



Naturvernforbundet

Friends of the Earth Norway

Submarine Tailings Disposal violates the Water Framework Directive



The tailings sandbank in Langfjorden, Kirkenes, 2011

Naturvernforbundet

The Norwegian Society for the Conservation of Nature/ Friends of the Earth Norway

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PREFACE

Seven mining companies have permits to dispose of large amounts of tailings directly into Norwegian fjords, and 6 of these are active. Naturvernforbundet is convinced that these permits represent violations of the Water Framework Directive (WFD).

WFD was implemented in Norway as the Norwegian Water regulations (vassforskrifta), 01.01.2007, and from that date WFD was an integrated part of Norwegian law.

Through the ECA agreement, Norway is internationally obliged to the articles of WFD, included guidance documents, common implementation strategies etc.

This document is Naturvernforbundet's assessment of how Norway practices WFD in connection with the question of Submarine Tailings Disposal (STD). We regard STDs as very serious impacts to the Norwegian fjords and to our common international seas as well.

Issuing new permits to use STD, or failing to withdraw the existing permits to use STD within the water management plan period, would represent violations of WFD, and a base for complaints to EFTA Surveillance Authority.

07.05.2015, Mads Løkeland, Naturvernforbundet's mining board.

CONCLUSION

1. 19.04.2015: Norwegian authorities violated the Water Framework Directive when Nordic Mining got a permit for dumping 6 million tonnes of mining waste, mixed with chemicals in Førdefjorden each year.
2. 13.03.2015: Norwegian authorities violated the Water Framework Directive when Rana gruber got a permit for a significant increase of STD in Ranfjorden.
3. 23.04.2008: Norwegian authorities violated the Water Framework Directive when Sydvaranger gruve got a permit for STD in Bøkfjorden, more than a year after the implementation of the Water Framework Directive as Norwegian law. There was no EIA that assessed the impact according to WFD prior to issuing the permit.
4. Norwegian authorities would violate the Water Framework Directive if there are issued any new permits to use STD, or permits for increased STD. The base for a complaint would be violation of article 4.7 in the Water Framework Directive or § 12 in the Norwegian water regulations.
5. 2015: Norwegian authorities violate the Water Framework Directive as the water management plans for 2015 – 2021 fail to address the problem of STD. The existing permits for STDs should be withdrawn as early as possible in the water management plan period 2015 – 2021. The base for complaint would be violation of article 4.1 in the Water Framework Directive or §4 and §8 in the Norwegian Water regulations.

6. Some of the tailings contain high concentrations of substances that are on the priority list of the Water Framework Directive, article 4.1 and 10.1, especially Nickel. This could be an additional violation of WFD.

SUMMARY

ALL PERMITS FOR STD GIVEN AFTER THE NORWEGIAN IMPLEMENTATION OF WFD, WERE GIVEN IN BREACH OF WFD

To issue a permit to dump mine tailings into a fjord is a violation of article 1 (purpose) and article 4.7 (new projects) of the WFD. This comprises the following STD permits:

- 23.04.2008: permit to Sydvaranger gruve for STD in Bøkfjorden
- 13.03.2015: permit to Rana gruber for a significant increase of STD in Ranfjorden
- 17.04.2015: permit to Nordic mining for STD in Førdefjorden

ONGOING STDS ARE IN BREACH OF WFD AND THE PERMITS SHOULD BE WITHDRAWN IN THE COMING WATER MANAGEMENT PERIOD

Norway is in the process of establishing water management plans for all water bodies for the period 2015 - 2021.

According to WFD, these water management plans should aim at achieving good ecological status and good chemical status for all regular water bodies or good ecological potential and good chemical status for HMWB or artificial water bodies during the period 2015 – 2021.

The continued disposal of mine waste into a fjord would make it impossible to achieve the quality requirements of WFD. The bottom of the fjord would be kept totally dead during the lifetime of the mine, and many years thereafter, and would be characterized as having bad ecological status. (In the last chapter we refer to the water management plans for the water bodies where there are ongoing STDs).

Continued disposal of tailings into the fjords would be in breach of §4 or §5 in the Norwegian Water regulations and the articles 1 and 4.1 in WFD.

A PERMIT TO INCREASE AN EXISTING STD IS A VIOLATION OF WFD

The application for increased STDs in Bøkfjorden, imply a doubling of the amount of mine waste disposed of in the fjord, affecting significantly larger areas of the fjord.

The Norwegian Water regulations and WFD require efforts to achieve at least good ecological and good chemical status. To increase the pollution pressure on the water body through a significant increase of waste disposal, will effectively hinder a development

towards a good ecological and good chemical status, and is thereby a violation of the Norwegian Water regulations and WFD.

Alternatively one could regard the doubling of the waste disposal as a new project to be assessed according to article 4.7 of WFD.

A NEW PERMIT FOR STD WOULD BE GIVEN IN BREACH OF WFD

A new project must be assessed according to §12 in the Norwegian Water regulations and article 4.7 in WFD. Our conclusion is that disposal of tailings into a fjord, with the sole purpose to get rid of industrial waste/ mine tailings, will always be in breach of WFD and the Norwegian Water regulations.

Disposal of mine waste into a fjord lowers the ecological status. The tailings smother large areas of the bottom and prevent new life to be established during the whole lifetime of the mine, and several years thereafter. Under such circumstances, the water body must be classified as having very bad ecological status, because the parameter with the least status decides the status of the whole water body. In some cases the disposal of mine waste would lead to bad chemical status in addition. As WFD require at least good ecological status and good chemical status, it would be a violation of WFD to issue a permit for STD.

If the water body is accepted as a Heavily Modified Water Body (HMWB), it is possible to avoid the requirement of achieving good ecological status. We claim that a project with the sole purpose of getting rid of mine waste never can be accepted as HMWB (we refer to the chapter dealing with HMWB and STD).

In other words, for a STD, it would never be possible to achieve the quality requirements of WFD. A permit for STD would then always be given in breach of WFD.

We refer to chapters concerning article 4.7 of WFD, §12 of the Norwegian Water regulations and the deterioration effect of mine waste.

HIGH CONCENTRATIONS OF PRIORITY CHEMICAL SUBSTANCES IN THE TAILINGS IMPLY AN ADDITIONAL VIOLATION OF WFD

Tailings disposal in a fjord, regardless of the contents, would make it impossible to achieve good status due to the smothering of the bottom. In addition, the disposal could be in breach of article 4.1 if the tailings have high concentrations of priority chemical substances.

Article 4.1.a.iv. of WFD: *«progressively reducing pollution from priority substances and ceasing or phasing out emissions, discharges and losses of priority hazardous substances».*

An example: The concentration of Nickel is very high in the planned STD in Repparfjord from Nussir (mining company). A permit for STD would therefore be in breach of WFD, article 4.1 and §7 in the Norwegian Water regulations.

The Directorate of Nature Administration (DN) has this assessment of the Nussir tailings:

«According to the Environment Impact Assessment, the concentration levels of Nickel in the tailings are higher than the limits for good chemical status. If the limits for Nickel are exceeded, this would mean bad chemical condition in the water body. DN will point out that §12 in the Norwegian Water regulations only has an opening for an exemption from good ecological condition, and not from good chemical condition. It would therefore not be allowed to dispose of tailings that imply bad chemical condition in the water body. DN will also remind that it is a condition that every practical measures should be taken to limit a negative development in the water body.¹» (Our translation)

The planned disposal of tailings in Førdefjorden, from Nordic Mining in Engebø, could also be in breach of article 4.1 of WFD due to a high content of Nickel. The concentration of Nickel in the tailings is well above the background level, but just inside Norwegian definition of good chemical status². But, this concentration is too high to be accepted in UK and Netherland. As WFD asks for the phasing out Nickel, and this project implies an increase, it is a question to evaluate whether this discharge would be in breach of article 4.1 of WFD.

HEAVILY MODIFIED WATER BODIES (HMWB) AND STD

HMWBs have reduced quality requirements:

- «Good ecological potential» (instead of «good ecological status»)
- «Good chemical status»

The question is whether a water body with a dumping site for mine waste can be designated as HMWB.

In connection with WFD, there is a series of guidance documents to help with the implementation. One of these documents is dedicated to the question of when a water body can be designated as HMWB, and there have been several international «workshops» to achieve a common implementation strategy.

¹ Directorate of Nature administration. (DN), 21.05.2012 on the STD application in Repparfjord from Nussir

² Miljødirektoratet: "Veileder for klassifisering av miljøkvalitet i fjorder og kystfarvann", 2229, 2007 (classification guide for environment quality in fjords and the coastal region)

SUBMARINE TAILINGS DISPOSAL CANNOT BE CLASSIFIED AS HMWB

Guidance document no 4 is about how to identify water bodies to be designated as HMWB. All the examples in the document are completed projects with important value for society.

Typical examples from the guidance document, of completed and valuable projects for the society:

- Ports
- Shipping channels maintenance/ dredging
- Power stations
- Flood protection
- Water supply
- Drainage
- etc

Every physical alteration and impact should in principal be changed/ removed if it makes it impossible to achieve good ecological status, but there are exemptions if the removal or amendments have consequences for important social functions as energy production, transportation systems etc.

If the removal of the impact has serious consequences for important social functions, the water body can be designated as HMWB, and thereby avoid the requirement of good ecological status.

If the removal of the impact does not give such consequences for important social functions, or it is possible to use sufficient amendments to ensure good ecological status, the water body should not be designated as HMWB.

In other words, it is only permitted to designate a water body as HMWB if the impact/ physical alterations of the water body is introduced to ensure valuable social functions, such as power production, transport, water supply, human security etc.

The Directorate of Nature administration (DN) puts it this way:

«To designate a water body as heavily modified, the condition is that the alterations of the hydromorphology properties of the water body that have to be made to achieve good ecological status, would have substantially negative consequences for important social functions as the environment in general, shipping, ports, water supply, electricity production, irrigation, flood protection, drainage and other similar areas. DN's opinion is that deposition of

mine tailings is not of a type that could be used as an argument to designate a water body as heavily modified, according to «vannforskriftens» § 5 second part.³»⁴

In other words, continued disposal of large amounts of mud that continually changes the hydromorphology of the water body, and where the sole purpose is to get rid of mine waste/ industrial waste, cannot be designed as heavily modified (HMWB).

Conclusion:

A water body with submarine tailings disposal cannot be designated as HMWB, and has therefore good ecological status as the valid quality requirement. Good ecological status is impossible to achieve for a tailings disposal area, as the tailings smothers everything on the fjord bottom. Submarine tailings disposals are therefore in breach of WFD.

ASSESSMENT OF SMALL IMPACTS

Common implementation strategy states that an impact should be assessed according to article 4.7 regardless the size of the impact.⁵

Then you are obliged to do an EIA of the project, regardless of whether the tailings disposal is 10.000 tons/year or 6 mill tons/ year.

ARTICLE 4.7 AND ASSESSMENT OF SOCIETY VALUES

The loss of environmental qualities is not the only factor that should be assessed when planning new projects. Losses in connection with fisheries, safe food, tourism, life quality etc should also be assessed on the negative side.

All activities that depend on clean fjords, both commercial and non commercial should be important factors to consider when assessing new impacts. The obligation to assess these factors has so far been underestimated in Norwegian assessments related to WFD, but is an integrated part of the common policy document for WFD, developed in collaboration with the national WFD directors, included Norwegian representatives.

Such policy documents have significant legal standing, as it is looked upon as a duty in EU to achieve common implementation of important directives.

³ DN 21.05.2012, Høring av søknad om tillatelse til drift av kobbergruve i Kvalsund kommune - Nussir ASA (Hearing of application for permit for a copper mine in the Kvalsund municipality . Nussir ASA)

⁴ Our translation

⁵ CIS: EXEMPTIONS TO THE ENVIRONMENTAL OBJECTIVES UNDER THE WATER FRAMEWORK DIRECTIVE allowed for new modifications or new sustainable human development activities (WFD Article 4.7), policy paper. 2006

“It is the duty of the European Commission to ensure that a harmonised, comparable and transparent approach on implementing the Water Framework Directive is taking place in-between Member States and in-between river basin districts. The WFD Common Implementation Strategy is a contribution to this process.”⁶

THE ASSESSMENT OF NEW PROJECTS

Article 4.7 of WFD (§12 of the Norwegian Water regulations) tells us how to assess new projects, but at the same time, the other articles of WFD and the Norwegian Water regulations are to be fulfilled.

WFD, ARTICLE 4.7 (NEW PROJECTS)

Member States will not be in breach of this Directive when:

- *failure to achieve good groundwater status, good ecological status or, where relevant, good ecological potential or to prevent deterioration in the status of a body of surface water or groundwater is the result of new modifications to the physical characteristics of a surface water body or alterations to the level of bodies of groundwater, or*
- *failure to prevent deterioration from high status to good status of a body of surface water is the result of new sustainable human development activities*

and all the following conditions are met:

- a) all practicable steps are taken to mitigate the adverse impact on the status of the body of water;*
- b) the reasons for those modifications or alterations are specifically set out and explained in the river basin management plan required under Article 13 and the objectives are reviewed every six years;*
- c) the reasons for those modifications or alterations are of overriding public interest and/or the benefits to the environment and to society of achieving the objectives set out in paragraph 1 are outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety or to sustainable development, and*
- d) the beneficial objectives served by those modifications or alterations of the water body cannot for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option.*

⁶ http://ec.europa.eu/environment/water/water-framework/objectives/pdf/2005_objectives.pdf

§12 OF THE NORWEGIAN VASSFORSKRIFTA (NEW PROJECTS)

New activity or new activity in a water body can be accepted, even if this implies that it is not possible to achieve the environment standards of § 4 - §6, or if the condition is deteriorated, if the reason is:

- a) new changes in the physical characteristics of a surface water body or changed level in a ground water body, or*
- b) new sustainable activity that deteriorates the environmental status of a water body from very good status to good status.*

In addition, the following conditions must be fulfilled:

- a) all practical steps are used to limit a negative development of the water body's status,*
- b) the benefits for the society from the new impacts or activities should be greater than loss of environmental quality, and*
- c) the purpose of the new impacts or activities cannot be achieved with other methods that are technically possible, not disproportionately costly, and are environmentally significantly better. (Our translation)*

TWO FOUNDATIONS FOR A PERMIT

ONLY PHYSICAL CHANGE

According to article 4.7 in WFD and § 12 in the Norwegian Water regulations, it is possible (given certain additional conditions) to accept a new project/ impact, that seriously deteriorates the ecological quality status of the water body, if it only modifies the physical characteristics. There is no exemption for chemical status

Afterwards, in the water management plan, there will be a question of whether this water body can be designated as HMWB. If the water body is not designated as HMWB, then the impact should be removed if it is not possible to achieve good ecological status.

To issue a permit for an impact, and then withdraw the permit shortly afterwards, when the impact is done, would obviously be extremely silly, and not the intention of WFD.

We refer to the chapter of heavily modified water bodies (HMWB), and how this should be assessed, according to the guidance documents and common implementation strategy.

The conclusion is that when assessing a new impact that only implies modification of physical characteristics, you should use the same methods as used when designating HMWB for existing impacts. If the impact cannot be designated as HMWB afterwards, there should not be issued a permit for this impact/ activity. Only activities/ impacts concerning important

purposes for the society, as ports, human safety, electricity generation, water supply etc, should be accepted. Disposal of mine waste in a fjord is obviously not an activity of this kind.

NEW SUSTAINABLE ACTIVITY

The requirement is that the new activity should be sustainable, and that the status of the water body is not less than good after the impact. This means that the requirement is at least good ecological status and good chemical status. This status is impossible to achieve when disposing of mine waste into a fjord.

ADDITIONAL CONDITIONS

Several additional conditions must be fulfilled:

- everything possible must be done to prevent reduced quality status
- the benefits for society must be greater than the losses for society and environment
- it is technically difficult/ impossible, or a disproportionately high cost to use other methods that are significantly better environmentally

ASSESSMENT OF THE BENEFITS FOR SOCIETY

§ 12 –b in the Norwegian Water regulations:

«the benefits for the society from the new impacts or activities should be greater than loss of environmental quality».

The parallel formulation in article 4.7 in WFD:

“the reasons for those modifications or alterations are of overriding public interest and/or the benefits to the environment and to society of achieving the objectives set out in paragraph 1 are outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety or to sustainable development”

WFD has significantly more specific requirements for assessing benefits and losses in connection with a new project/ impact than the Norwegian Water regulations.

	WFD	The Norwegian Water regulations
Assessment of benefits	“Overriding public interest”, benefits for health and security for the population or the magnitude of sustainable development.	Benefits for society
Assessment of losses	<i>the benefits to the environment and to society of achieving the objectives set out in paragraph 1</i>	<i>loss of environmental quality</i>

One question is how to interpret the sentence in WFD: “*the benefits to the environment and to society of achieving the objectives set out in paragraph 1*”. We dig deeper into this matter in the next chapter, and find that this means that the losses for all activity, both commercial and non commercial that depends on the environmental quality, should be included in addition to the general loss of environmental quality.

Based on this, a project could be accepted within the frame of the Norwegian Water regulations, while it could be rejected within the frame of WFD, which has a much wider base for assessment. In other words, assessments based on the Norwegian Water regulations could lead to conclusions in breach of WFD.

FISHING, SAFE FOOD, TOURISM, BIODIVERSITY, ECOLOGY ETC

To ensure an internationally transparent implementation of the directive, there was conducted a «Water Director’s meeting» 20.06.2005, also attended by the Norwegian representatives Trond Syversen from the Climate and Pollution directorate and Geir Taubøl from the Norwegian Water Resources and Energy Directorate. This meeting resulted in a «Policy summary and background document⁷» on «Environmental objectives».

The document has a sound legal standing:

“It is the duty of the European Commission to ensure that a harmonised, comparable and transparent approach on implementing the Water Framework Directive is taking place in-between Member States and in-between river basin districts. The WFD Common Implementation Strategy is a contribution to this process».

In other words, there is an objective that the member countries of the European Union (included Norway through the EEA agreement) should have a common approach and assessment of public interests and environmental issues when implementing the directive. When Norwegian representatives have participated in formulating the common guidelines for implementation of the directive, and thereby accepted the contents, this document has a significant legal value in Norway, in addition to the EU legal value.

The Policy summary and background document has an examples list of issues to be included in the assessment of new projects, for example:

- Protection and enhancement of health and biodiversity of the aquatic ecosystem (in particular since good ecological status requires good quality of the structure and the functioning of this ecosystem).
- Protection of human health through water-related exposure (e.g. through drinking, drinks and food production, bathing and consumption of fish, shellfish and seafood).

⁷ http://ec.europa.eu/environment/water/water-framework/objectives/pdf/2005_objectives.pdf

- Lower costs for water uses, e.g. water supply or fisheries and more cost effectively achieved improvements by reducing treatment and remediation costs (e.g. drinking water supply, sediment pollution).
- Improvement of the quality of life by increasing the amenity value of surface waters (e.g. for visitors, tourists, water-sports users, conservationist) and by increasing its non-use value and all non-market benefits associated.
- Promotion of sustainable uses thereby creation of new jobs (e.g. in ecotourism, fisheries and nature conservation sector).

(Our underlining)

Comparing WFD and the Norwegian Water regulations:

	WFD	Norwegian Water regulations
Assessment of benefits	<ul style="list-style-type: none"> • “overriding public interest” or <ul style="list-style-type: none"> • benefits for the health • security for the population • magnitude of sustainable development 	<ul style="list-style-type: none"> • Benefits for society
Assessment of losses	Values mentioned in article 1 of WFD: <ul style="list-style-type: none"> • Loss of environmental qualities • Loss of society’s general gain by achieving good water standard Some examples of the losses stated in the Policy document ⁸ : <ul style="list-style-type: none"> • health and biodiversity of the aquatic ecosystem • protection of human health, for example safe consumption of fish, shellfish and seafood • new jobs (e.g. in ecotourism, fisheries and nature conservation sector). • quality of life, through the value of surface waters (e.g. for visitors, tourists, water-sports users, conservationist) and its non-use value and all non-market benefits associated. 	<ul style="list-style-type: none"> • Loss of environmental quality

⁸ Policy summary and background document-environmental objectives, 2005.
http://ec.europa.eu/environment/water/water-framework/objectives/pdf/2005_objectives.pdf

WHAT IS EUS VIEW OF SUSTAINABLE DEVELOPMENT?

Article 4.7 of WFD only accepts new projects that either ensures health, safety or “sustainable development”.

EU’s strategy of sustainable development is explained in the document «RENEWED EU SUSTAINABLE DEVELOPMENT STRATEGY» 2006⁹.

Some excerpts:

“ENVIRONMENTAL PROTECTION

Safeguard the earth's capacity to support life in all its diversity, respect the limits of the planet's natural resources and ensure a high level of protection and improvement of the quality of the environment. Prevent and reduce environmental pollution and promote sustainable consumption and production to break the link between economic growth and environmental degradation.”

“Actively promote sustainable development worldwide and ensure that the European Union’s internal and external policies are consistent with global sustainable development and its international commitments.”

“PRECAUTIONARY PRINCIPLE

Where there is scientific uncertainty, implement evaluation procedures and take appropriate preventive action in order to avoid damage to human health or to the environment.

MAKE POLLUTERS PAY

Ensure that prices reflect the real costs to society of consumption and production activities and that polluters pay for the damage they cause to human health and the environment.”

“SUSTAINABLE CONSUMPTION AND PRODUCTION

Promoting sustainable consumption and production by addressing social and economic development within the carrying capacity of ecosystems and decoupling economic growth from environmental degradation”.

“Member States should implement the EU Biodiversity Strategy in both its EU and its global dimensions (Convention on Biological Diversity) and, in cooperation with the Commission, take measures to identify and implement priority actions to achieve the objective of halting the loss of biodiversity by 2010 and beyond.”

⁹ <http://register.consilium.europa.eu/pdf/en/06/st10/st10117.en06.pdf>

SUMMARY OF EU'S "SUSTAINABLE DEVELOPMENT"

Basic principles of the EU-treaties: "polluter pays principle, the precautionary principle and preventive action, and the principle of rectification of pollution at source".¹⁰

A short list of EU's basic principles of sustainable activity:

- Prevent further loss of biodiversity (support of CBD)
- Safeguard the earth's capacity to support life in all its diversity and respect the limits of the planet's natural resources
- Break the link between economic growth and environmental degradation
- Actively promote sustainable development worldwide and ensure that the European Union's internal and external policies are consistent with global sustainable development and its international commitments
(This principle should be linked to the ongoing work of UNEP and the London Convention to stop/ regulate the disposal of mine tailings into the sea from land based sources)
- Use the precautionary principle to prevent damage to health and environment

In short, it should be very difficult to use the label "sustainable development" for mining based on disposal of large amounts of waste into the sea.

THE MINERAL WASTE DIRECTIVE (MWD) AND SUBMARINE TAILINGS DISPOSAL

EU's directive on mining waste, 2006/21/EF – Mineral Waste Directive (MWD) is implemented in Norwegian law through a change of the Norwegian waste regulations (avfallsforskrifta) in 2012.

Article 13.4 of MWD has been interpreted as an opening for submarine tailings disposal:

"Member States shall make the disposal of extractive waste, whether in solid, slurry or liquid form, into any receiving body of water other than one constructed for the purpose of disposing of extractive waste conditional upon compliance by the operator with the relevant requirements of Directives 76/464/EEC, 80/68/EEC and 2000/60/EC."

As directive 2000/60/EC is the Water Framework Directive, this brings us back to the question of whether such disposal is in breach of WFD or not.

In connection with MWD, there is established a BREF-document, with a list of Best Available Technology. Norwegian representatives are actively lobbying to put submarine tailings disposal on the BAT-list, but this has been rejected so far.

¹⁰ http://ec.europa.eu/environment/water/water-framework/objectives/pdf/2005_objectives.pdf (page 8)

SOME SOURCES OF LAW FOR DISCUSSING SUBMARINE TAILINGS DISPOSAL

- The Water Framework Directive
- The Mineral Waste Directive
- Additional WFD documents
 - List of priority substances
 - Methods for characterizing and classifying water bodies
- Guidance documents¹¹
 - No 4 - Identification and Designation of Heavily Modified and Artificial Water Bodies (HMWB)
 - HMWB - Policy Summary
 - No 20 - Exemptions to the environmental objectives
- Common implementation strategy for the Water framework directive (guidance doc no 1)¹²
- Common implementation strategy , Exemptions to the Environmental Objectives under the Water Framework Directive, Article 4.4 – 4.6¹³
- Policy summary and background document-environmental objectives, 2005¹⁴
- Workshop documents
- Guideline documents
- EUs overriding market framework

THE BASIC PRINCIPLES AND REQUIREMENTS OF WFD AND THE NORWEGIAN REGULATIONS

The basic principles and requirements for the management of water bodies are found in §4 – §11 of the Norwegian water regulations, and mainly in the articles 4.1 – 4.6 of WFD.

These principles and requirements form a basis for claiming that all ongoing disposal of mining waste should be brought to a stop as early as possible during the first Norwegian water management plan period 2015 - 2021.

- All water bodies should have or should achieve at least good ecological and good chemical condition, with some exceptions for artificial or heavily modified water bodies
- Artificial and heavily modified water bodies should have or should achieve at least good ecological potential and good chemical condition.

¹¹http://circa.europa.eu/Public/irc/env/wfd/library?!=/framework_directive/guidance_documents&vm=detail&d&sb=Title

¹²http://circa.europa.eu/Public/irc/env/wfd/library?!=/framework_directive/guidance_documents/guidancesn os1seconomicss/ EN_1.0_&a=d

¹³http://www.euwfd.com/SH070430_A10b_Draft_CIS_Exemptions_WFD_Art_4.4-4.6.pdf

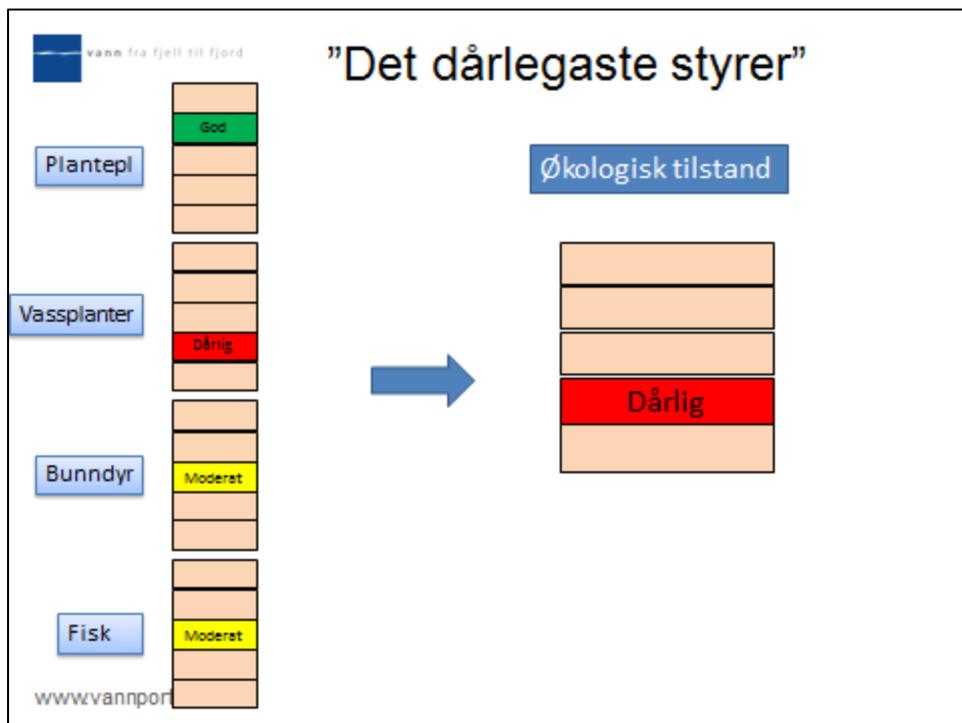
¹⁴http://ec.europa.eu/environment/water/water-framework/objectives/pdf/2005_objectives.pdf

(If a heavily modified water body has good ecological condition, then this good ecological condition should be maintained.)

- One should take special care for phasing out emission of certain priority substances, e.g. Nickel
- The quality standards should be achieved during the water management plan period of 6 years.
- In special cases there may be some exemptions
- When classifying the ecological condition or potential of a water body, the quality element with the least quality standard decides the overall quality class. E.g. organisms living at the bottom

As it takes time for biological life to be reestablished and to reach “good ecological status”, the tailings disposal should be brought to an end as early as possible in the water management period.

CLASSIFICATION OF ECOLOGICAL STATUS



The quality indicator with the least status decides the ecological classification of the water body as a whole.

When pouring mine tailings into a fjord, the quality indicator with the least status will probably be biological bottom life, and this will be totally smothered by the fine tailings.

The Directorate of Nature Administration (DN) describes the consequences arising from the disposal of tailings in Repparfjorden: *«The primary zone of the disposal area is calculated to about 5km², and there is no doubt that the ecosystem of bottom living animals will be destroyed, as all animals living in the sediment (infauna) in the disposal area will be killed. Animals living on the top of the sediment (epifauna) will also either die or keep away from the affected area.»*¹⁵

This hearing statement from DN describes the disposal into Repparfjord, but the conclusions are valid for all submarine tailings disposal systems. Disposal of mine tailings into the sea destroys the ecosystem at the bottom of the fjord and keeps it dead in the lifetime of the mine, and several years after.

Similar assessments have been done for Førdefjorden and Bøkfjorden.

The regional Governor of Finnmark assessed the status of Bøkfjorden (disposal of 4 mill tons yearly of iron ore tailings from Sydvaranger gruve): *«The use of submarine tailings disposal gives very bad ecological status for this water body, regardless of what kind of flocculation chemicals that are being used.»*¹⁶

In addition to the total smothering of all bottom life in large areas, the disposed material sometimes has high concentrations of chemicals or toxic metals, as DN states in the hearing of the application to dispose of tailings in Repparfjord:

*«The environmental impact assessment shows that the concentration of Nickel in the tailings is higher than the limit for good chemical status. In other words, this means bad chemical status of the water body. DN will emphasize that § 12 of the water regulation only has an opening to allow exemption from achieving "good ecological status", but not from the requirement of good chemical status for a water body. The disposal of tailings leading to bad chemical status is therefore prohibited. DN will also remind of the condition that all practical steps must be taken to limit a negative development of the water body.»*¹⁷ (our translation)

¹⁵ DN 21.05.2012, hearing of the application from Nussir to dispose of mine waste from a copper mine into Repparfjord.

¹⁶ Regional Governor of Finnmark 16.04.2012. Hearing of the application for increased tailings disposal in Bøkfjorden

¹⁷ DN 21.05.2012, hearing of the application from Nussir to dispose of mine waste from a copper mine into Repparfjord.

The negative effects could be lasting, and the Directorate of the Environment states that there have been lasting negative effects from the old tailings disposal in Repparfjord:

«There are no fish studies documenting what has happened after the closure of similar disposal areas. This is a serious lack of knowledge. Fishermen have claimed that fish disappear from the areas during the tailings disposal, and that the spawning areas are left void. In Repparfjord, a note from Akvaplan-NIVA, dated 2014.08.25 confirms the fishermen's assertions that the cod moved the spawning area further out in the fjord when the former tailings disposal area of Repparfjorden was in use. Almost 30 years after the closure of the tailings disposal, the cod has still not returned to the old spawning area in the inner part of Repparfjorden, known by old local fishermen. The choice of new spawning areas may be negative for the long term recruitment in a local population, and the density of cod eggs in Repparfjord is now much lower than in Revsbotn, a nearby reference fjord, not influenced by former tailings disposal.»¹⁸

INTERNATIONAL REPORTS

Similar assessments have been done by international research institutions:

The Scottish Association of Marine Scientists: *"The over-riding impact of deep-sea tailings discharges involves alteration of the physical environment due to the volume of waste material that is discharged, which smothers benthic organisms residing within the trajectory of the tailings density plume and inhabiting the final deposition area.*

This is particularly significant for sessile benthic organisms and organisms that move too slowly to escape being smothered. The extent of this impact can be difficult to predict given the lack of knowledge on specific marine benthic organisms.

Secondary effects relate to the toxicity of both particulate metals and metals released from the tailings solids, and the effects of residual process chemicals in the tailing waste, which may result in acute or chronic effects on the organisms exposed.

Depending on the nature of the deposited tailings waste, the deposition footprint is likely to represent a very different habitat compared to the adjacent un-impacted seabed. Changes in grain size may affect both burrow dwellers and deposit feeders.

A reduction in the particulate organic matter content will also reduce the general nutritional value of the solids material.

¹⁸ "Reguleringsplan for Engebøfjellet - svar på oppfølgende spørsmål". Environmental Directorate to the Department of Climate and Environment 19.11.2014

Overall, the following benthic impacts are likely:

- *Alteration of the physical environment (smothering of the benthos).*
- *Changes in species composition/abundance and biodiversity.*
- *Increased metal bioaccumulation.*¹⁹

The London convention/ protocol and UN's environmental organization UNEP, are collaborating to regulate/ stop disposal of tailings from land based sources, and had IMO make a report on this issue in 2012. The report summarizes the effects of submarine tailings disposal:

*«Marine disposal smothers everything in its footprint, with associated loss of habitat and benthic life in that footprint. This reduces the species composition/abundance and biodiversity. In addition, risks to humans can be increased from bioaccumulation of metals through food webs and ultimately to fish-consuming communities.»*²⁰

The report also concludes that the effects for marine life can be lasting.

Scottish Association for Marine Scientists has assessed some closed and ongoing tailings disposal locations and here are some of the conclusions:

“Kitsault, Canada (closed) – Accumulated metals in a pattern similar to the sediment chemistry, indicating metals had entered the benthic food chain.

Black Angel, West Greenland (closed) – Elevated concentrations of lead and zinc were detected in seaweed, blue mussels, and wolf fish liver and kidneys soon after mine operations began.

Since the mines closure, metal contaminated biota (Mytilus edulis) have been documented up to 35 km from the inner part of Qaamarujuk fjord; benthic foraminifera completely disappeared during mining operations; 10 years later, foraminifera species composition still did not indicate recovery of environmental conditions in the area.

Atlas Copper, Philippines– Evidence of elevated sedimentation, metal contamination, reduced coral cover, and surfacing tailings.

Lihir, PNG– ...The results show clearly that mine tailings deposition east of Lihir has a significant impact on macrofaunal communities at all three sampled depths.»²¹

¹⁹ Scottish Association for Marine Science (SAMS) report on DSTP, 2010. [page 17, Principal environmental issues related to DSTP]

²⁰ “International Assessment of Marine and Riverine Disposal of Mine Tailings”, 30.11.2012, Craig Vogt Inc, International Maritime organisation.

²¹ Scottish Association for Marine Science (SAMS) report on DSTP, 2010.

WHAT IS INERT GEOLOGICAL MATERIAL?

The London Convention and Protocol on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (LP/LC) has a “reverse list”, stating what could be allowed to dump, leaving everything else forbidden. “Inert inorganic geological material” is on the list of material that may be allowed for dumping, and therefore LP/LC has established rules for the assessment of “inert inorganic geological material”. This tool is developed especially for the protection of the sea, and should therefore be used in all cases where material is proposed to be dumped into the sea. When using the LP/LC assessment rules, mine tailings are not accepted as “inert inorganic geological material”, and therefore prohibited to dump.

It has been claimed that the tailings from e.g. iron and copper mines are just inert sand and mineral, and therefore harmless to dump in the fjords. The definition of “inert” material of the Mining Waste Directive (MWD) has been used to support this view.

We disagree with this, as the definition of “inert” material in MWD never was developed for characterizing materials to be dumped into the sea. The MWD definition is developed for characterizing material to be stored in well controlled and enclosed tailings disposal installations on land. This is illustrated in article 11.2.d of MWD, that specifies rehabilitation of the land where the waste facility is located: “*suitable arrangements are made for the rehabilitation of the land and the closure of the waste facility*”. In other words, MWD is not intended as a regulation of mining waste dumped freely into the sea.

Disposal of tailings directly into the sea is a totally different scenario than disposal in enclosed tailings installations. The characterizing of the tailings should for example also take into account the physical impact of the waste, due to the spreading of extremely fine particles freely in the water body. LP/LC assessment tool for defining “inert geological material” includes such effects.

LONDON CONVENTION AND PROTOCOL: TAILINGS ARE NOT INERT AND PROHIBITED TO BE DISPOSED OF IN THE SEA

The London Convention and Protocol on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (LP/LC), has established specific guidelines for the assessment of inert, inorganic material (2008). These guidelines ensure a common approach to the question in all convention states.

LC/LP and the prevention of pollution of the seas, applies for all marine waters, but without legal authority when it comes to the dumping from land based sources. LC/LP has collaborated with UNEP-GPA since 2008 to address the problem of dumping of mine tailings from land based sources.

The detailed LC&LP guidelines should be used as a general approach for characterising tailings as being inert or not, even in cases outside the jurisdiction of the London convention and protocol, when it comes to the question of dumping tailings freely into the sea, even from land based sources.

Cited from the LC/LP guidelines²²:

"A. Questions to determine whether the candidate material is geological:

1. *does the candidate material only comprise materials from the solid mineral portion of the Earth?*

and

2. *has the material been altered from its original state by physical or chemical processing in a way that would result in different or additional impacts to the marine environment compared with those expected from the unaltered material?*

If the answer to 1 is YES and the answer to 2 is NO, the material is geological in nature.

If the answer to 1 is NO or the answer to 2 is YES, the material is not geological and cannot be considered for dumping as "inert geological material".

B. Questions to determine whether candidate geological materials are uncontaminated:

1. *have contaminants been introduced at the material's source? (e.g., has the material been exposed to spills or other sources of contamination or subject to inadequate pollution controls);*

and

2. *have contaminants been introduced or concentrated beyond a magnitude greater than naturally found in geologically similar material during any subsequent processing or modification of the material?*

If the answer to both of the above questions is NO, the material can be considered uncontaminated.

If the answer to either of the questions above is YES, the material is contaminated and, therefore, may not be considered for dumping as uncontaminated "inert geological material" unless it can be verified that all necessary steps have been taken to remove the contaminants."

Our comments to the use of the guidelines

- A. Are the tailings "geological", according to the definition?

Mining wastes are usually extremely fine crushed material (altered through physical processing). Compared to the original material, the tailings will behave very differently in

²² REVISED SPECIFIC GUIDELINES FOR THE ASSESSMENT OF INERT, INORGANIC GEOLOGICAL MATERIAL (Adopted in 2008)

water. The fine particles will spread in the water and smother everything at the bottom in a very different manner than the original material. Toxic metals/ content of the particles will also be much more readily available for leakage. More readily available radioactive material could also be an issue.

In almost all cases, the answer to question A, is that tailings are not acceptable as inert geological material, according to the LC/LP definition.

B. Is the material not contaminated?

During the process, most tailings will be exposed to/ mixed with chemical residues from explosives, flotation and flocculation agents, and perhaps other chemicals, oil spills etc as well. The guidelines are very specific, and state that the contaminants should not be introduced "beyond a magnitude greater than naturally found in geologically similar material". As flocculation and flotation agents are not naturally found in geological material, the concentration will always be greater than naturally found.

In most cases, the answer to question B is that tailings are not acceptable as inert geological material.

Our conclusion is that according to the guidelines of LC/LP, almost all known mine tailings will fail the test, and will be discarded as inert geological material acceptable for dumping in the sea.

THE SCOTTISH ASSOCIATION FOR MARINE SCIENTISTS: TAILINGS ARE NOT "INERT", AND PROHIBITED TO BE DISPOSED OF IN THE SEA

«the London Protocol prohibits all dumping, except for certain wastes named on a "reverse list". The Protocol does allow for marine disposal of 'inert, inorganic geological material,' but this does not include mine waste, as tailings have not been shown to be 'inert'.²³»

UK: MOST TAILINGS ARE NOT INERT

"In our view, the issue of whether excluded material which has been subject to processing remains outside the definition of industrial waste depends on the nature of the waste material compared to that of the original raw material from which it was derived."

"In order to separate the coal from the rock, this material was finely ground and put through a flotation process, which involved the addition of oil and produced an underflow of residual tailings waste. This waste consisted of a slurry of fine-grained rock particles in water with

²³ An alternative: Deep-sea tailings placement - Part 2 By Ferret - www.ferret.com.au. 07.06.2013.
<http://www.ferret.com.au/c/Ferret-www-ferret-com-au/An-alternative-Deep-sea-tailings-placement-Part-2-n2505240>

traces of flotation oil. The raw material in this case had clearly been altered in producing the waste, which now included additional substances. The authorities in the United Kingdom concluded that dumping of this material should therefore be phased out in line with the decisions of the third North Sea Conference (1990).²⁴ (Our underlining)

THE NORWEGIAN DIRECTORATE OF THE ENVIRONMENT: TAILINGS WITH PROCESS CHEMICALS ARE NOT INERT”

“Tailings to be placed in the deep sea tailings placement are not inert, due to the chemicals left from the process, but we do not regard them as dangerous.²⁵” (Our translation).

IN BREACH OF THE CONVENTION OF BIOLOGICAL DIVERSITY (CBD)

The Directorate of the Environment claims that submarine tailings disposal is in breach of CBD.

«By international law, Norway is obliged to make decisions that are not in breach of the Convention of Biological Diversity (CBD). CBD is a global convention that covers both terrestrial and marine biological diversity in the national jurisdiction. In 2010, Norway committed itself to new global targets for biodiversity reaching 2020 (Aichi-measures). Among these, measure 4, that deals with sustainable production and consumption, and that the impacts from the use of nature resources should be kept well inside safe ecological limits.

The proposed activity is against superior principles from the Convention of Biological Diversity; sustainable use, precautionary principle, and ecosystem approach. In addition it violates especially Aichi-measure 4, as described above.²⁶» (Our translation).

ABANDONED ELSEWHERE IN EU

United Kingdom, Greece and France have been allowing submarine tailings disposal prior to the implementation of WFD, but today this is abandoned.

UK

Boulby potash mine disposed of 200.000 tons of solid residues into the sea until 2003, when they started backfilling the solid material into void parts of the mine. British authorities demanded an end to the STD, and the company got funding from the European Union’s Life Environment programme for developing the backfill technology.²⁷

²⁴ London Convention: Interpretation of industrial waste Submitted by the United Kingdom. 18.-22. sept 2000

²⁵ Email from the Norwegian Directorate of the Environment to Nordic Mining, 16.04.2015

²⁶ Directorate of the Environment, Hearing of the application from Nussir ASA, for permit to mining activity in Kvalsund 21.05.2012

²⁷ BBC news 14.11.2003

GREECE

Until about 2012-2013, Aluminum of Greece disposed of about 500.000 tons/year of red mud into Antikira Bay. Through funding from the European Commission, there are developed alternative uses of the red mud. All residues from the alumina production are now either used for alternative purposes or stored in controlled landfills.²⁸

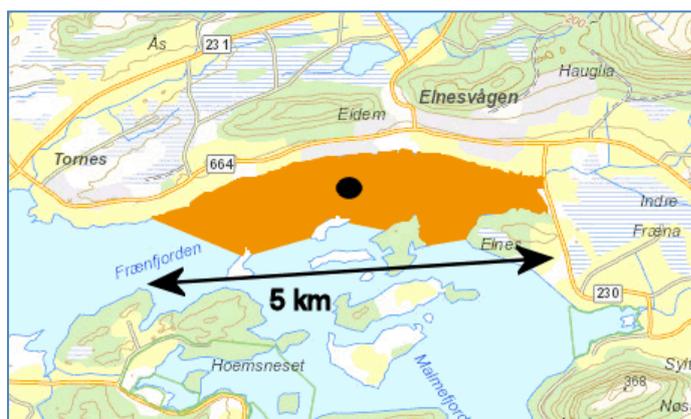
FRANCE

Rio Tinto alumina production factory at Gardonne, has disposed of red mud into the Cassaidagne cleft since 1966. In 1996 they disposed of 1 million tons/year, which has been diminishing to 0.18 million tons/year in 2014, due to increased alternative use. 31.12.2015 the submarine disposal will stop completely.²⁹

NORWEGIAN DISPOSAL SITES FOR MINE TAILINGS

ONGOING MARINE DISPOSALS

HUSTADMARMOR – FRÆNFJORDEN



Figur 1 Ecological status is set to "bad". The black circle marks the dumping site.

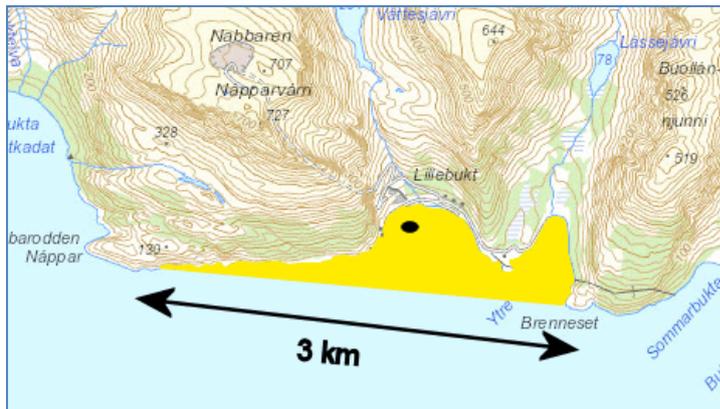
400.000 tons/year of tailings mixed with process chemicals are dumped in Frænfjorden from Omya Hustadmarmor AS in Møre og Romsdal (lime stone processing). The disposal depth is 40–50 meters.

The water management plan for the water region of Møre og Romsdal (2014), classifies the status of Frænfjorden as "bad", due to the tailings disposal. No action is proposed, apart from surveillance.

²⁸ "BEST PRACTICES, BEST FOOTPRINT", Sustainable report 2014, CEO MYTILINEOS Group of Companies

²⁹ The mayor of Cassis, Danielle MILON. Le Cassiden, October 2014

SIBELCO NORDIC – STJERNØYSUNDET



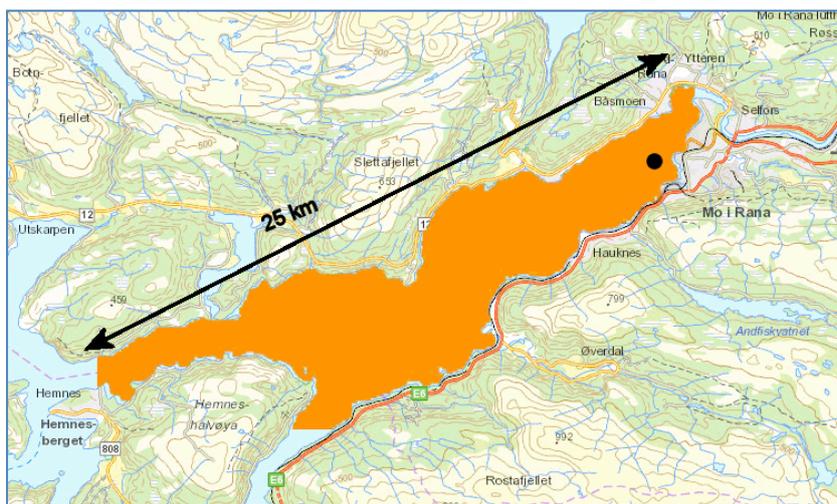
Figur 2 Lillebukt is classified as "moderate" ecological status due to tailings disposal. Source: www.vann-nett.no, the Norwegian water management information pages. The tailings dumping site marked with a black circle.

200.000 tons of tailings/year are dumped in Lillebukt/ Stjernøysundet from Sibelco Nordic in Finnmark (Nefelinsyenite). The disposal depth is about 50 meters.

This material is accepted as potassium fertilizer in ecological farming, and could have replaced half of all potassium fertilizers used in the Norwegian farming instead of being dumped as waste.

In the water management plan for the water region of Finnmark (2014), the status of Lillebukt is classified as "moderate", due to the tailings disposal. No action is proposed,

RANA GRUBER – RANFJORDEN



Figur 3 Ranfjorden: the ecological status is classified as "bad". The situation farther out is undefined. Source: www.vann-nett.no, the Norwegian water management information pages. The location of the tailings dumping site is near the black circle.

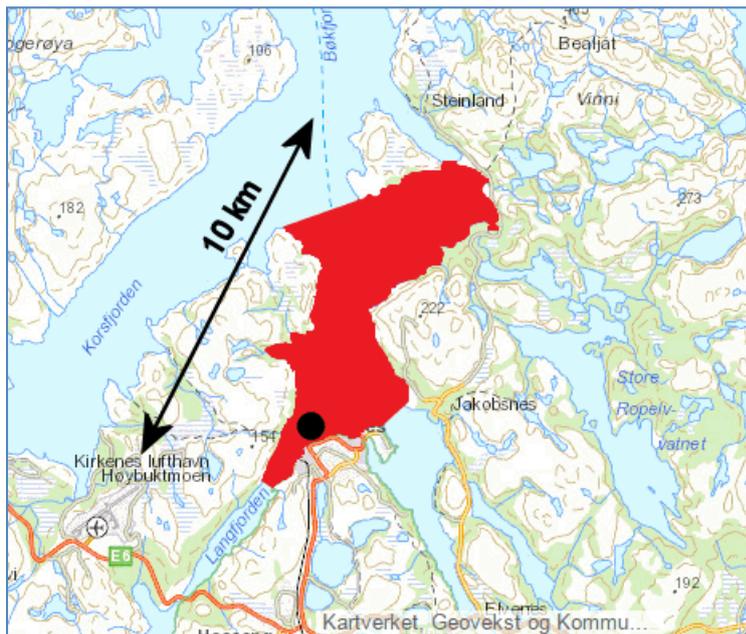
2 million tons/year of tailings with process chemicals are dumped in Ranfjorden from Rana Gruver AS (iron ore) in Nordland. The disposal depth is about 80 meters. The mine was

allowed to increase the amount to about 3 million tons/year when the Dep. of Climate and Environment issued a new permit 13.03.2015.

According to the Institute of Marine Research, the ecosystem of the fjord is threatened, and the biological production in the surface layers is inhibited. In the water management plan for the water region of Nordland (2014), Ranfjorden is classified as "heavy negatively influenced", with "bad" ecological status. The chemical status is classified as "will not reach good". Little is proposed to better the situation, apart from surveillance.

Little has been done to find methods of waste minimizing or backfilling in the mines.

SYDVARANGER GRUVE – BØKFJORDEN



Figur 4 Bøkfjorden has both "very bad" ecological status and chemical status. Source: www.vann-nett.no, Norwegian water management information pages.

The permit was given 2008.04.23, almost 1,5 years after the implementation of WFD in Norwegian law.

4 million tons/year of tailings mixed with process chemicals are dumped in Bøkfjorden from Sydvaranger Gruve AS (iron ore). The disposal depth is about 50 meter.

The ecosystem of the fjord is heavily negatively influenced, especially on the bottom.

In the water management plan of Finnmark (2014), the status of Bøkfjorden is classified as "very bad", due to the tailings disposal. The main reason is the dumping of tailings into the fjord. No action is proposed to better the situation, apart from surveillance.

PERMIT WITHOUT EIA ACCORDING TO THE WATER FRAMEWORK DIRECTIVE

The permit for submarine tailings disposal from Sydvaranger gruve in Bøkfjorden of 4 million tons of tailings and 35 tons flocculation chemicals each year, is dated 23.04.2008 by the former Norwegian Pollution Control Agency (now: the Norwegian Environment Agency), without any assessment concerning § 12 in the Norwegian water regulation or article 4.7 in WFD. As WFD was implemented as Norwegian law in January 2007 the Norwegian authority should have made an assessment of article 4.7 of WFD before issuing a permit.

As the permit was not assessed in connection with §12 of the Norwegian water regulations, the permit was issued in breach of Norwegian and EU law.

The regional Governor of Finnmark has written about the duty to assess §12 of the Norwegian water regulations (article 4.7 in WFD) in connection with permits for submarine tailings disposal, according to the argument above³⁰:

"The Norwegian Climate and Pollution Agency is obliged to assess the application according to Law of Pollution (forurensningslova). The decision must also have been assessed according to the Law of Biodiversity (naturmangfaldlova) and the Water regulations (vassforskrifta). Especially § 12 of the Water regulations, about new activity, is relevant. § 12 of the Water regulations shall be the basis for decisions according to the Law of Pollution that may lower the status in one or more water bodies. § 12 of the Water regulations give limits for such decisions. When assessing a new influence, caused by a pollution that is chemically or biologically active, the Water regulations impose a significant constriction of the allowed judgments according to the Law of Pollution.

The Norwegian Water regulations represent the implementation of EU's Water Framework Directive in Norwegian law. § 12 of the Norwegian Water regulations is the implementation of article 4.7. Any decision according to the Law of Pollution that is in breach of § 12 of the Water regulations is, in our opinion, in breach of Norway's obligations by the European Economical Area agreement." (Our translation)

PERMIT GIVEN IN BREACH OF REGULATIONS AND DIRECTIVE

In this document we conclude that it is in breach of §12 of the Water regulations and article 4.7 in WFD to issue a permit for new activity that includes submarine tailings disposal in a fjord. The permit for STD in Sydvaranger gruve was given after the implementation of WFD in Norwegian law, and was therefore given in breach of both Norwegian and EU law.

³⁰ The Regional Governor of Finnmark 15.05.2012. Hearing on the application for permit to submarine tailings disposal in Repparfjord from Nussir ASA

As a site for submarine tailings disposal cannot be classified as heavily modified water body (read the chapter of HMWB and tailings disposal), Bøkfjorden should have at least “good ecological status” and “good chemical status”.

NIVA’s report of the condition in Bøkfjorden after the first 1.5 years of tailings disposal with only half of the permitted amount, shows bad condition in large parts of the fjord, and that the fjord system is heavily influenced 10 km from the disposal point.

The regional Governor of Finnmark has assessed the new application for a doubling of the disposal from 4 to 8 million tones/year: *«Using submarine tailings disposal will result in very bad ecological status in this water body, regardless of what kind of flocculation chemicals that are being used.»*³¹

In the proposed water management plan for the water region of Finnmark (2014) the ecological status of Bøkfjorden is characterized as “very bad”, and the disposal area is not proposed as a candidate for HMWB. Stopping the tailings disposal is not a part of the plan: *“None of the proposed actions can do anything about the bad quality status, that is caused by the submarine tailings disposal, burying animals living on the bottom, thereby giving bad ecological status.”*

Sydvaranger’s permit – a summary:

- The tailings disposal permit was issued after the implementation of WFD as Norwegian law, and should have been assessed accordingly. This was not done.
- The ecological status is assessed as “very bad”, and no actions are proposed to do anything about that situation.
- The tailings disposal area is not a candidate to be characterized as HMWB

The conclusion is that the permit was given in breach with the Norwegian Water Regulations and WFD.

³¹ The Regional Governor of Finnmark, 16.04.2012. Hearing of the application of increased tailings disposal in Bøkfjorden

- More than a doubling of the yearly amount of tailings disposal in Bøkfjorden from 4 to about 9 million tonnes a year, included a significantly increase of chemicals. Depth of disposal about 40 – 60 meters.

NORDIC MINING AS - FØRDEFJORDEN

19.04.2015, the Norwegian government issued a permit to the disposal of 6 million tons/year of tailings in Førdefjorden (The Engebø project in Sogn og Fjordane) from a rutile mine. The amount and type of chemicals is not yet set. The disposal depth will start at about 300 meters and fill the fjord up to 150 meters during the life time of the mine, covering an area of many square kilometers. Førdefjorden has exceptionally high ecological status, important for fisheries, and the inner part has the "national salmon fjord" status.

The Directorate of Nature Administration and the Directorate of Fisheries are against the application, and the Institute of Marine Research has written a very negative report. In 2014, the Directorate of the Environment warned against a permit, especially because the disposal would endanger red list species. Especially it is critical for the red listed "blålange" (*Molva dipterygia*), as Førdefjorden is the only registered aquaculture site near the coast.

The copper content of the tailings is high, and according to the classification system for contaminated sediments, it would be classified as "bad" due to the copper content. (The classification system of the Directorate of the Environment).

The concentration of Nickel in the tailing is so high, that the disposal could be in breach of the obligation to reduce the emission of priority substances.

The tailings will contain 3000 tonnes of nanosized particles, and about 100 tonnes will be TiO₂. Titanium dioxide (and several other types of nanoparticles in the tailings) are known to have toxic effects on marine life.

The National Institute of Nutrition and Seafood Research (NIFES) is concerned that the planned dumping of mine waste in Førdefjorden could have impacts on the safe food from fish, shellfish and seafood in general. They are especially concerned that Cadmium could leak out from the deposits and enter into the food chain, and of increased level of nanosized TiO₂ particles in shellfish and crab. They are also concerned about the level of acrylamide arising from the flocculation chemicals, and that Acrylamide might be concentrated throughout the food chain, thereby representing a health risk.

All the Norwegian organizations for the important fisheries and aquaculture sector and the important tourist business sector have protested strongly against a permit for waste dumping, and 32 international environmental organizations have written a letter to the government, also protesting against the dumping of mine waste dumping.

Tailings disposal of 2 million tons/year from a copper mine into Repparfjorden in Finnmark, mixed with process chemicals.

There are high concentrations of copper, nickel and chromium in the tailings.

The Directorate of Nature Administration (hearing 21.05.2012) writes about the question of chemical status of the fjord, based on the metal content of the tailings: *«it is not permitted to allow disposal of tailings that imply that the water body will have bad chemical status»*.

The tailings will have so high concentrations of heavy metals that the classification system of contaminated sediments would classify the tailings as “very bad”³².

The concentration of Nickel is so high that it would obviously be in breach of WFD and the list of priority substances to allow disposal of these tailings in Repparfjord.

³² The Directorate of the Environment, Guidance document for classification of environmental quality of fjords and costal areas. ta2229, 2007.