Deep reflection seismic imaging of iron-oxide deposits in the Ludvika mining area of central Sweden

SND-ID: 2020-190-1. **Version**: 1. **DOI**: https://doi.org/10.5878/8gbt-cf87

Download data

Iron-oxide_deposits_Ludvika_2015-2016_mixed.segy *(3.1 MB)*

Iron-oxide_deposits_Ludvika_2016_only.segy *(1.91 MB)*

Download all files

2020-190-1-1.zip *(~5.01 MB)*

Citation

Malehmir, A. (2021) Deep reflection seismic imaging of iron-oxide deposits in the Ludvika mining area of central Sweden (Version 1) [Data set]. Uppsala University. Available at: https://doi.org/10.5878/8gbt-cf87

Creator/Principal investigator(s)

Alireza Malehmir - Uppsala University, Department of Earth Sciences

Research principal

Uppsala University - Department of Earth Sciences

Principal's reference number

775971

Description

Reflection seismic data were acquired within two field campaigns in the Blötberget, Ludvika mining area of central Sweden, for deep imaging of iron-oxide mineralization that were known to extend down to 800–850 m depth. The two surveys conducted in years 2015 and 2016, one employing a seismic landstreamer and geophones connected to wireless recorders, and another one using cabled geophones and wireless recorders, aimed to delineate the geometry and depth extent of the iron-oxide mineralization for when mining commences in the area. Even with minimal and conventional processing approaches, the merged datasets provide encouraging information about the depth continuation of the mineralized horizons and the geological setting of the study area. Multiple sets of strong reflections represent a possible continuation of the known deposits that extend approximately 300 m further down-dip than the known 850 m depth obtained from historical drilling. They show excellent correlation in shape and strength with those of the Blötberget deposits. Furthermore, several reflections in the footwall of the known mineralization can potentially be additional resources underlying the known ones. The results from these seismic surveys are encouraging for mineral exploration purposes given the good quality of the final section and fast seismic surveys employing a simple cost-effective and easily available impact-type seismic source.

The datasets consist of processed unmigrated stacked sections. One mixed file for 2015 and 2016 (see Markovic et al., 2020 and Malehmir et al., 2017) and one file for 2016 (see Markovic et al., 2020).

Data are available in SEG-Y format and can be read in 3D visualization software such as GOCAD.

Examples of free non-proprietary programs that can be used are ssView (https://sourceforge.net/projects/simple-seismic/) and SeisSee (https://seisee.software.informer.com/).

Additional data can be made available upon request. The additional data are raw shot gathers unprocessed but contains coordinates and information to process them using common seismic processing software.

These key references should be cited when reusing data:

Malehmir, A., Maries, G., Bäckström, E., Schon, M., & Marsden, P. (2017). Deep Targeting an Iron-Oxide Ore Body Using a Seismic Landstreamer and a 500-Kg Drop Hammer Source. 79th EAGE Conference and Exhibition 2017.

Bräunig, L., Buske, S., Malehmir, A., Bäckström, E., Schön, M., and Marsden, P., 2020. Seismic depth imaging of iron-oxide deposits and their host rocks in the Ludvika mining area of central Sweden. Geophysical Prospecting, 68, 24–43.

Markovic, M., Maries, G., Malehmir, A., von Ketelholdt, J., Bäckström, E., Schön, M., and Marsden, P., 2020. Deep reflection seismic imaging of iron-oxide deposits in the Ludvika mining area of central Sweden. Geophysical Prospecting, 68, 7–23.

Balestrini, F., Draganov, D., Malehmir, A., Marsden, P., and Ghose, R., 2020. Improved target illumination at Ludvika mines of Sweden through seismic-interferometric surface-wave suppression. Geophysical Prospecting, 68, 200–213.

Papadopoulou, M., Da Col, F., Mi, B., Bäckström, E., M., Marsden, P., Malehmir, A., and Socco, L. V., 2020. Surface-wave analysis for static corrections in mineral exploration: A case study from central Sweden. Geophysical Prospecting, 68, 214–231.

Malehmir, A., Maries, G., Bäckström, E., Schön, M., and Marsden, P., 2017. Developing cost-effective seismic mineral exploration methods using a landstreamer and a drophammer. Nature Scientific Reports, 7, 10325.

Maries, G., Malehmir, A., and Marsden, P., 2020. Cross-profile seismic data acquisition, imaging and modeling of iron-oxide deposits: a case study from Blötberget, south central Sweden. Geophysics, 85, B219– B233.

Data contains personal data

No

Language

English

Time period(s) investigated

2015-09-01 – 2016-10-01

Data format / data structure

3D

Geographic spread

Geographic location: Dalarna County, Ludvika Municipality

Geographic description: The study area, Blötberget in the Ludvika mining area belongs to the Bergslagen mineral district of south-central Sweden.

Responsible department/unit

Department of Earth Sciences

Funding

- Funding agency: European Union's Horizon 2020
- Funding agency's reference number: 775971

Research area

Earth and related environmental sciences (Standard för svensk indelning av forskningsämnen 2011)

Natural sciences (Standard för svensk indelning av forskningsämnen 2011)

Geology (Standard för svensk indelning av forskningsämnen 2011)

Geophysics (Standard för svensk indelning av forskningsämnen 2011)

Geoscientific information (INSPIRE topic categories)

Keywords

Mineral resources, Seismic, Exploration, Mineral, Innovation, Processing, Survey

Publications

Malehmir, A., Maries, G., Bäckström, E., Schon, M., & Marsden, P. (2017). Deep Targeting an Iron-Oxide Ore Body Using a Seismic Landstreamer and a 500-Kg Drop Hammer Source. 79th EAGE Conference and Exhibition 2017. https://doi.org/10.3997/2214-4609.201701416
DOI: https://doi.org/10.3997/2214-4609.201701416
URN: urn:nbn:se:uu:diva-326271

Braunig, L., Buske, S., Malehmir, A., Backstrom, E., Schon, M., & Marsden, P. (2020). Seismic depth imaging of iron-oxide deposits and their host rocks in the Ludvika mining area of central Sweden. Geophysical Prospecting, 68(1), 24–43. https://doi.org/10.1111/1365-2478.12836
DOI: https://doi.org/10.1111/1365-2478.12836
URN: urn:nbn:se:uu:diva-409455

Markovic, M., Maries, G., Malehmir, A., von Ketelhodt, J., Bäckström, E., Schön, M., & Marsden, P. (2020). Deep reflection seismic imaging of iron-oxide deposits in the Ludvika mining area of central Sweden. Geophysical Prospecting, 68(1), 7–23. https://doi.org/10.1111/1365-2478.12855
DOI: https://doi.org/10.1111/1365-2478.12855
URN: urn:nbn:se:uu:diva-408710

Balestrini, F., Draganov, D., Malehmir, A., Marsden, P., & Ghose, R. (2020). Improved target illumination at Ludvika mines of Sweden through seismic-interferometric surface-wave suppression. Geophysical Prospecting, 68(1), 200–213. https://doi.org/10.1111/1365-2478.12890
URN: urn:nbn:se:uu:diva-408468
DOI: https://doi.org/10.1111/1365-2478.12890

Malehmir, A., Maries, G., Bäckstrom, E., Schön, M., & Marsden, P. (2017). Developing cost-effective

seismic mineral exploration methods using a landstreamer and a drophammer. Scientific Reports, 7, Article 10325. https://doi.org/10.1038/s41598-017-10451-6
DOI: https://doi.org/10.1038/s41598-017-10451-6
URN: urn:nbn:se:uu:diva-335402

Papadopoulou, M., Col, F., Mi, B., Backstrom, E., Marsden, P., Brodic, B., Malehmir, A., & Socco, L. V. (2020). Surface-wave analysis for static corrections in mineral exploration : A case study from central Sweden. Geophysical Prospecting, 68(1), 214–231. https://doi.org/10.1111/1365-2478.12895
URN: urn:nbn:se:uu:diva-406181
DOI: https://doi.org/10.1111/1365-2478.12895

Maries, G., Malehmir, A., & Marsden, P. (n.d.). Cross-profile seismic data acquisition, imaging and modeling of iron-oxide deposits: A case study from Blötberget, south central Sweden. http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-408711
URN: urn:nbn:se:uu:diva-408711

If you have published anything based on these data, please notify us with a reference to your publication(s). If you are responsible for the catalogue entry, you can update the metadata/data description in DORIS.

Polygon (Lon/Lat)

15.052653718829, 60.126887268568

15.052653718829, 60.091470710889

15.121479034424, 60.091470710889

15.121479034424, 60.126887268568

15.052653718829, 60.126887268568

Accessibility level

Access to data through SND
Data are freely accessible

Use of data

Things to consider when using data shared through SND

Versions

Version 1. 2021-01-15

Homepage

Smart Exploration website

Contact for questions about the data

Alireza Malehmir

alireza.malehmir@geo.uu.se

Download metadata

DataCite

DDI 2.5

DDI 3.3

DCAT-AP-SE 2.0

JSON-LD

PDF

Citation (CLS)

File overview (CSV)

Published: 2021-01-15