Case 1: Fäbodtjärn Gold Project

This good practice case responds to access to data, assessment of minerals and other land uses in policy and permitting.

Minland Good Practice Stream Topic:
A) Data assessment and use in policy formulation and land use planning
C) Assessment of whether minerals and other land uses have been introduced on equal footing
D) Assessment and extent of integration between minerals and land use policies
Permitting

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Part 1: Case Overview

1.1 Executive summary

The case is about a small-scale future underground mining operation (including all aspects from prospecting, to test mining to application) that has successfully achieved a concession and is in the final application phase for an environmental permit. The case is located in the north western part of the Västerbotten County, Sweden. It is geologically part of the Skellefte mining district where currently 5 mines are in operation. The County of Västerbotten is one of two regions within Sweden with the largest experience of handling application for new mines with the last established mine in 2012. Among the local population mining has since a long time often been perceived as positive bringing jobs and representing progress for parts of society. The case describes how land use issues and conflicts are resolved and determined where exploration and mining is an integrated part of the land use system. Further, it is highlighted the importance of an early company involvement with affected stakeholders. The involvement of affected stakeholders at an early stage has defused the potential conflicts.

1.2 Overview of Key Good Practice Aspects and suggestions

Good Practice Aspect 1: Linked mining and land use policy

- Element 1: Linking of mining and land use: All components in the permitting and land use process are made for purpose and are connected. The Road to mining goes from background information including the so-called areas of national Interest. The permitting is connected also to the land use system so that the final permits are connected to the land-use planning.

- Element 2: Areas of National Interest: The tool areas of national interest which includes all types of mineral resources is one of the corner stones in the overall land use process. All sources of mineral resources are included.

- Element 3 Exploration is an activity that can take place on existing land uses and causes usually very small or no real conflict. The exploration and concession permits are handled by the Swedish Mining Inspectorate.

- Element 4 Environmental permit: This is always treated on a regional level except in cases of appeals. Therefore, larger local knowledge regarding environment and land uses such as the instrument of Areas of National Interests.

Good Practice Aspect 2: Available high quality geological information

- Element 1: Archived open exploration information: Geological information and data has been archived by the Geological Survey of Sweden, official government authority for geological matters. Within the survey one division, mining and mineral information has been particularly tasked with providing , storing and advice upon geological information. This has been perceived as a very important aspect from the industry in order to start new mining projects.

- Element 2: Active support mechanism for use of geological data: The geological data is provided to industry and also other authorities with experienced expertise provided by the geological survey.

- Element 3: Geological data and land use: The geological data is also being used for land use planning and forms the bases for determining if a deposit should be considered as an area of national interest.

Good Practice Aspect 3: Local Stakeholder interaction

- Element 1: Early involvement with stakeholders: Early and meticulous and cautions work with stakeholders has from other cases shown to be productive and has been adopted in this case.

Good Practice Aspect 4: Test mining

- Element 1: Archived open exploration information]: Geological information and data has been archived by the Geological Survey of Sweden, official government authority for geological matters. Within the survey one division, mining and mineral information has been particularly tasked with providing , storing and advice upon geological information.

- Element 2: Active support mechanism for use of geological data: The geological data is provided to industry and also other authorities with experienced expertise provided by the geological survey.

- Element 3: Geological data and land use: The geological data is also being used for land use planning and forms the bases for determining if a deposit should be considered as an area of national interest.

Good Practice Aspect 5: Exploration is an activity that can coexist with existing land uses

- Element 1 Small invasiveness: Exploration has generally a small invasiveness upon existing land uses and can be done with relatively small impact. This important since it improves upon number of exploration permits which leads to increased success rate for new mines.

- Element 2 Transparency: The exploration companies need to establish a work plan that is approved with minimum necessary impact on other land uses and affected parties. The work plan and need to be communicated with affected parties. In certain cases agreements must be established also with land owners and affected parties.

1.3 Mineral resource groups

Metals; Au (primary to case)

Aggregates – (secondary to case) in land use policy description

Industrial minerals – (secondary to case) in land use system policy description

Part 2: Case description

2.1 Case description

Development of project

The mining project is about a gold deposit located at the edge of Skellefteå mining field but also in connection of the larger so-called Gold line. There are currently two operating Gold mines within the district and two are being applied for final permits for mining. If finalised the Fäbodliden project will be developed into a small-scale mine, one of two such metal mines in Sweden in terms of size, with a few tens of employee's. Generally, acceptance for mining is high in the region. The project is localised close to one major river (nature conservation area) and within the areas of movements of reindeer herds (reindeer husbandry).

The project depicts how from available old exploration and geological information, including stored drill cores at and around the projected future mining site, the current mining and land-use policy forms a made-to
-fit mining permitting and land use system. All the different land-use aspects are weaved in different land use aspects, including the Swedish land use system with the permitting system. The case also describes how a weighted assessment of the different land uses has been conducted, and by law choose the most appropriate from the three sustainability pillars. The system has lead to the current 14 metal mines in Sweden and introduction of all mineral resources into the land use system, i.e., metals, aggregates and industrial minerals. The steps described here are about the necessary conditions for the case which connect to:

- available geological information (reuse of old data)
- the system of National Interests
- exploration permit
- mining concession permit (where the land use is partly approved for mining and the deposit is safeguarded)

- to application for environmental permit. At this final stag stage a weighted assessment of mining versus other land uses is being made.

The use the system of National Interests is being described as it is always used also in the application stages. If a deposit has been appointed as of national interest it means it gets a strong position in the land use but it will in the end be weighted against other land uses. Here what is presented from the company to the permitting authority for the Environmental permit is important. The current case has been filed for a decision at the Environmental Court but no decision is yet as of August 30, 2019, been decided.

Exploration is in this context of land use considered an activity that can take place within an appointed area for exploration, so-called area of prospecting. The case includes in addition to the description of the different stages in exploration and mining and the role of authorities including the county administrative board (CAB). The case also relates to the discussions regarding land use and minerals in the Minland Scandinavian Local Workshop in Umeå.

The project was initialised with an exploration permit, thereafter followed by a concession in 2016 after determination of mineral resource. The mineral resource has been determined according to the FRB (similar to JORC) by a Qualified Person. The project used available, public data from the SGU, as a beginning for the prospecting. Among the data were drill cores within what is now the concession area and surroundings. Currently the project has filed an application for the environmental permit which under processing by the Environmental Court. Given a positive decision mining can be commenced. For details see below.

The present case, similar to many other mining projects in Sweden, had support from mining and related policies. The authorities involved in the case have several roles – the Geological Survey of Sweden has the role from the government to support the industry and other authorities (and public) with data and guidelines regarding mining.

Similarly to other companies involved in mining in Sweden today, stakeholder involvement have been perceived as an important aspect early in the process.
Below a description of land-use issues come into play in the different stages of the mining project.

Exploration permit

The initial stage in mining is to find out whether there are minerals worth mining. The company applies for an exploration permit, which grants them solitary rights to explore the minerals. The mining licence inspectorate leaves the permit and consults the CAB in the process. The CAB informs the mining licence inspectorate about areas of national interest, protected areas etc. in the applied area. Applications for an exploration permit have a high rate of approval.

Before actual exploration work can be done a valid plan of operations (work plan) needs to exist, the validation of a work plan is a process with the holder of the exploration permit, the landowners and holders of special rights to the land.
If the exploration investigations might affect the natural environment significantly (e.g. drilling) the company should consult with the CAB, which in most cases stipulate terms for the exploration to minimize the impact on nature values. Granted exploration permits can also be seen as a test that land is made available for the mining activities.

Land use - national interests

Well known deposit which are deemed important for Sweden can be achieved a status of protection in the system of National Interests which is descried here below. This deposit is not necessarily exploited or under exploitation.

The Environmental Code contains special provisions on the management of land and water areas (Chapters 3 and 4). These provisions are designed to promote a reasonable use of natural resources in both the long and short-term from a comprehensive societal perspective. Accommodation of both preservation interests and exploitation opportunities is to be made possible. Large virgin areas of land and water, ecologically sensitive areas, and agriculture and forestry of national importance are always to be protected to the maximum extent possible. The same applies to areas of importance, e.g., for reindeer husbandry, natural beauty, cultural interest, outdoor recreation, valuable substances they contain or for purposes of national defence. These areas can also constitute national interests, in which case they must always be protected.

When an area is of national interest for several incompatible purposes, priority must be given to the purpose best conducive to long-term management of the land, except where defence interests of outstanding importance are involved. Various national governmental agencies are required to furnish particulars of areas judged to be of national interest. The Geological Survey of Sweden, for example, is responsible for the assessment of national interests in areas containing valuable substances such as minerals (i.e. mineral deposits of national interest). In addition, the Environmental Code specifies certain geographical areas that come under direct protection and are regarded as national interests for purposes of tourism and outdoor recreation. These areas are designated along the coasts, rivers and in certain mountain regions. The area protection described above, national interests included, is safeguarded insofar as palpable damage can be prevented. Measures, e.g. mineral extraction, which palpably harm a national interest are an absolute impediment to mining operations, unless the deposit in itself also constitutes a major national interest. In summary, the management provisions in the Environmental Code can be seen as a planning instrument preceding decisions on changed land use. It is also implemented and used during the permitting stages for mining.

The instrument for National Interests is a tool so that the most appropriate land use can be achieved

which in some instances is mining whereas in other cases denials have been the result of the application process. Several such denials are no up on the table of the government to decide upon as the final instance for decision after appeals.

Exploitation concession

Next step is an application for an **exploitation concession** which is granted by the Mining Inspectorate. An EIA is needed, but with focus on land-use issues. In the process the CAB is consulted and obliged to leave a statement whether the CAB approves of the application or not. The CAB must decide if mining is the best land use in the area. Central aspects of the judgement is if there are areas of national interest (NI:S) that are affected by mining practise. In the decision land use that promotes sustainable development should be given priority if there are NI:s that can´t co-exist. The system with NI:s is regulated in the environmental code, (national legislation) (Bergsstatens bedömning).

If the CAB and the Mining Inspectorate comes to different conclusions if an exploration concession should be granted or not the application must be handled by the government for final decision.
If an exploration concession is granted, the company can go on with an application for an environmental permit, either for full scale mining or for a test mine. A full EIA is needed. A test mine can be licensed before or after exploitation concession is granted. This is also the case for a full-scale mine, although the possibility is almost never used.
An application for a **test mine** is sent to and handled by the CAB. The Swedish name for the licensing authority that decides on the matter at the CAB is Miljöprövningsdelegationen (MPD). The MPD is composed of a chairman and a person with expert knowledge in the environmental matters. The chairman is a legal expert with court experience and with a special experience from environmental matters and all issues related to the environmental code. The person with expert knowledge in environmental matters has an education in the field of technology and science, and has particularly good experience in matters related to damage and detriment to human health and the environment. The MPD is a licensing authority within the CAB and not part of the authority's ordinary chain of command.
A license for a test mine is restricted in terms of the purpose of the activity. The only allowed objective for a test mine is to more thoroughly examine the properties of the ore.

Environmental permit

Environmental permit for a full-scale mine is granted by the Land and Environmental court. In the whole process of opening a new mine legal practice states that an exploitation concession states that a mining operation is permissible. This means that the object of the environmental permit is to set the conditions for the mine in terms of levels of outlets, transportation, working hours etc. In the court process the CAB represents the state and public interest.

Designation of land (access to land)

The Chief Mining Inspector together with two trustees makes decisions on designation of land needed for a mining activity if not an agreement is reached between the concession holder and the landowners and the holders of special rights. If the concession holder agrees with the landowners and the holders of special rights, land or other space shall be designated in accordance with that agreement. Insofar as an agreement has not been reached, the land or space that is needed shall be designated.

Building permit

In the last step the building permit according to the Swedish Planning and Building Act for facilities etc. is sought and usually granted since all aspects of the industrial area location has been overviewed and accepted from environmental perspective in the Environmental permit.

Mining Operations

After the mining operations start the CAB (in some cases also the municipality) supervises the operations. The supervision aims at minimizing the environmentally negative effects the mining causes. All mines are obliged to leave an annual environment report, describing how they fulfil the terms set by the environmental court.

The CAB is also supervising authority for the remediation of the mining area when the exploitation is finished. Normally the remediation is carried out by the responsible company under supervision by the CAB. The company is obliged to set up a financial guarantee so that there are resources for the remediation if the company will go bankrupt.

Development of legal practise concerning exploitation concessions

Until 2016 the CAB only assessed the impact on other interests within the applied area for an exploitation concession and did not consider the effects of the mining infrastructure necessary for full scale mining of the deposit. The positive side of this method was that the company only had to describe and make an EIA for the actual planned pit. The negative side was that when it came to the application for an environmental permit there might be unexpected terms set by the environmental court that result in difficulties in planned operations. For the CAB this process created an uncertainty concerning the total area needed for a future mine and the impacts on other forms of land-use in the vicinity. In some cases, the CAB stated that an exploitation concession was permissible, but that the CAB might change opinion when the company applied for an environmental permit, depending on what information that came in the full-scale EIA.

In February 2016 the supreme administrative court passed a ruling that states that the entire mining area, including infrastructure, must be considered in the exploitation concession process. This meant that many exploitation concession applications had to start from the beginning again, creating a

delay of several years.

2.2 Responsible institutions

- Institution 1: Geological Survey of Sweden, responsible for minerals in the National Areas of Interest and for provider of geological information.
- Institution 2: County Administrative Board of Västerbotten, responsible for environmental issues in land use planning Institution 3: Swedish Mining Inspectorate, responsible for exploration and mining concession permits.
- Institution 3: The regional Environmental Court responsible for approving or declining the Environmental permit.

2.3 Case stakeholders

- Botnia Exploration AB – The company that has submitted application for mining, industry.
- Local stakeholders – local community citizens affected by the project.
- Lycksele Municipality – land use authority at municipal level responsible for building permits and detailed land use planning
- SGU – responsible land use authority for mineral raw materials in the system for Areas of National Interest and archiver and provider of geological and geophysical information used in exploration.
- Västerbotten County Board – responsible land use authority for certain Areas of National Interest.
- Local stakeholders of the Vindelgransele village – affected by impact on land and infrastructure.

2.4 Context

An exploration target that has been first submitted for exploration permit, than for concession, and the for final permit, the so-called environmental permit. Use has been made of earlier exploration data to initiate and also part of data used in valuation of concession through JORC instrument and finally by using PERC code.

Stakeholder have been interviewed for the case and contains the whole chain from local community, municipality, land use authorities and industry.

Part 3: Case Evaluation

3.1 Impact achieved

- IMPACT 1: Achieved application for final mining permit – the application for environmental permit has been filed. This shows how the case illustrates how an integrated mining policy functions with a step-wise decision in land-use coupled to permitting can lead to a mining permit and project. The open policy for exploration allows exploration in most areas. Exploration is considered to be a activity and that after approval in permitting can occur without any significant impact on existing land-use. The permitting is coupled to the land use process further in such a way that the second step is the so-called mining concession, at that stage the concession will ”protect” the deposit and become an official land-use. The final stage in the land-use process is when the environmental permit has been filed and approved. At that stage the full land use including space for industrial facilities are endorsed and all land-use aspects are treated and will be approved including.

- IMPACT 2: Re-use of **High quality geological information** The project has made use of available geological information including previously drilled and archive drill cores at the geological survey of Sweden. Thus, exemplifying the importance of high quality geological information made available by the Geological Survey of Sweden as a driver for new exploration and mining projects. Geological information, including drill cores and geophysical measurements are being made available to exploration companies and as this case illustrates is one important driver for exploration and extraction projects.

- IMPACT 3: **Local Stakeholder interaction** The project has been able to engage stakeholders at an early stage.

3.2 Good Practice Aspects: Elements and their transferability

GOOD PRACTICE ASPECT 1: Linked mining and land use policy	
Key elements (of Good Practice Aspects)	**Suggestions for Transferability (of Key Elements)**
Element 1 Linking of mining and land use: All components in the permitting and land use process are made for purpose and are connected. The Road to mining goes from background information including the so-called areas of national Interest. After that comes the first part performed by the industry, exploration which needs an exploration permit. During the exploration, when the project is sufficiently mature a mining concession can be applied for and granted. In the final step the environmental permit is applied for which contains the within EU, necessary EIA. In each step due care is taken of the linkage to the land use system.	Mineral extraction and exploration activities are linked to the land use system. Consequences are analysed before implementation. Highly important is that active decisions by policy makers are being taken that mining activities are integrated into the land use system. This needs a high degree of cooperation between the different involved parts in the land use and permitting system. Particularly important is not only capacity within the system but also competence to formulate and execute the policy.
Element 2 Areas of National Interest: The tool areas of national interest which includes all types of mineral resources is one of the corner stones in the overall land use process. It forms the government's tool to affect the land use planning and contains eleven different categories of strategic land use aspects. The land use planning is made at municipal level. The instrument for National Interests is a tool so that the most appropriate land use can be achieved which in some instances is mining whereas in other cases denials have been the result of the application process.	Minerals is one of the key aspects of land use to be considered for land use and safeguarding. Need for mineral raw materials are at different levels from local to European scale. Therefore having a strategic tool improves possibilities for long term planning. The establishment of minerals as areas of national interest must be executed by professionals knowledgeable on mineral deposits and their valuation.
Element 3 Mining Concession: After exploration permit, which is handled by the mining inspectorate, a mining concession gives the company exclusive right to extraction and secures land for the deposit and a safeguarding for the deposit. The exploration and concession permits are handled by the Swedish Mining Inspectorate.	There must be a point in the exploration activities when land is made available for the company so that it can pull through to the final mining applications. What is important here is that enough of land is made available so that the industrial facilities for the mine also will have a place. Otherwise no mining will be achieved.
Element 4 Environmental permit: This is always treated on a regional level except in cases of appeals. Therefore, larger local knowledge regarding environment and land uses such as the instrument of Areas of National Interests.	Use of regional and local knowledge in the determination of environmental issues.

GOOD PRACTICE ASPECT 2:

Available high quality geological information

Key elements (of Good Practice Aspects)	Suggestions for Transferability (of Key Elements)
Element 1: Archived open exploration information: Geological information and data has been archived by the Geological Survey of Sweden, official government authority for geological matters. Within the survey one division, mining and mineral information has been particularly tasked with providing, storing and advice upon geological information. The information and data consists of geophysical data (gravity, magnetics, electromagnetic measurements,) base geological information including gathered data from the field. Prospecting information from exploration permits, shall also be given to the survey upon closing down of prospecting. Thus, information from these projects are saved and made available for the next exploration company increasing the possibility for success as well as adding information that is used by the academia for basic research. One important aspect of the gathered geological data is the storage of drill cores from earlier exploration drill holes. This is being done in the surveys localities at the northern Malå office. This contains today close to 19000 drill holes with more than 3 million meters of drilled core. These drill cores are made available for future studies and exploration activities. In the current project these were used together with indications of a deposit to initiate and facilitate exploration. More than 150 unique visitors days for studying and analysing these drill cores are hosted at the Malå office every year.	Availability of open geological and geophysical information including reuse of previous exploration data, like stored drill cores, and making these available ensures a sustainable use of all exploration activities as well as improves upon possibility for success. It is seen as an important factor among the European companies pushing for mining. It is also one of the factors the companies judge possibility for exploration in the yearly Frazier report on mining activities.
Element 2: Active support mechanism for use of geological data: The geological data is provided to industry and also other authorities with experienced expertise provided by the geological survey.	A support mechanism both for advice upon geological data
Element 3: Geological data and land use: The geological data is also being used for land use planning and forms the bases for determining if a deposit should be considered as an area of national interest.	High quality geological information is necessary for determining if a deposit is of sufficient value for being introduced as a part of the general land use and thus receive a form of protection in the land use system.

GOOD PRACTICE ASPECT 3:

Local Stakeholder interaction

Key elements (of Good Practice Aspects)	Suggestions for Transferability (of Key Elements)
Element 1 Early involvement with stakeholders: Early and meticulous and cautions work with stakeholders has from other cases shown to be productive and has been adopted inn this case. It is also part of the EIA presented in the application to Environmental Court. The company has had public meetings with the stakeholders as well as worked preventively with some affected reindeer herders. It has been shown from other cases that a poorly conducted stakeholder engagement has created conflicts which has been difficult to resolve therefore early and careful stakeholder contacts are necessary.	Early stakeholder contact and engagement.

GOOD PRACTICE ASPECT 4:

Test mining

Key elements (of Good Practice Aspects)	Suggestions for Transferability (of Key Elements)
Element 1 Test mining of deposit: The test mining of the deposit make it possible to: 1. Evaluate the economy of the mining because sometimes it is necessary to test procedures in the extraction, sorting and ore processing. 2. Assessment of needs to meet environmental standards. Often the extraction involves environmentally hazardous materials that must be treated correctly in order to not This can be used as a quality assessment of the process which is used in the Environmental Application to the Environmental Court.	Allow test mining during the prospecting phase however with needs to meet necessary environmental standards of course.

GOOD PRACTICE ASPECT 5:

Exploration is an activity that can coexist with existing land uses

Key elements (of Good Practice Aspects)	Suggestions for Transferability (of Key Elements)
Element 1 Small invasiveness: Exploration has generally a small invasiveness upon existing land uses and can be done with relatively small impact. The only activity that has some impact is really the drilling. This can be performed with minimum impact upon other land uses and also upon other activities and events such as nesting of threatened bird species or impact upon husbandry, reindeers and agricultural activities by choosing the time of the year for the drilling. Therefore drilling is often done during parts of the year where impact upon other parties is minimal. A open view to allow exploration has been shown to lead to success. There is in Sweden during the past ten years, in any given year somewhere between 700-1000 permits for exploration. During a ten year period one or two new mines are being established so less than a handful lead to a mine (metallic and concession minerals) so no more than about one out of a thousand permits result in a mine. Therefore, it is important to open up for exploration on large areas, otherwise the probability for success is extremely low.	Exploration can be performed in parallel with existing land uses. This improves upon possibility for successful mining. Drilling should generally be allowed if not too large impact on existing activities. Necessary that all costs for impact and mitigation of impact has been done.
Element 2 Transparency: The exploration companies need to establish a work plan that is approved with minimum necessary impact on other land uses and affected parties. The work plan and need to be communicated with affected parties. In certain cases agreements must be established also with land owners and affected parties.	Transparency of when the company is active towards the affected local parties.