***Centre for Economic Development, Transport and the Environment in Lapland*.** Some of the documents in the EIA report are missing from the consultation material (e.g. Annexes B9 and K9). For example, no description of the water purification process, total load of the water emission or joint impact assessment is available. The assessment of many factors directly affecting water emissions appears to be incomplete. The effect of an exceptionally rainy or dry year on the concentration effect of the emission load has not been taken into account. The impact of the water emissions on the lake Hosiojärvi sedimentation or water quality at different depths has not been described in detail.

In order to assess the effects on aquatic fauna in the River Tornionjoki, the mixing distance of the emissions in the channel should also be assessed, and the habitat conditions in the affected area should be analysed. The environmental impact assessment does not indicate the distance from the discharge point to the point of the Tornionjoki River where the lower concentrations have been calculated. Based on the available material, the adequacy of the assessment cannot be assessed. The environmental impact assessment should be done in view of the size and risks of the project before granting the permit.

The project also involves an earlier plan to excavate graphite ore from three other ore bodies where the ore would be enriched in the Southern Nunasvaara area. The final size of the project may be much larger than Southern Nunasvaara mining project alone. In order to exclude the project's transboundary impacts, the load of emissions into the water must be monitored extensively in the River Tornionjoki.

The consultation material does not include annexes dealing with the impact assessment of Natura 2000 areas (annexes B9 and K9). The consultation material does not include the permit application or decision. It should be noted that, as the competent authority in Sweden, the Country Administrative Board has demanded a permit in accordance with Chapter 7, section 28 a of the environmental Code, as the activities may have significant environmental impacts in the Natura 2000 area. The impacts of this project as well as the cumulative impacts of other projects on the ecological values on which the conservation of a Natura site is based must be duly assessed in order to exclude significant degrading impacts before the project is approved.

Centre for Economic Development, Transport and the Environment in Lapland acting as the Fisheries Authority. The Tornionjoki river basin is an exceptionally valuable watercourse in terms of fisheries. Fishing tourism in the River Tornionjoki has a significant impact on the regional economy. The uncertainties associated with the project must be addressed in the permit process, considering the exceptionally high fishery value and special importance of the Tornionjoki river system as a breeding area for Baltic salmon, sea trout and migratory whitefish.

The majority of the annexes to the EIA report were not available during the consultation. Based on the Swedish-language EIA report, there are uncertainties related to the water management and environmental impacts of the mine project. The consultation material available for assessing the project is insufficient. Only a summary has been presented of the technical description document. In addition to this a significant part of the annexes to the Swedish EIA report are not available. Furthermore, the environmental impact assessment

does not take into account the cumulative effects caused by the Nunasvaara mining project with other mining projects planned in the area.

The EIA report does not clearly indicate how fluctuations in flow rates at different times of the year or in the case of exceptionally high rains have been taken into account in the planning of the mine's water treatment structures and water treatment processes. In addition to the mine's process waters, melt water and rainwater that requires purification may accumulate from large areas, and the flow fluctuations caused by them may be considerable. The uncertainties caused by climate change, such as the impacts of extraordinary rains and high flows, should be taken into account during the mine's operating period. Melt water and rainwater accumulating in the mining area may exhibit high pH value variation and harmful high metal concentrations. Consequently, the treatment of rainwater and storm water may also require neutralization that is more efficient and the removal of metals before the water is conducted into the sedimentation basin and further into the water body. The EIA report does not indicate the applicant's preparedness for exceptional situations. For example, risk of collapse of a dam in a sedimentation basin.

Sulfate pollution in Lake Hosiojärvi increases the salinity of the lake and increases the risk of permanent layers in the lake's deeps, which may cause permanent oxygen depletion in the hypolimnion. Nutrients discharged with the wastewater into the lake cause eutrophication, which may impair the oxygen situation of the hypolimnion in the stratification periods. The deteriorating oxygen situation increases the risk of internal loading in the water body. These factors cause uncertainty in the assessment of Lake Hosiojärvi's development and the changes in the quality of water leaving the lake. In the long term, the status of Lake Hosiojärvi may deteriorate permanently and the deterioration of the lake may increase emissions to the water bodies downriver.

Based on the assessments presented in the consultation materials, the planned mining activities would probably not have significant adverse impacts on water bodies and fisheries extending to the Tornionjoki River on the Finnish side in normal circumstances. On the other hand, emissions from mining activities caused by exceptional situations could have impacts on the Finnish side of the Tornionjoki River and its Natura 2000 area. Therefore, it may be necessary to examine the potential cumulative impacts of the Nunasvaara mining project and other mining projects in the Tornionjoki river basin.

The potential risks associated with the quantity and quality of stormwater and leachate must be taken into account in more detail in the permit granting process. The treatment of stormwater and leachate may require effective pH regulation and removal of metals. The design and efficiency of the water treatment equipment has also not been described in detail at different times of the year and in exceptional runoff situations. The impact of exceptionally substantial melt water and rainwater on the mine's water balance and on the adequacy of water treatment capacity should be taken into account in the permit process.

The permit application presents emission limit values only for copper, nickel and zinc concentrations. It may also be necessary to set emission limits for other metals. In addition, the estimates of the sulfate content of water conducted into the water body vary in different application documents. The sulfates discharged into Lake Hosiojärvi affect the lake's stratification layers.

In order to prevent adverse impacts on the River Tornionjoki, the applicant must present in more detail how to prepare for exceptional situations and risks. Potential risks should be

assessed, for example, relating to leaks in the sedimentation basin and the bursting of the dam. The ecological impacts caused by the realization of these risks should also be assessed.

The shielding of the waste rock and tailings affects the emissions generated by the mine after the termination of mining activities. The BAT principles must be followed in shielding waste rock and tailings areas.

In order to collect reference data, fisheries analyses must be included in the preliminary monitoring for the mine. For example, the occurrence of salmon and their spawning areas in the area impacted by wastewater should be monitored. During mining activities, impact monitoring must be extended to the Tornionjoki River at least with regard to impacts on water bodies. An effort should be made to assess the impacts of the activities on fisheries on the basis of the results of water monitoring and, if necessary, also on the basis of fisheries monitoring.

Regional Council of Lapland. The regional plan in Finland designates the border river Tornionjoki as a nature conservation area and the river is part of the Natura 2000 network. The regional plan also designates three mining areas on the Finnish side of the border near Nunasvaara mining project: Kalkkikangas, Mannakorpi and Hannukainen. These mining projects are subject to regulation according to which mining activities must be planned in such a way that they do not cause significant emissions or hydrological effects in an area included in the Natura 2000 network of the Tornionjoki-Muonionjoki river basin or otherwise significantly weaken the natural values of the area for which it has been included in the Natura 2000 network.

The Swedish EIA report should include the possible cumulative effects of other mining projects on the Tornionjoki-Muonionjoki river system. The Regional Council of Lapland states that the Nunasvaara mining project must under no circumstances cause adverse impacts on the Tornionjoki-Muonionjoki river basin.

City of Rovaniemi Environmental Committee. The quality of the waters discharged from the mine to the Tornionjoki River raises concerns. The mining company's proposal to postpone setting limits for the emissions of copper, nickel and zinc for the duration of the trial period is questionable. There should be appropriate procedures in place to react to unexpected situations where harmful emissions are discharged into the water body. Any activity that causes harm to the water body should be ceased immediately and there should be procedures in place to do this.

The consultation material does not address the procedures for situations where the concentrations of substances discharged from the mining project become disproportionately harmful and inflict harmful consequences in the Tornionjoki river system to the aquatic environment, fish and other use of water. The EIA report does not cover any pre-emptive mitigation measures for unexpected situations. The EIA report does not take into account the possible acidifying effect of sulfate and no threshold values have been set for sulfate.

The European Commission has issued a statement on the use of the EIA Directive on 18 June 2021. According to the statement, the Directive must be taken into account when granting a permit. The mining company has proposed a permit with no limit values for the different substances discharged into the water body. Granting a permit with this condition is against EU legislation.

The applicant's assessment is not a justification for not setting threshold limits for harmful substances. Threshold limits define the maximum permitted load on rivers and protect the state of the environment.

The EIA report does not have detailed descriptions of the shale rock. The rock type is probably black shale rock, which in Finland is considered particularly harmful for the environment. This is due to the sulfur content of the rock and the resulting generation of acid leachate. This should be taken into more detailed account in the EIA report.

The following matters should be clarified with particular precision:

1. The impacts of the water emission load must be examined at different times of the year, taking into account seasonal variation.

2. Particular attention must be paid to the dilution in the minimum flow and the lowest possible flow between summer and winter as well as the average flow and the lowest possible flow in the wintertime and the dilution of mining water in these low water circumstances.

3. The impact of discharged water on the quality of river water

4. Dilution of discharge water in river waters

5. The overall impact on the Tornionjoki River included in the Natura 2000 network

6. The impact of dischraged water on the living environment, especially on fish stocks

7. The impact of the emission load on groundwater areas in the River Tornionjoki downriver from the discharge site of the mining water

8. The effect of a potential dam accident or significant dam leak should be investigated in relation to the construction and safety of dams and ponds in the mine

9. Impacts on reindeer husbandry on the Finnish side of the border

The continuation and expansion of the mining project must not have any adverse effects on the quality of water in the Tornionjoki River. Before commencing mining activities, emission thresholds should be set for all discharges into waters so that no harmful impact can arise. The determination of these emission thresholds must take into account seasonal variations in the river. The fish stocks and fishing in the River Tornionjoki should not be subject to discharges that are harmful or may pose a risk of pollution.

No permit should be granted for the expansion of the mining project that does not set thresholds for emissions in proportion to the quantity and flow of river water at different times of the year with regard to the quantity of water in the river. Procedures need to be in place so that there is no danger of damage to the mining projects dams in the form of a dam leak or dam breaking and fracturing.

A sufficient account must be provided for the dam structures, design and the monitoring of dam safety. The fact that climate change is expected to increase rainfall in the North Calotte region in the coming decades should be taken into account when designing the dams.

The emission thresholds for water discharges must be set so that the discharge waters do not in any way endanger the quality of water at the Tornionjoki beaches, the use of water by

coastal residents for recreation or fishing, reindeer husbandry or the usage of fish for food. The permit process must include an adequate human impact assessment.

It is particularly important to determine the combined impact of the mining project's wastewater with the other mines which have their wastewater conducted into the Tornionjoki river basin. A situation should not arise where it is no longer possible to conduct mining projects on the Finnish side of the border because of the level of contaminants in the wastewater from the Nunasvaara mine.

***Municipality of Ylitornio*.** The Environmental Committee of the city of Rovaniemi will issue a statement on behalf of the Municipality of Ylitornio.

Municipality of Enontekiö. The mining project must not have any significant environmental impacts on the quality of water or the aquatic ecosystem in the Tornionjoki-Muonionjoki rivers. The catchment basin of the Tornionjoki-Muonionjoki rivers is included in the Natura 2000 network. The mining project must not endanger salmon rising upstream or the area's ecosystem in the long term.

***Environmental Healthcare Authority of Tunturilappi*.** The use of the Tornionjoki and Muonionjoki rivers for recreation and professional fishing should be taken into account when assessing the environmental impacts of the mining project. The population may be exposed to contaminants and impurities in surface waters through fish used as food. Methylmercury is efficiently accumulated in fish in the food chain, especially in predatory fish. The natural background concentration of metals such as mercury and methylmercury is water-specific and may vary between water systems. Approximately 95% of the mercury contained in fish is methylmercury.

Mercury and methylmercury should be added to the mining project's list of substances monitored in the environment. The accumulation of these metals in fish stocks and water downriver from the mining area should be monitored for a longer period in order to observe changes in concentrations and to assess the usability of fish as food or the health risk associated with the concentrations of metal in the water.

Metsähallitus (Forststyrelsen). The consultation material that has been translated into Finnish contains only a fraction of the total data in the Swedish EIA report. Only the summary of the EIA report is translated into Finnish and most of the annexes are not available. The material does not include annexes B9 and K9, which describe the project's impacts on the Natura 2000 area and the cumulative impacts of different mining projects. Key terms in the annexes have not been translated appropriately. Deficiencies in the consultation materials impede the issuing of this statement.

The waters discharged from the mining project into the Natura 2000 area must be monitored extensively, and the frequency and timing of the monitoring must be selected in such a way that an acceptable level of reliability and monitoring can be achieved. Concentration limits and maximum annual load limits must be determined for the wastewaters of the mining projects. Emissions (nutrients, metals) from the River Tornionjoki will travel into the Bothnian Bay. In order to achieve a good ecological and biological status in the Bothnian Bay by 2027, the amount of nutrients entering the bay should be reduced. Therefore, it is justified to set a maximum annual load limit for the Nunasvaara mining project. It should be taken into account that several other mining projects affecting the Tornionjoki river system are being planned.

The cumulative effects of the mining projects located in the Tornionjoki-Muonionjoki river basin should be assessed in accordance with Article 6.3 of the Habitats Directive (1992/43/EEC). The total cumulative concentrations of emissions should be determined as well as their absolute concentrations and the annual total amount of emissions. In addition, the pH changes should be calculated. The cumulative effects should be calculated according to the maximum annual pollution load of the mining projects.

Marine migratory fish populations around which diverse business activities and culture have developed are an important attraction in the Tornionjoki-Muonionjoki area. The annual economic value of salmon fishing in the Tornionjoki-Muonionjoki area has been measured at about EUR 10 million. In addition to salmon and trout, grayling and migratory whitefish are found in the river area. There is a valuable fishing culture around migratory whitefish, which has also been included on the national Inventory of living Heritage. Through these inventories, Finland implements the UNESCO Convention for the safeguarding of the intangible cultural Heritage.

The Tornionjoki-Muonionjoki river basin has become increasingly important for fishing and fishing tourism. The permit authority in Sweden should consider implementing a fisheries fee for the mining company for the duration of the basic operations, but also in case of possible risk situations. It should be possible to use the fisheries fee for harm prevention, measures to improve the state of the living environment in the target area and for research.

Natural Resources Institute of Finland. Reproducing fish stocks in the River Tornionjoki have great economic and recreational value both in the river valley and the Baltic Sea. The river system in Tornionjoki plays an important role as a breeding site for migratory whitefish, pelt, sea trout and Atlantic salmon. The potential impacts of the Nunasvaara mining project on the fishing industry in the Tornionjoki River system may cross state borders in three ways:

1) The impacts will change the living environment of fish from the Nunasvaara project area downstream in the River Tornionjoki, which means that the impacts will also extend to the border river and the river area on the Finnish side. The cumulative impacts of several mining projects planned for the Lappea-Perämeri river basin may cause heavy emissions, the impacts of which may extend to the Tornionjoki River.

2) The impacts are limited to the River Tornionjoki in Sweden and/or the vicinity of the project area. In this area, increasing migrating fish populations suffer from adverse effects and the harmful effects cross the national border when these fish migrate along the river and to the lower part of the River Tornionjoki.

3) As a result of mining activities, the River Tornionjoki will become less attractive as a tourist attraction for recreation and fishing.

Many of the documents related to the application only have summaries translated into Finnish, which restricts the critical evaluation of the conclusions made by the mining company and the detection of any deficiencies in the analyses. The environmental impact assessment should also include a description of the worst possible situation in which the risks causing significant impact are realized simultaneously.

The rise in the concentrations of harmful substances in the Tornionjoki River, as indicated in the table of the report, is in conflict with the verbal section of the report according to which

"water quality in the River Tornionjoki, downstream from the eastern brook, however, is not expected to have any effects". It is also unclear what the calculations are based on regarding the effects of untreated surplus water on the concentrations in the River Tornionjoki downstream from the outfall pipeline. Before the total mixing of surplus water into the water of the Tornionjoki River downstream from the outfall pipeline, it is likely that concentrations of emissions are much higher compared to the concentrations above the outfall pipeline.

It must be taken into account that not all harmful substance impact mechanisms in migratory fish are known. In the life cycle of fish, the spawning and small-juvenile stages are usually estimated to be the most sensitive to the effects of metals, but metal loading may also be detrimental to salmon spawning in the river. Metal emissions in the water may cause the spawning season of migratory fish to be interrupted.

Wastewater coming from the Nunasvaara mine through two ditches mixes unevenly with the water of the River Tornionjoki. Therefore, spawning salmon may show an avoidance reaction that causes a lack of exploitation of spawning sites nearby or upriver from the outfall pipeline.

In addition to the reports already completed, the Swedish EIA should include an assessment of the potential cumulative effects of emissions from other mining projects in the Nunasvaara and Tornionjoki river basin (Kaunisvaara and Hannukainen), which in practice concern the lower part of the Tornionjoki River (Lappea-Perämeri). During the mine's operation, the greatest environmental risk and the need for decontamination is caused by the storage of sand and waste rock on the ground. Efficient collection and undisturbed cleaning of seepage water is important in minimizing environmental impacts.

If the Nunasvaara mining project is granted a permit, very strict concentration limits for harmful substances must be set for the wastewater in order to minimize the risk of significant environmental impacts in the Tornionjoki river basin. A condition for granting a permit must be that particular attention is paid to preparing for exceptional situations in order to minimize environmental risks. The mining company should be required to collect comprehensive monitoring data on changes in the recreational fishing of migratory fish in the Tornionjoki river basin and the attractiveness of fishing tourism in the river basin.

If the project has cross-border environmental impacts, it should primarily be possible to remove the environmental impacts quickly and permanently. Compensation for any damages should be provided only secondarily. The mining company must fully compensate for any damages caused by the project to the recreational value of fishing or the fishing industry.

***The Finnish Association for Nature Conservation*.** The mining project is contrary to the EU Water Framework Directive and the agreement on transboundary watercourses between Finland and Sweden. The impacts to nature and watercourses in the area have not been studied thoroughly enough, and the project must be fully rejected or returned for preparation. The project must not be carried out due to the risk of pollution to water and nature.

Reindeer Herders' Association. The Swedish EIA report does not assess the impacts on reindeer husbandry on the Finnish side. Reindeer from the reindeer-herding cooperative in the project area are not very likely to migrate to Finland, but it is not impossible.

If the water in River Torniojoki becomes polluted or there is a wider change in the environment, this could have indirect impacts on the Finnish reindeer husbandry through a general decline in the state of the environment. Any harmful effects on reindeer husbandry should be prevented and minimized in cooperation with the reindeer herding community in the area.

***Joint Property Management Association of the Water Area of Kukkola*.** The mining project must not in any way weaken the quality of water in the River Tornionjoki. All possible chemical residues must be removed from the wastewater leaving the mine. The River Tornionjoki is the best salmon river in Europe, and its water quality must not deteriorate. Extremely strict operating and monitoring procedures need to be implemented and there needs to be immediate notification of any disturbances that may have an impact on the river system.