



## NORWEGIAN OFFSHORE DIRECTORATE

# **Guidelines for regulations relating to materials and documentation in connection with surveys for and utilisation of subsea reservoirs on the continental shelf to store CO<sub>2</sub>**

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## 1 Introduction

The Regulations relating to materials and documentation in connection with surveys for and utilisation of subsea reservoirs on the continental shelf to store CO<sub>2</sub> (Regulations relating to documentation for CO<sub>2</sub> storage on the shelf) have a legal basis in the Act relating to petroleum activities and the Act relating to scientific research and exploration for and exploitation of subsea natural resources other than petroleum resources and mineral deposits with associated regulations. These Regulations establish provisions concerning the licensee's obligations as regards data acquisition and documentation, as well as reporting to the authorities. They also govern aspects associated with conducting geophysical surveys.

Several of the provisions in the Regulations relating to documentation for CO<sub>2</sub> storage on the shelf have parallel provisions in the Resource Management Regulations. The provisions must, insofar as appropriate, be understood and practised in the same manner as is presumed within petroleum administration.

These Guidelines provide extensive comments on the individual provisions of the Regulations relating to documentation for CO<sub>2</sub> storage on the shelf. As of 1 January 2023, these Guidelines replace the comments on the Regulations which were previously included as part of the Regulations relating to documentation for CO<sub>2</sub> storage on the shelf. The Guidelines are structured in the same manner as the previous comments, as each individual provision is addressed.

There are also separate guidelines for certain topics under the Regulations relating to documentation for CO<sub>2</sub> storage on the shelf, which can be found at Norwegian Offshore Directorate [Regulations - The Norwegian Offshore Directorate \(sodir.no\)](https://sodir.no).

The Guidelines indicate how to fulfil the requirements in the Regulations relating to documentation for CO<sub>2</sub> storage on the shelf. If format requirements are stated, they will be binding pursuant to Section 4 of the Regulations relating to documentation for CO<sub>2</sub> storage on the shelf. This means that the information must be submitted/made available in the indicated manner.

## 2 Re Chapter 1. Introductory provisions

### Re Section 1. *Objective*

"Geophysical survey" means a survey conducted to procure geophysical data e.g., seismic, electromagnetic, gravimetric and magnetic data.

### Re Section 2. *Scope*

This provision clarifies that the Regulation applies for both CO<sub>2</sub> storage as part of petroleum activities and for CO<sub>2</sub> storage outside petroleum activities.

### Re Section 4. *Format and units of measurement*

Clearly identified e.g., means using the Norwegian Offshore Directorate's unique identification codes (NPDID) and designations for discoveries and wells.

### **Re Section 5. *Responsibilities pursuant to these Regulations***

This provision must be read in context with Section 11-8 of the Regulations relating to storage and transport of CO<sub>2</sub> on the shelf regarding the duty to comply with the Regulations and to ensure that provisions are observed, Section 10-6 of the Petroleum Act regarding the duty to comply with the Act and to ensure that the provisions are observed, as well as Sections 56, 57 and 58 of the Petroleum Regulations regarding management systems. Please note that the first subsection entails a material duty to comply with the regulatory provisions, as well as a duty to do this by implementing necessary systematic measures.

## **3 Re Chapter 2. Surveys**

The provisions regarding survey activity in these Regulations must be read in context with provisions laid down in Chapter 2 of the Regulations relating to storage and transport of CO<sub>2</sub> on the shelf, Chapter 2 of the Petroleum Act, as well as Chapter 2 of the Petroleum Regulations.

Applications for and payment of fees for survey licence and payment of fees for each individual seismic survey must be submitted to the Norwegian Offshore Directorate, cf. Section 2-5 of the Regulations relating to storage and transport of CO<sub>2</sub> on the shelf and Sections 3, 5 and 9 of the Petroleum Regulations.

The provisions in this chapter apply for survey activity pursuant to a survey licence, exploration licence, exploitation licence, specific licence to install and operate facilities (PIO) and production licence (if the survey is conducted as part of petroleum activities).

If the survey involves drilling deeper than 200 metres, consent must be obtained from the Norwegian Ocean Industry Authority in addition to registering the borehole with the Norwegian Offshore Directorate, cf. Section 25 of Regulation No. 1797 of 18 December 2015 relating to management and the duty to provide information in the petroleum activities and at certain onshore facilities (the Management Regulations).

Equipment testing is not covered by the Regulations.

### **Re Section 6. *Notification in connection with surveys***

This provision complements Section 2-6 of the Regulations relating to storage and transport of CO<sub>2</sub> on the shelf and Section 6 of the Petroleum Regulations as regards what information to submit in connection with survey activity.

The requirement to report the names of vessels applies for all vessels involved in the survey.

When surveys are reported, the licensee must report the survey pursuant to the licence in question. When the licensees also conduct a survey beyond their own licence in open areas, both licences must be stated.

Survey activity which comprises seismic surveys is considered to start when the source is activated.

Temporary suspensions pursuant to the fifth subsection do not need to be reported in the event of brief position changes.

The Norwegian Offshore Directorate's reporting system for surveys can be found at [sodir.no](http://sodir.no).

### **Re Section 8. Requirements for conducting seismic surveys**

Gradual start-up of the audio source (soft start) entails that the audio source starts at low power and gradually increases until full power is achieved (usually within 20 minutes).

Site surveys are one example of surveys where the conditions for deviating from the soft start requirement are satisfied, because it is not technically feasible to regulate the audio volume.

Section 2-6 of the Regulations relating to storage and transport of CO<sub>2</sub> on the shelf and Section 6 of the Petroleum Regulations contain provisions aiming to prevent potential conflicts of interest. If there is no fishery activity in the relevant area during the time period in question, the seismic vessel may start its activity. As long as the vessel has its cables deployed, it is considered to be a vessel with "limited ability to manoeuvre", cf. Rule 3 (g) of Regulation No. 5 of 12 December 1975 relating to preventing collisions at sea (Rules of the Road at Sea). Should a fishing vessel appear in such a situation, it must yield for the seismic vessel pursuant to Rule 18 (c) of the [Rules of the Road at Sea](#). Pursuant to the so-called *lex specialis* principle, the [Rules of the Road at Sea](#) supersede the general yield provision in these Regulations Section 8 as regards the seismic vessel's duty to maintain prudent distance to vessels conducting fishery activity.

### **Re Section 8a. Escort vessel for geophysical surveys**

The fisheries expert must communicate with fishing vessels in the area.

The requirement for escort vessels to play a "passive role" entails that the escort vessel can only contact other vessels in the area in special circumstances. This could e.g. become relevant if a vessel maintains a course or makes a manoeuvre that is not compatible with safe navigation, and there are grounds to presume that this may cause harm to personnel, vessels, equipment or tools. It is a prerequisite that other available channels of communication have been attempted before the escort vessel is used as a means to avert harm.

### **Re Section 9. Requirement to have a fisheries expert on board vessels conducting seismic surveys**

According to the provision, "*relevant regulations, documents and data shall be made available to the fisheries expert*". This also means the licensee's survey or exploration licence, or exploitation or production licence, and any decisions made in connection with the specific survey, including conditions and advice given in connection with the activity.

### **Re Section 10. Position reporting in connection with geophysical surveys**

The Directorate of Fisheries' 24/7 Fisheries Monitoring Centre (FMC) is the point of contact for technical and practical information regarding installation and use of position reporting equipment.

### **Re Section 11. *Requirements for fisheries experts on board vessels conducting geophysical surveys***

Changed certificate requirements will apply for participation in courses starting from when the Regulations enter into force.

"Equivalent relevant experience" in the second subsection means documented experience with fisheries inspection at sea.

A manual for fisheries experts can be found at [sodir.no](http://sodir.no).

### **Re Section 12. *Route surveys and other subsurface surveys***

Section 12 is a special rule that makes certain exceptions from the general duty to report provision in Section 6. The first subsection clarifies the main rule that route and other subsurface surveys shall also be reported through the Norwegian Offshore Directorate's reporting system, cf. Section 6.

The second subsection governs when exceptions can be made from the duty to report for certain types of route and other subsurface surveys. The intent of the duty to report is to ensure cooperation at sea by weighing petroleum interests against the consideration for fish and marine animals, vulnerable areas and marine commercial interests. An exception from the duty to report will be relevant if the survey activity is presumed to have no, or very limited, impact on such interests. In general, this could be the case if the activity involves little audio volume and covers a limited area and a limited time interval. If the requirements in the second subsection are satisfied, the route/subsurface survey will not be subject to the duty to report. If one or more of these requirements remains unsatisfied, the duty to report will apply. Should there be a desire to exempt a reportable survey from the duty to report, an application for dispensation must be submitted to the Norwegian Offshore Directorate. The exception will e.g. comprise mapping with hull-mounted or ROV-mounted equipment, such as cameras, video cameras, multibeam echo sounders, penetrating echo sounders, sonar, side scan sonar, magnetometers and acoustic or electromagnetic pipe locators.

## **4 Re Chapter 3. Drilling and well activity, etc.**

### **Re Section 13. *Registration of wells, permits for exploration drilling and drilling programme***

Information regarding what information shall be submitted can be found on the Norwegian Offshore Directorate's website, [sodir.no](http://sodir.no).

The Norwegian Offshore Directorate's system for well/wellbore designation and classification is described in separate topical guidelines and can be found on the Norwegian Offshore Directorate's website.

As regards the geoscience content of the drilling programme, reference is made to NORSOK standard D-010 Drilling and well operations, revision 4.

The programme shall include the following information for exploration wells and injection wells with exploration targets:

- Well information: relevant licence, licensees, well designation, drilling rig (name, owner water depth, drill floor/Rotary Kelly Bushing (RKB) etc.), geographical coordinates, brief licence history.
- Geological background: regional geological placement, maps with scale and geographical coordinates for the relevant licence, with outlines of the expected storage complex and well placement, lithological column with depths, formations and explanatory text, pressure, temperature.
- Description of expected storage complex: map (time and depth), geological description, velocities, crossing seismic lines through the well and at least one geoseismic section.
- Data acquisition: type and recipient (incl. the Norwegian Offshore Directorate), criteria (for e.g., coring, WL), table with planned formation evaluation.
- Organisation chart with positions, telephone numbers and e-mail addresses.

#### **Re Section 16. *Technical geological and reservoir data acquisition in connection with drilling and well activity***

When the provision uses the term "should" in connection with data acquisition, the licensee shall have a dialogue with the Norwegian Offshore Directorate to clarify the scope of this data acquisition.

The first sentence of litra b) stipulates that drill cuttings samples shall be taken from all types of rock from all geological formations in the reservoir interval in a representative selection of the injection wells and observation wells. There shall be a dialogue with the Norwegian Offshore Directorate as regards which wells are considered to be representative for CO<sub>2</sub> storage in the given storage complex.

The second sentence of litra e) stipulates that cores should be taken from potential cap rocks. This means the cap rocks that may be significant for the safety of the CO<sub>2</sub> storage. Dialogue is expected to take place with the Norwegian Offshore Directorate regarding the selection.

Litra j) stipulates that the strength of the relevant cap rocks must be tested. Relevant means the cap rocks that may be significant for the safety of the CO<sub>2</sub> storage, and dialogue with the Norwegian Offshore Directorate is presumed as regards the selection. One method for calculating the strength is to perform geotechnical analyses on cores from the cap rock. Another method is to test the cap rock in the borehole without extracting a core, by measuring the pressure needed to fracture the cap rock. This type of test is most frequently called a leak-off test. The Norwegian Offshore Directorate shall receive data from any and all tests conducted.

#### **Re Section 17. *Information about formation test***

Information about formation tests shall comprise the following:

- The purpose of and how the test will take place
- Duration of periods with flow and shut-in
- Assessment of environmental impacts
- Planned extraction and analysis of formation fluid



- Preliminary log evaluation (Computer Processed Interpretations (CPI)) in measured depth (MD) and true vertical depth (TVD) from the reservoir in 1:500 scale

### **Re Section 18. *Reporting during drilling and well activity***

Reporting pursuant to this provision shall take place to the Norwegian Offshore Directorate's and the Norwegian Ocean Industry Authority Norway's drilling database DDRS in accordance with the format and in the manner described in the DDRS user guide, see [sodir.no](https://sodir.no) and [havtil.no](https://havtil.no).

Reporting during the well's lifetime will take place from when the drilling operation starts up and until the well is permanently plugged.

### **Re Section 20. *Designation of permanently placed facilities***

"Permanently placed" means both mobile facilities that are permanently placed and bottom-fixed facilities.

### **Re Section 22. *Information concerning material changes***

Should material changes arise in connection with drilling and well activity after documentation has been submitted, the Norwegian Offshore Directorate shall be informed about this as soon as possible. Material changes could be incidents in connection with implementing planned activity that leads to e.g. sidetracks, not possible to implement planned data acquisition, etc.

## **5 Re Chapter 4. Submitting materials and documentation**

Section 11-7 of the CO<sub>2</sub> Storage Regulations stipulates that material and information that the licensee, operator, contractor, etc., has or is preparing in relation to planning and implementation of transport, injection and storage of CO<sub>2</sub> shall be available, and the authorities may demand that this be submitted. The provision also stipulates that this submission shall take place in the format decided by the Ministry, to the extent that this is found to be reasonable. Based on this provision, the Regulations relating to documentation for CO<sub>2</sub> storage on the shelf stipulate which materials and information shall be submitted and made available to the Norwegian Offshore Directorate. Format requirements for materials and documentation may be stipulated by the Norwegian Offshore Directorate cf. Section 4 of the Regulations relating to documentation for CO<sub>2</sub> storage on the shelf. Guidelines and specifications concerning this can be found at [sodir.no](https://sodir.no).

The guidelines indicate which types of materials and documentation shall be submitted to Diskos. Diskos is the Norwegian Offshore Directorate's national data repository for exploration and production-related information from the Norwegian shelf and an archive for certain types of data. Members of the Diskos Partnership have access to all public data in the database, as well as data they own themselves. For non-members, there is a public portal with an index of all available public data. This data can be requested from Diskos' database operator at the cost of an administration fee.

### **Re Section 24. *Geophysical data***

This provision complements the provisions in Section 2-6 of the Regulations relating to documentation for CO<sub>2</sub> storage on the shelf and Section 6 of the Petroleum Regulations if the acquisition of data takes place as part of petroleum activities.

Materials and documentation mentioned in litra a through c of the first subsection shall be submitted to Diskos in accordance with the Guidelines for reporting geophysical data ("yellow book").

Materials and information mentioned in this provision's first subsection litra d shall be submitted to the Norwegian Offshore Directorate.

The Norwegian Offshore Directorate may, upon application, provide dispensations from the routine reporting requirements, cf. Section 35 of these Regulations. A potential exemption from the reporting requirement will be contingent on field data and pre-stack data being satisfactorily stored and easily available for everyone requesting access to the data, and the data must also derive from commercially available surveys. If the dispensation requirements are subsequently discontinued, the data shall be submitted.

Marketable data will be data collected for the sole purpose of making the data available for sale to a third party. It is a prerequisite that the data is marketable from when they are available to the owner. This means that the data must be available to everyone at market price from when they are available to the owner and prepared for use. Data acquired for internal use in one or more production licences is not considered to be marketable.

Licensees that normally do not conduct surveys with the intent of reselling the data must document their basis for requesting that a survey is classified as marketable, while simultaneously submitting data pursuant to Section 6 (8) of the Regulations relating to documentation for CO<sub>2</sub> storage on the shelf, potentially pursuant to Section 6 (5) of the Petroleum Regulations.

Pursuant to this provision, licensees are obliged to submit data that are processed further after routine processing. Continuous adjustments of merges in connection with geophysical work where no material changes are made in the nature of the sub-components shall not be submitted. If a merge is adjusted pre-stack, this shall be submitted.

### **Re Section 25. *Interpreted geophysical data***

Interpreted geophysical data is not subject to mandatory reporting pursuant to this Section, but the Norwegian Offshore Directorate may, through individual administrative decision, require that such data be submitted.

Materials and documentation mentioned in this provision shall be submitted to Diskos in accordance with the Guidelines for reporting geophysical data ("yellow book"). This can be found on the Norwegian Offshore Directorate's website, [sodir.no](http://sodir.no).

As regards the distinction between interpreted and non-interpreted data, reference is made to the guidelines for interpreted data at [sodir.no](http://sodir.no), which define which data are interpreted data. The following is presumed: "Interpreted data means products that are the result of a discretionary professional assessment, and which are of sufficient quality to potentially form a basis for decisions in the production licence. Processed geophysical data, measured well data or visualisations thereof are not considered to be interpreted data".

**Re Section 26. *Geo-technical materials and documentation from exploration licences and exploitation licences in the event of relinquishment, surrender, lapse and expiry***

The Norwegian Offshore Directorate's Guidelines for status reports for surrender, lapse or expiration of a production licence can be found at [sodir.no](http://sodir.no). They were prepared for the petroleum activities but apply equivalently for CCS activities insofar as appropriate. Dialogue with the Norwegian Offshore Directorate is encouraged.

The provision in the second sentence of the first subsection refers to the fact that the report e.g. aims to provide an overview of potential prospects in the exploration licence or exploitation licence. Prospects should describe potential identified storage complexes with designation of e.g. acquired data, assessments of storage capacity and risk of leaks.

"Geo-technical materials and documentation" will comprise both well data and geophysical data.

**Re Section 27. *Information about changes in rights to reported data***

Information regarding changes in rights to reported data shall be submitted to Diskos.

The objective of this provision is to ensure that the authorities have up-to-date information about who is entitled to data at any given time.

**Re Section 28. *Submitting samples and preparations from wells***

This provision must be read in connection with Section 16 of these Regulations concerning geological and reservoir technical data acquisition in connection with drilling and well activity.

All sample depths shall be stated as measured depth in relation to the drill floor/Rotary Kelly Bushing (RKB). As regards fluid samples taken as downhole pressure samples, the date and name of the sample-taker shall be stated for both the pressure sample taken at the drilling facility and for subsequent opening of/sampling from the pressure sample in the laboratory. For fluid samples, depth interval is the same as perforation interval. Standard sample bottles for fluid samples may be procured by the Norwegian Offshore Directorate.

A "rig set" means 10-20 grams of all drill cuttings samples in a well/wellbore. The samples are washed and dried on the rig.

Palynological preparations shall be made with a "permanent mounting medium". Glycerin-gelatin is not a permanent mounting medium and shall not be used as a mounting medium.

Materials and documentation mentioned in this provision's second subsection, litras e) and f) and third subsection, litras c) and d) shall be submitted to Diskos in accordance with the Guidelines for reporting wells ("blue book"). This can be found at [sodir.no](http://sodir.no).

**Re Section 29. *Well data***

Materials and documentation mentioned in this provision shall be submitted to Diskos in accordance with the Guidelines for reporting wells ("blue book"). This can be found at [sodir.no](http://sodir.no).

**Re Section 30. *Interpreted well data***

An evaluation report for exploration wells where a suitable storage complex is proven shall be submitted to the Norwegian Offshore Directorate.

For all types of wells, a geotechnical and reservoir technical final report, as well as the digital data mentioned in this provision, shall be submitted to Diskos, along with reports on biostratigraphy, geochemistry and other special studies.

Materials and documentation mentioned in this provision shall be submitted in accordance with the Guidelines for reporting wells ("blue book"). This can be found at [sodir.no](https://sodir.no).

As regards the distinction between interpreted and non-interpreted data, reference is made to the guidelines for interpreted data at [sodir.no](https://sodir.no). This is also addressed under the notes on Section 25.

**Re Section 31. *Status report before injection and storage of CO<sub>2</sub> starts***

This report shall provide the authorities with a status update on storage-related aspects at the start-up date with emphasis on changes in basic data and any measures in relation to the original plans. The report shall describe the planned course of injection tailored to the expected storage capacity.

**Re Section 33. *Using geological sample material from the Norwegian Offshore Directorate***

The Norwegian Offshore Directorate has prepared separate guidelines to explain how access can be granted to extracts from geological sample materials and the criteria for such access. This can be found at [sodir.no](https://sodir.no).

**Info**

English version is only revised periodically and may not necessarily reflect recent changes.