



Svalbard  
Rock Vault

# Kick-off workshop

Longyearbyen, 24-26 Sept. 2018



UiO Natural History Museum



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## The Svalbard Rock Vault initiative

### Project report

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Hosted by The University Centre in Svalbard & Store Norske Spitsbergen Kulkompani AS

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*The following have been attached to this report:*

- Workshop programme with detailed timetables
- List of participants and their affiliations
- Copies of relevant submitted papers, publications and presentations
- A full economic report

## A need for a geological archive on Svalbard

National institutions around the globe are in charge of safeguarding and archiving geoscientific data and material in public archives, even after the demise of the company or institution initially acquiring it. In Norway the Geological Survey of Norway (NGU) runs and maintains a national core storage centre at Løkken in south Trøndelag and the Norwegian Petroleum Directorate (NPD) maintains an extensive core and sample storage facility from offshore wells as well as the DISKOS database of offshore geoscientific data. With NGU and NPD solely focusing on continental and offshore Norway, respectively, Svalbard falls beyond any existing framework for the storage and archiving of geoscientific data and samples. Large quantities of geoscientific data was, is and will likely continue to be acquired on Svalbard for both commercial and research purposes,

Enabled through the unique status of Svalbard granted by the Svalbard Treaty, all signatory countries of the treaty have equal rights to explore and exploit the natural resources on the archipelago. With regards to Svalbard's geological potential, these rights were mostly exercised as companies such as Store Norske Spitsbergen Kulkompani (SNSK) and Trust Arktikugol explored and exploited the coal around Spitsbergen. In addition, Svalbard has been of some interest due to its petroleum potential, as indicated by the 18 wildcat exploration wells drilled in search of hydrocarbons. Although in effect being the first-drilled petroleum province of Norway, a significant portion of these data sets have been lost or are kept hidden away from public reach. Without the accessibility and availability of Svalbard-related data and samples, academic, commercial and public efforts of exploration and exploitation are likely to lead to economic losses and an increased environmental footprint as data sets have to be re-acquired.

In order to provide an overview of the whereabouts of past, present and future data, we proposed the Svalbard Rock Vault initiative. As part of the Svalbard Rock Vault initiative we aim to firstly facilitate long-term collaboration between Svalbard-based, Norway-based and international researchers and institutions with respect to developing a comprehensive geological material archive on Svalbard. Secondly, the initiative aims to involve the cataloguing of relevant data sets and data types held by partner-institutions and identify to what extent these can be shared in a common platform. This common platform is to become a base for future research and educational projects and should include all geoscientific data originating from Svalbard, or at the very least include references to the whereabouts thereof.

### The Svalbard Rock Vault initiative: a kick-off meeting

To launch this initiative, the University Centre in Svalbard (UNIS) and SNSK co-hosted the kick-off workshop of the Svalbard Rock Vault initiative in Longyearbyen, 24-26 September 2018. In total, 33 participants representing 19 different institutions were present (Appendix B). These include Norwegian mainland institutions like the Geological Survey of Norway (NGU), the Norwegian Polar Institute (NPI), Norsk Polar Navigasjon AS (NPN), Equinor AS, Svalbard-based institutions and operators such as UNIS and SNSK, and The Directorate of Mining with the Commissioner of Mines on Svalbard (DMF) in addition to European institutions with significant archives of Svalbard-related material like the Sedgwick Museum of Earth Sciences; all of which are either historically or currently related to the acquisition of geoscientific data onshore Svalbard.

Those participating provided key advice not only on how each of them pictured the future and responsibilities of a geoscientific archive on Svalbard, but also led to an increased understanding on the whereabouts of important data sets. The Svalbard Rock Vault has already succeeded by enabling the re-discovery of Svalbard-related geoscientific material simply by putting relevant people in direct contact. These data include the cores drilled in Gipsdalen in the 1970s and the transfer of the entire NPN archive to the more suitable and accessible storage facility at UNIS. The latter is of importance not only due to the vast amount of data that has become available, but rather as an example of how a future geo-archive on Svalbard could function to save data and samples from being lost. As emphasised during the workshop, local systems are unlikely to overcome the collapse of a company or loss of responsible personnel due to a lack of archive-redundancy. For all participating institutions, including those based on Svalbard, there remains a significant risk of losing geoscientific material as a result of downscaling of operations, relocation, and other unforeseeable events.

On Svalbard, the decrease in coal-mining related activities has the greatest potential to result in a loss of Svalbard-related material. Without an existing framework in place, uncertainty exists over the fate of hundreds

of SNSK cores currently stored in Svea and Endalen after the decline of mining on the archipelago. The recently announced closure of Svea highlights the issue at hand further, and stresses the need for a timely solution before loss of material becomes inevitable.

### Recommendations from the Svalbard Rock Vault kick-off meeting

Acknowledging the need for immediate action, three recommendations were formulated during the workshop:

**Recommendation 1:** The Svalbard Rock Vault initiative was seen as an important initiative by all participants. A follow-up project working on the details regarding organizational structure, financing models and data access and contribution is needed.

**Recommendation 2:** The physical geological material owned by SNSK and UNIS is of high international scientific value and should be made easily available. This includes short-term improvements to the Endalen facility or relocation to another location in Longyearbyen. Financing should be sought for this. Such a facility should also be established with expansion in mind to store material arising from future new data acquisition, for instance a stratigraphic drilling project.

**Recommendation 3:** A large amount of geoscientific material and data was collected on Svalbard in the past and will be collected in the future. It is imperative that this material is known and can be used in R&D activity. We propose to lobby for a Svalbard-based Geodata manager to initiate such a catalogue, in close collaboration with other data repositories including Svalbard-related data.

It is important to note that while all participants were positive of the initiative, there was no consensus on which institution should be granted curator or data manager status to oversee the project. All parties, however, agreed that this role should be held by a Svalbard-based institution, and with the current oversight on the NPN archive and as co-host of the Svalbard Rock Vault initiative UNIS remains a likely candidate.

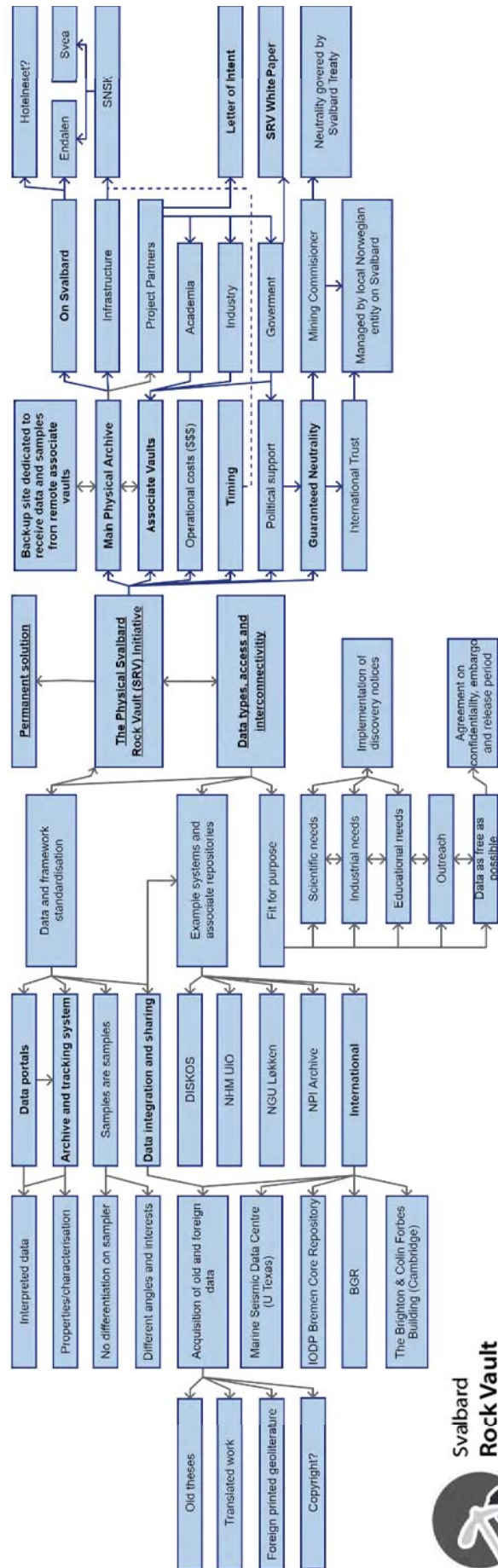
Figure 1: (Diagram) Connecting the dots with regards to samples, data, financing and management of operations. Per the discussion, time is quickly running out as we are approaching the end of an era with the closure of Svea.



Figure 2: Break-out session and panel debate participants at the Svalbard Rock Vault kick-off meeting, 24-26 September 2018, Longyearbyen, Svalbard.



Figure 3: Visit to the SNSK core storage facility in Endalen, a possible future location of the physical Svalbard Rock Vault archive.





Agreement on these recommendations would not have been possible without the combined power of the 19 institutions involved, and the willingness to work together to further outline the direction and activities related to the Svalbard Rock Vault initiative.

Following partner-presented state of the archive addresses (Monday, Tuesday, see Appendix A), in which the full extent of local repositories and the archival system thereof were addressed, two break-out sessions (Wednesday) sought to find and implement solutions to the main themes of 1. *data types, data access and links to existing archives and databases* and 2. *the organizational form, financing and management of the Svalbard Rock Vault*. In addition to these main themes, four related questions referred to as *the Svalbard Rock Vault Questionnaire* (Figure 4) were distributed amongst all participants to aid in the discussions. Schematically depicted in Figure 1, a clear distinction is observed between the hard (i.e., physical rock vault) and soft (i.e., back- and front-end (digital) archive framework) elements of the initiative as summarised during the break-out sessions. Each is further divided in various subcategories and challenges.

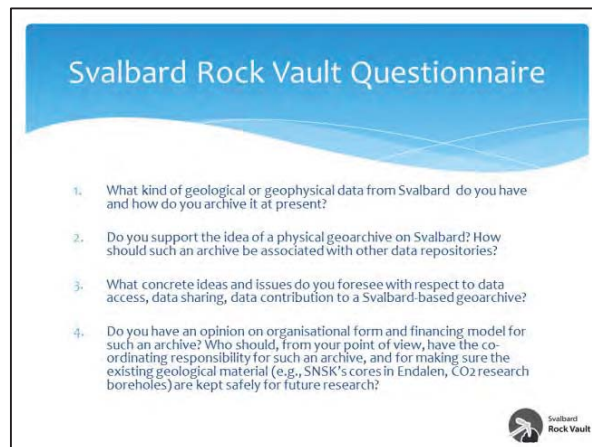
Some of these featured more prominently than others in the panel debate (Figure 5) that followed, but a select few were addressed repeatedly by the panel that consisted of representatives of NGU, NPI, DMF and CEED. *Timing, neutrality, accessibility and a permanent solution* are considered of the essence to the early-to-midterm viability of the initiative, and these points should be emphasised alongside the recommendations outlined prior.

### Anticipated significance and benefits

Such an overview would not have been possible without physically coming together and sharing the current status of remote Svalbard-related archives. In addition, the field visit to Mine 7 and SNSK's core storage facility in Endalen illustrated the Arctic flexibility needed to run successful operations in this remote region. These visits also provided a hands-on experience on the scale of the challenge at hand, and at the same time being a key example of why such an initiative is so drastically needed.

The Svalbard Rock Vault kick-off meeting can thus be seen as the catalyser in a much bigger process, a process which only now is starting to bear fruit. All initial partners have agreed on the need for an initiative to archive, protect and make available the unique geological material and data that has already been acquired, is acquired as we speak, and material that has yet to be acquired in the near and remote future on Svalbard.

Such an initiative, of which the details are depicted in Figure 1, requires not only a physical storage facility on Svalbard, but also requires a framework that guarantees the neutrality, accessibility and standardisation of the archive and its data. The biggest benefits include reproducibility of results and the implementation of redundancy-factors to prevent the loss of local geoscientific data for good.



**Figure 4: The Svalbard Rock Vault Questionnaire as distributed to all participants. All participants were asked to submit their answers prior to the break-out sessions. These were later used to steer the panel discussion and as input on the way forward.**



**Figure 5: The First Svalbard Rock Vault panel debate, with the Svalbard Rock Vault Questionnaire highlighted in the back, see also Figure 4. From left to right: Peter Brugmans (DMF), Sverre Planke (CEED), Tom Heldal (NGU), Synnøve Elvevold (NPI).**

These benefits, however, are distinct from the most significant challenge at hand: locating and protecting the vast archive of Svalbard's historical geoscientific data both locally and abroad. Agreement is therefore not only needed on the operational level, but also on the political level. Such agreement and awareness is currently lacking at the decision making level, and all initial partners have agreed to raise awareness within their respective organisations and institutions. Only then, by including the political level in the discussions, can a modern-day Svalbard Rock Vault be established on Svalbard that implements both the physical and digital aspects needed to make the Svalbard Rock Vault initiative a success and leading infrastructure backbone for all global Svalbard-related geoscientific archives.

### Svalbard Rock Vault action points

Meanwhile, the Svalbard Rock Vault has resulted in a number of action points that should become part of future SSF project requirements and improve upon knowledge of the whereabouts and properties of samples and data sets. These action points are stop-gap measures which should eventually become part of the Svalbard Rock Vault framework, and require the creation of a back- and front-end archive framework for physical samples, i.e., the RiS TracerID:

1. Similar to the registration of meta-data and data sets on RiS, physical samples should be registered alongside one or multiple photos, a description of the sample and sampling location (preferably including GPS coordinates) and current overseer (i.e., up-to-date contact details) and location of the sample. In return, each sample gets a 'RiS TracerID' that should be stored alongside the sample and links to the RiS TracerID sample-page.
2. For all Svalbard-related samples featuring in publications a reference should be included to the RiS TracerID, allowing for pinpointing of the sampling locality and the sample's current location to enable scientific verification of results and the prevention of material loss.
3. The sample's RiS TracerID page should be continuously updated to reflect current whereabouts and ownership, and to include further experiments conducted on the sample following the initial registration.

These action points would prevent the further fragmentation of whereabouts of Svalbard-related samples and are a natural next step in the archive system that is to become part of the Svalbard Rock Vault.

### RockVault2020: the way forward

With the openness and accessibility requirements in mind that we set for the Svalbard Rock Vault, it is only natural to make the initiative itself a common and shared process as well. Workshop presentations and results are currently being made available to the wider audience, transcripts and summaries have been shared with relevant media (e.g. Svalbardposten), the Norway's geological community (e.g. through [geoforskning.no](http://geoforskning.no), [geo365.no](http://geo365.no)) and with prospective project partners (e.g., SSF representative meeting). Draft and submitted versions hereof have been attached to this report, and can be found in Appendix C.

The Svalbard Rock Vault project is aligned with SSF's strategy focussing on *open sharing of data, large-scale collaboration* and results in *enhanced (inter)national and inter-disciplinary cooperation with immediate relevance for research on Svalbard*. Finally, by incorporating new technologies and proper archive systems, this project is likely to *reduce the environmental footprint* as for example renewed drilling becomes unneeded due to the accessibility of previously obtained material.

The vision underlying the Svalbard Rock Vault initiative is central to a Svalbard Strategic Grant proposal that has been submitted to the Norwegian Research Council in October 2018 to continue the initiative as a pilot project for 2019-2020 (RockVault2020). Consisting of three work packages (WP1-3), RockVault2020 seeks to implement the scientific recommendations and action points outlined in this paper through the close collaboration of UNIS, SNSK, DMF, NPI, NGU, NPD, academia and industry.

Although the need for a white paper has been discussed as part of the kick-off meeting, a political-level white paper has been deemed too premature at this stage. It is, however, more suitable as a follow-up to the RockVault2020 project, combined with a letter of intent signed by all participating institutions.

## Concluding remarks

Meanwhile, the initiatives outlined in this report will hopefully attract the political willingness and funding required to make both the physical structure and the digital e-infrastructure of the Svalbard Rock Vault a reality. In parallel, local efforts are being made to locate, relocate and characterise Svalbard-related geoscientific data, and integrate them with the Svalbard Rock Vault infrastructure. The potential of future results is best illustrated by the example of the NPN archive. In its few weeks at UNIS, the archive has already led to a vast repository of data being made available to the Arctic Geology Department at UNIS and partners, of which the data are likely to feature in at least one academic article and master's thesis. In addition, the NPN archive features heavily in the proposed RockVault2020 WP2. This potential is only to increase as remote repositories and archives become increasingly integrated to the Svalbard Rock Vault backbone, and the whereabouts of Svalbard-related geoscientific data are rediscovered and shared with the greater academic, industrial and public community alike.



**Figure 6: Svalbard Rock Vault initiative partners and participants visiting Gruve 7 during the Svalbard Rock Vault kick-off meeting in Longyearbyen, 24-26 September 2018.**

## Workshop agenda

### Monday 24 September 2018

14:00-15:00 Arrival, registration and light refreshments.

### Monday 24 September 2018 15:00-18:00

15:00-15:20 Welcome and introduction to the workshop idea by hosts and co-chairs: Kim Senger, Malte Jochmann

15:20-15:30 Welcome and introduction to UNIS by director of HSE and Infrastructure at UNIS, Fred Skancke Hansen

15:30-15:40 Welcome and introduction to SNSK by director of SNSK, Jan Morten Ertsaas

15:40-16:10 The Svalbard Treaty and its implications for resource management – Peter Brugmans (DMF med Bergmesteren på Svalbard)

16:10-16:30 Break - coffee refill and refreshments

16:30-16:50 Coal exploration: paving the way for groundbreaking research, Malte Jochmann (SNSK)

16:50-17:10 Drilling the Permian-Triassic boundary: insights from the Deltadalen boreholes, Sverre Planke (CEED)

17:10-17:30 Drilling for knowledge: the Longyearbyen CO<sub>2</sub> lab project, Kim Senger (UNIS)

17:30-18:00 Petroleum exploration onshore Svalbard. An industrial perspective, Arvid Nøttvedt (NORCE)

19:00-00:00 Workshop dinner in the UNIS canteen

### Tuesday 25 September 2018 09:00-17:00

09:00-09:10 Brief summary of day 1 by workshop organisers

09:10-09:20 Svalbard Science Forum priorities, the Research-in-Svalbard database and international co-operation, Karoline Bælum (SSF)

#### 09:20-11:00 Presentations by project participants

09:20-09:40 Exploration activity and geological archive, Peter Brugmans and Ingeborg Solberg (DMF med Bergmesteren på Svalbard)

09:40-10:00 Geological mapping of the Svalbard archipelago, Synnøve Elvevold (NPI)

10:00-10:20 Core and sample storage, mainland Norway, Rolf Lynum and Tom Heldal (NGU)

10:20-10:40 Core and data storage, Norwegian Continental Shelf (NPD; *TBC*)

10:40-11:00 Geological data archiving and importance for verifiability of scientific results, Hans Arne Nakrem (NHM Oslo)

11:15-14:15 Field excursion to Endalen and Longyearbyen CO<sub>2</sub> lab site – in the Arctic Tapas bus.

#### 14:30-16:10 Presentations by key project participants (cont'd)

14:30-14:50 Academic perspective on geo-archive on Svalbard, Lisa Watson (UiS)

14:50-15:20 Legacy of Brian Harland collection, Simon Kelly (Sedgwick Museum)

15:20-15:40 German research activity onshore circum-Arctic, Karsten Piepjohn (BGR)

15:40-16:00 Break - coffee refill and refreshments

16:00-16:20 A coal company in change: overview on material and data, Malte Jochmann (SNSK)

16:20-16:40 Russian activity on Svalbard, Mikhael Milovslavskij (PMGE)



16:40-17:00 The 1976 Ny Ålesund diamond drilling campaign, the use of the core material, and the story on how they were lost, Peter Midbøe

19:00-00:00 Workshop dinner at Stationen

**Wednesday 26 September 2018 08:30-11:30**

08:30-09:00 Wrap up including data types and input from participants, targeting the following topics:

- a. Rock samples – what, where, who and how
- b. Drill core samples – current
- c. Wireline data
- d. Seismic data
- e. Integration possibilities and systems (e.g. Svalbox developed at UNIS)
- f. Data sharing and e-infrastructure.
- g. Data types – what is available and what is relevant

09:00-9:45 Group workshops, focusing on road map ahead and “statement of intent”

- a. Svalbard Rock Vault: organizational form, financing and who should be in charge
- b. Data types, data access and links to existing archives and databases

9:45-10:00 Break - coffee refill and refreshments

10:00-10:45 Panel debate

- a. Address comments from group workshops
- b. Way forward
- c. Statement of intent

10:45-10:50 Conclusions and way forward by the workshop organisers

11:00-11:30 Lunch seminar by Jim Ogg on the Geological Time Scale

**11:35 Norwegian shuttle departure to Svalbard Airport**

**12:20 SAS shuttle departure to Svalbard Airport**

## Svalbard Rock Vault Kick-Off Meeting Participant List

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