pc	”
zr_pc	”
ore_mineralogy	Ore mineralogy
ore_mineral_distribution	Distribution of ore minerals
hostrock	Host rock
country_rocks	Country rocks
age_of_mineralisation	Age of mineralisa<tion
age_of_hostrock	Age of host rocks
alteration_minerals	Alteration minerals
regional_metamorphic_grade	Regional metamorphic grade
deposit_strike	Strike of ore body
deposit_dip	Dip of ore body
deposit_plunge	Plunge of ore body

deposit_length	Length of ore body
deposit_width	Width of ore body
deposit_depth	Depth of ore body
comments	Comments

Code values metal_group:

The mines, mining areas and prospects are divided according to the main commodity.

Metal_group	Content
ferrous metals	Iron and alloy metals (Fe, Mn, Ti, V, Cr)
base metals	Base metalsr (Cu, Zn, Pb, Co, Ni m. fl.)
precious_metals	Precious metals (Au, Ag, Pt, Pd m.fl.)
special_metals	Special metals (Mo, W m.fl.)
energy_metals	Energy metals (U, Th)
industrial_minerals	Industrial minerals

Code values genetic_type_of_deposit:

The terms in this column indicate the genesis of the ores. The code list was originally established in the work with the Fennoscandian deposit database and is adapted to the mineralisations found in the Fennoscandian shield (Eilu et al, 2007).

Genetic_type_of_deposit	Content
Apatite iron ore	Ref (Eilu et al, 2007)
Black shale hosted U	”
Epigenetic Mo	”
Epithermal gold	”
Granitic pegmatite (Li, Nb-Ta, REE, Sn, Zr)	”
Iron-oxide copper-gold	”
Mafic intrusion-hosted Ti-Fe±V	”
mafic- to ultramafic-hosted Cr	”

Magmatic Ni-Cu-PGE	”
Oolitic ironstone	”
Orogenic gold (± Cu, Co)	”
Peralkaline rock-associated rare metals (Nb-Ta, REE, Zr)	“
Porphyry (Cu, Au, Mo, W, Sn, Ag)	”
sandstone fluorite	”
sandstone Pb	”
SEDEX	”
Sediment-hosted stratiform Cu	”
Skarn (Zn-Pb-Ag, Cu, Au, Fe)	”
Stratiform iron	”
Vein uranium	”
Vein-stockwork Sn, W	”
Volcanic exhalative	”

Code values and classification size_category, size_category_code:

These designations indicate the size of a mine / minefield in economic terms. By multiplying tonnage by metal content and by the metal price for a given period and summing the constituent metals in a polymetallic deposit, a value is obtained that is converted to the number of units with 100,000 tonnes of copper (Cu_eq.). This copper equivalent is then used to classify the deposit into five size ranges. A sixth interval (4_Potentially large) is used for very large but low-grade mineralizations that are hardly minable today (Eilu et al, 2007).

Cu_eq	Size_category	Size_category_code
<0,01	Showing	1
< 1	Small	2
> 1	Medium	3
-	Potentially large	4
> 6	Large	5

the 1-2 largest deposits	Very large	6

Anrikningsverk (concentrators)

Concentrators contain information on the amount of ore processed at the concentrator and the amount of mineral concentrate produced, all with metal contents. The amount of tailings produced has been calculated as the difference between the incoming ore and the outgoing mineral concentrate.

CS -file or GeoPackage table: anrikningsverk (point geometry)

Field namne	Content
code_conc	Unique ID for the concentrator (dressing plant)
name_conc	Name of the concentrator
n_sweref	North coordinate in SWEREF
e_sweref	Eastern coordinate in SWEREF
date_of_update	Date of update
processing_method	Enrichment metods
volume_m3	Volym of produced tailings_m3
density	Density of tailings
size_category	The size of the concentrator, based on incoming ore
size_category_code	Code for the size of the concentrator
associated_landfills	Associated landfills
method_for_amount_estimate	Method for estimate amount of ore, concentrate and tailings
method_for_composition_estimat	Method for estimate of composition of ore and concentrate
material	Description of the material in question; ore to concentrator, produced concentrate or tailings
recovery	Recovery of the enrichment
source_of_ore_code	Mine/mines from which the ore comes
source_of_ore_name	Code for mine/mines from which the ore comes
status	The concentrators current status
processing_initiated	First time the object is mentioned in the statistics (not necessarily start year)

processing_terminated	Last time the object is mentioned in the statistics
tonnage_t	Amount of ore, concentrate or tailings_tons
ag_ppm	Metal content in ore or concentrate, ppm or %
al2sio5_pc	”
as_pc	”
au_ppm	”
b_pc	”
be_ppm	”
bi_pc	”
c_pc	”
caf2_pc	”
ca_pc	”
ce_ppm	”
co_pc	”
cr_pc	”
cu_pc	”
dy_ppm	”
er_ppm	”
eu_ppm	”
fe_pc	”
ga_ppm	”
gd_ppm	”
hreo_ppm	”
ho_ppm	”
in_ppm	”
lreo_pc	”
la_ppm	”

li_pc	”
lu_ppm	”
mg_pc	”
mn_pc	”
mo_pc	”
nb_ppm	”
nd_ppm	”
ni_pc	”
pge_ppm	”
p_pc	”
pb_pc	”
pd_ppm	”
pr_ppm	”
pt_ppm	”
s_pc	”
sb_ppm	”
sc_ppm	”
se_ppm	”
sm_ppm	”
sn_pc	”
tree_pc	”
treo_pc	”
ta_ppm	”
tb_ppm	”
te_ppm	”
th_ppm	”
u_ppm	”

v_pc	”
w_pc	”
y_ppm	”
yb_ppm	”
zn_pc	”
zr_pc	”

References

Eilu, P., Hallberg, A., Bergman, T., Feoktistov, V., Korsakova, M., Krasotkin, S., Lampio, E., Litvinenko, V., Nurmi, P.A., Often, M., Philippov, N., Sandstad, J.S., Stromov, V. & Tontti, M. 2007. Fennoscandian Ore Deposit Database – explanatory remarks to the database. Geologian tutkimuskeskus, Tutkimusraportti – Geological Survey of Finland, Report of Investigation 168, 19 pages, 7 tables.

Revision history

List of changes of the product or product description.

List of changes

Document version	Approved	Changes
1.0	2020-12-17	Original version
1.1	2024-06-09	New license: Creative Commons CC0 1.0 Universal