

Oil Extraction & Sustainable Development on Sakhalin: a Local NGO Perspective (Sakhalin II Project Case Study)

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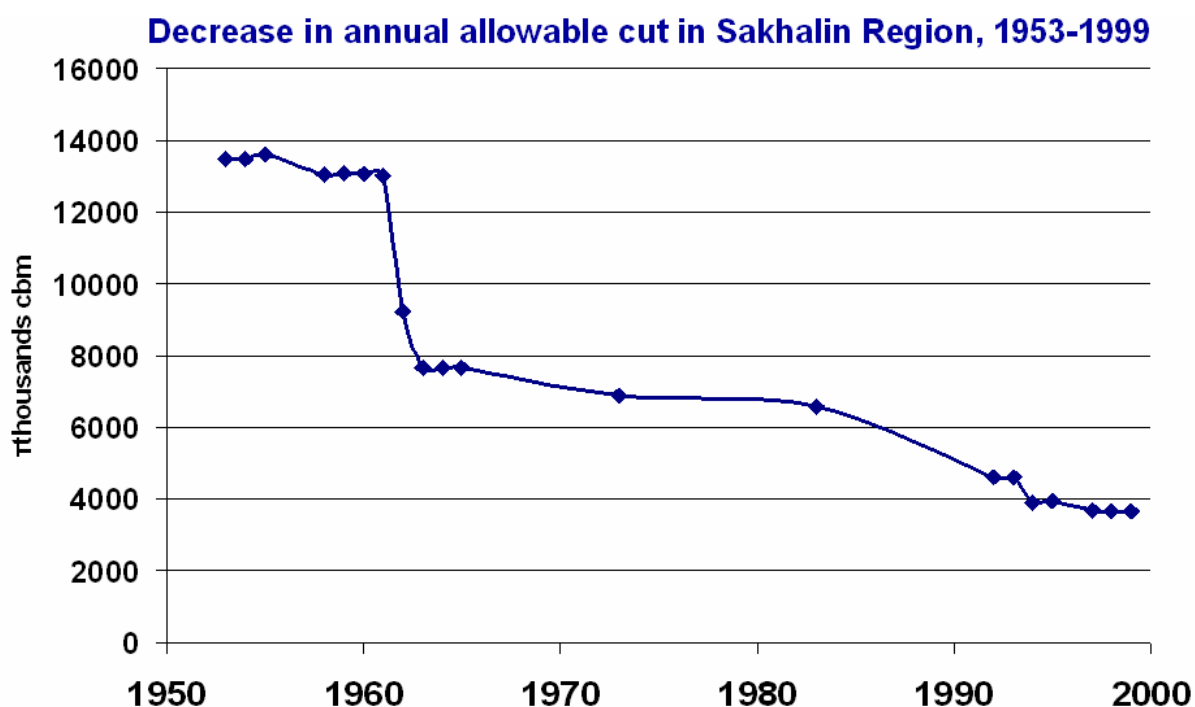
The NGO Sakhalin Environment Watch (SEW) is based in Yuzhno-Sakhalinsk, the administrative centre of Sakhalin *Oblast* (Region), and has seven permanent staff and about 30 volunteers. SEW was set up as an informal group in 1995 and was officially registered as an NGO in 1997. The organisation's main priorities are: (1) protection and preservation of Sakhalin's forests and promotion of their sustainable use; (2) protection of existing protected areas and creation of new ones; and (3) increasing the ecological security of Sakhalin's oil and gas industry. Since 1997, SEW has been carrying out public monitoring of Sakhalin's offshore oil and gas projects, including the Sakhalin II project (Sakhalin Energy/Shell). In 1999 SEW also started to monitor Sakhalin's existing onshore oil and gas industry, which has been in existence for over 70 years. Since 2003 the organisation has been addressing urban ecological problems in Yuzhno-Sakhalinsk itself, mainly related to waste, air pollution, and greening of the town (by tree planting). SEW has always been concerned about the sustainable development of Sakhalin. We have never wanted to make Sakhalin into a big nature reserve – the interests of the local population are our main priority; the interests of Wild Nature come second. We have therefore always paid special attention to two main natural resources – forests and fish – because in our opinion, it is these two resources that most closely meet the requirements of sustainable development. On Sakhalin, these resources are very closely linked – SEW has even published a book entitled 'Forest and Salmon'. So why do we focus on these resources in particular? In order to answer this question I will first of all try to explain briefly the foundation of Sakhalin's economy and indeed the lives of its communities.

Sakhalin's economy has always been and remains to this day a resource economy. A key role is played by natural resources: **oil and gas, coal, timber and fish**. These five resources fall neatly into two categories: renewable and non-renewable resources. SEW believes strongly that in the long- and even medium-term, development based on NON-renewable resources cannot be sustainable by definition. We can expect the future of the current population of Sakhalin residents to be supported by oil, gas and coal, but the future of our grandchildren will not. This is partly because supplies of oil, gas and coal are limited, but we are also convinced that opportunities for using these resources (and consequently development opportunities) will decrease before the resources themselves are depleted. The main reason for this is global climate change, the related shifts in global public consciousness and efforts to reduce fossil fuel consumption. This is the main reason why we believe that the preservation of forests and fish is critically important for the long-term future development of Sakhalin. *There is*

another very important reason why in our opinion it is very important to preserve these renewable resources, not only for the future, but also for the present. I explain this in more detail below.

First of all, a few words about Sakhalin's forests. Unfortunately, unsustainable use of timber resources over the past 130 years or so means that today the forests play a considerably lesser role in the life of the region than they did in the past. The clearest illustration of this is the following diagram:

Figure: Intensive Use of Sakhalin Forest Resources in the 20th Century



AAC in region was: in 1953г. - 13,5 mln м3
in 1999г. - 3,6 mln. м3

**decrease of 74%
in 46 years!**



The above diagram shows the change in the 'annual allowable cut', which is the annual volume of timber that it is permitted to log in the region. Between 1953 and 1999 this vitally important resource indicator shrank from 13.5 million cub.m. to just 3.6 million cub.m. Today the annual allowable cut is 3.4 million cub.m. And there is no evidence to believe that this tendency is going to change in the forest sector: it is more than likely that the annual allowable cut will decrease further. Tax payments from the forest sector account for just 0.2% of the Sakhalin regional budget. Employment in the forest sector has also decreased dramatically, from 23.2% (of total employment in production) in 1990, when it was the biggest employer, to 8% in 2000. Today about 4900 people are employed in the forest sector out of a total regional population of 532,000. However, the ecological significance of the forests has not in any way diminished, and this significance only increases as the forests decrease in size. In contrast to oil or coal, forests play a vital role in supporting a healthy environment for the human population – another reason why forest preservation and regeneration is so important.

Sakhalin's forests also have immense value for the preservation of salmon, a vitally important fish species. The role of fish and other marine biological resources is becoming more and more significant to the Sakhalin economy and the lives of the local populations. The fishing industry is the biggest employer in the region – 28.7% of the population was employed in this sector in 2000, compared to 21.3% in 1990. It is worth noting that the official statistics do not count part time and seasonal workers, who number many times more than permanent workers, or the large number of people employed in industries closely linked to the fishing industry, such as transport, boat repair and trade. The fishing industry contributed 10.5% to the Sakhalin regional budget in 2004, only a little less than the contribution of the oil and gas industry (12%). The Sakhalin Regional Administration recently made a strategic decision to direct the general course of the region's economic development towards use of marine and riparian bioresources, with a particular emphasis on reproduction. We share the opinion of the Sakhalin Administration that the fishing industry is critically important for the development of Sakhalin, and we believe it is impossible to support this sector without fish preservation, regeneration and breeding programmes.

Of course the fishing sector and the resources on which it is based, are experiencing considerable problems, including poaching, over-fishing, poor management, a lack of government support, corruption, and the absence of long-term rights to commercial fishing grounds. However, since the Sakhalin offshore oil and gas projects started up, an additional threat to fisheries now threatens to overshadow all others: the new oil and gas infrastructure constructed by the Sakhalin I and II projects. The 'pilot project' of these is Sakhalin II, whose operator is Sakhalin Energy Investment Company Ltd., a consortium of Shell, Mitsui and Mitsubishi. Phase 1 of Sakhalin II started in 1998, with the installation of the first marine platform, Molikpaq. Together with the floating storage and offloading vessel, named Okha, this platform made up the oil production complex 'Vityaz'. During the ice-free period (about six months per year), export tankers started to offload oil from here to transport to southeast Asian markets. Drilling started immediately after installation of the platform and in June 1999 the Sakhalin II project extracted its first oil. *From the start of this drilling activity there have been some very disturbing observations.* Despite many promises to do everything to preserve the environment and 'be good citizens', at the end of 1998 Sakhalin Energy started not only commercial drilling, but also discharging toxic drilling wastes into the sea, which is forbidden by a whole series of Russian laws and normative acts. In total, over three years more than 70,000 tonnes of poisonous waste was discharged into the sea, including mercury, lead, cadmium, arsenic, biocides, synthetic surfactants (used to disperse oil), radioactive additives, and oil products. This volume of waste is comparable to a reservoir the area of a football pitch and the height of a four-storey house. What is more, technology already exists to avoid discharging these wastes into the sea: this is re-injection – pumping the waste into deep geological formations. Sakhalin Energy refused our demands for them to use this technology, stating the platform did not have the technical capacity to do this. However, under public pressure, they have been forced to start re-injecting at least 70% of their drilling wastes from that same platform starting from the second stage of drilling in 2003.

In June 1999 about 5000 tonnes of Pacific herring perished en masse in Piltun Bay, a shallow bay linked to the sea by a small channel close to the Molikpaq platform. Local residents do not remember anything like this happening previously in the local area and officials could give no clear explanation of the tragedy. Independent analysis of the fish carried out by NGOs demonstrated that it contained high quantities of fresh oil, components of the drilling wastes discharged by Molikpaq (in particular, barium) and synthetic surfactants. Oil from every oil resource has its own unique composition and characteristics, and there are methods to determine which oil field a sample of oil has come from. In the case of the Piltun herring, identification of the pollution source would require analysis of a sample of oil from Molikpaq and comparison with the oil from the fish samples. However, Sakhalin Energy refused to provide an oil sample for identification when asked to do so by Sakhalin Environment Watch: the question of what caused the mass death of the herring has been left unresolved. Catches of herring in Piltun Bay and other bays of northeastern Sakhalin have since declined dramatically.

In September 1999, directly after the start of regular oil transportation by tanker, there was an oil spill from Molikpaq, when up to 1.5 tonnes of oil flowed into the sea after the mooring cables and the flexible pipeline for pumping oil into the storage tanker Okha snapped. Sakhalin Energy made no public statement about the cause of this accident. Instead, the company made every effort not to allow any information about any spills or accidents out from that moment on. This strategy has yielded its fruits – government officials and the public have a more than rosy impression of the project. The company regularly reports on the complete absence of any spills from Molikpaq and even promotes itself as world leader in terms of not having any spills. However, workers on the platform and fishermen working in the same area continuously report periodic incidents of oil pollution. For example in 2000, fishermen on the fishing boat 'Imchin' belonging to the Vostok fishing collective in Nogliki, observed an oil spill several kilometres long close to Molikpaq. SEW receives many verbal reports of this nature. However, fishermen and in particular workers on the platform do not want to make official witness statements, as they are afraid of the consequences. And in the absence of any documentation, government organs cannot carry out official investigations. Since the installation of the platform and the start of drilling operations, catches of saffron cod in the coastal waters of northeastern Sakhalin started to decline. Saffron cod is a very important catch for coastal fishing and a very important winter food resource for the local indigenous population, the Nivkhi. Just four years after the start of drilling the local fishing collective could catch only 25% of their permitted quotas. Catches of saffron cod decreased from 211 tonnes in 1998 to 25 tonnes in 2002. In addition, in all other areas where this fish is caught (the northeastern coastal waters, Aleksandrovska coastal waters, Terpeniya Bay and southeastern Sakhalin) catches have remained at the same level. In 2000-2001 SEW carried out a survey of fishermen and indigenous residents, in order to gather maximal detailed information on the problem of the decline in saffron cod stocks. In the course of this research we also discovered that many residents of northeastern Sakhalin are encountering fish pollution more and more frequently. SEW has received many complaints about fish that smells (or tastes) of oil, kerosene, 'medicine' or 'some kind of chemical'. Many indigenous residents told us that sometimes in winter they have to throw away the fish that they caught and prepared in summer, because it is simply impossible

to eat. But more often, if the strange smell and taste is not too strong, they have to eat that fish, as they simply can't do without it and they don't have any clean fish to eat.

Without doubt, the death of the herring, the decline of saffron cod catches, the strange oil and chemical smells and taste of the fish, and the oil spills from Molikpaq – these are all questions that need serious independent research and monitoring on the part of government and scientific organisations. However, no independent research has been carried out and monitoring is very weak, despite the fact that Sakhalin's Native residents have more than once turned to the Sakhalin Regional Administration with a request to carry out special research into the decline in saffron cod catches.

It is important to stress that all the ecological problems and threats described above, have an impact first and foremost on fishing, the most important sector of Sakhalin's economy and the one that most closely fits with the goals of sustainable development. *Even so, all the problems described above, which present considerable risks for the fishing economy and traditional fishing-based livelihoods of local people, may appear minor compared with the considerably greater threats posed by Phase 2 of the Sakhalin II project, which will impact not only the northeast, but the whole island and its waters.* Phase 2 of the project includes construction of two additional marine platforms, underground pipelines from the platform to the shore, a huge complex to process oil and gas next to Lunsky Bay in the northeast, two 800km pipelines (for oil and gas), and, in the south of the island, the biggest Liquefied Natural Gas (LNG) plant in the world, and an oil export terminal, two large moorings in Aniva Bay and finally tanker transportation of oil and LNG across Aniva Bay and the La Perouse Straits. To what extent could all of this threaten the Sakhalin fish resources and the fishing industry itself?

I will only linger on one type of impact – construction of the two underground pipelines, that will cross 1103 rivers and streams, about 800 of which are spawning grounds for wild salmon, and some of which have salmon hatcheries. Sakhalin Energy took the decision to use the trench method for crossing rivers with the pipelines. This involves digging a channel across the river, laying the pipe and filling it in with earth. They will only use horizontal drilling to lay the pipe under seven of the rivers. This decision was taken despite the demands of NGOs, who suggested that, in the light of Sakhalin's extremely complex natural conditions (the dense network of spawning rivers, rugged relief, marshes, mountains, the possibility of mudflows, avalanches and landslides, and the region's high seismicity) all pipelines should be constructed above ground, including the river crossings. This approach was taken 25 years ago in Alaska to construct the famous Transalaskan pipeline and to this day that pipeline has consistently demonstrated a high degree of safety.

As of early 2005, almost half of the Sakhalin II project oil pipeline has been constructed, and construction of the gas pipeline has begun. Officially, crossings of spawning rivers started only in October 2004, however, a huge impact on the rivers is accompanying the construction from the very start. Despite the company's promises to control the process, facts demonstrate the opposite is the case. During rains and thaws, enormous amounts of mud have been falling into the spawning rivers

from the very start of the pipeline construction. All of this must have damaged the salmon resources, as it has been scientifically proven that salmon avoid rivers with turbid waters. This means that when the salmon swam to their spawning grounds in summer 2004 (at the very height of construction activity), rivers that fell into the zone of impact had a very small chance of being filled with fish and providing normal reproduction. In May 2005 when the young salmon descend the rivers, we should see how the pipeline construction has impacted on salmon reproduction. However, there is very little hope of independent state organs carrying out this kind of monitoring research. If such research were carried out by Sakhalin Energy themselves, the results could be predicted. As company reports usually state in such situations 'the impact was short-term and insignificant, the bioresources were not affected'.

In winter 2004, Sakhalin Energy started large-scale construction of the trench river crossings. However, we have not been able to locate accurate information on the number of river crossings already constructed. Salmon roe laid in summer 2004 in the rivers across which pipelines were constructed in winter are in great danger. Silting up of the river-bed due to the construction work results in the increased mortality of the developing salmon embryos and of the river biota which in May become food for the young salmon. *However, an even greater threat is posed by the operation of the oil pipeline over an expected 25 years.* Considering the high seismicity of the construction zone and the 21 active tectonic breaks that will be crossed by the oil pipeline, it is inevitable that there will be major and minor pipeline leaks. If the pipeline were laid above land, as in Alaska, any leak would be noticed and dealt with very quickly and effectively. Leaks from an underground pipeline, especially minor ones (lower than the sensitivity of the detection apparatus) are very difficult to detect. It is very hard to clean up an underground leak, and practically impossible if the oil has been underground any length of time and has started to seep through the subsurface waters. Minor leaks that are long lasting could create chronic migrating underground oil spills. As a result, oil will unavoidably get into spawning rivers and subsurface waters and gradually poison the salmon. American scientists researching the consequences of the Exxon Valdez spill in Alaska established that oil starts to have a negative impact on pink salmon roe even at miniscule volumes (one part to a billion parts of water), resulting in increased mortality and developmental defects. The likelihood of underwater leaks will increase as time passes due to the ageing of the pipeline metal. Today the only reliable method of locating a leak in an underground pipeline is to pass through it a special apparatus known as a 'pig'. Sakhalin Energy plans to do this no more than once every five years.

In the course of discussions about pipeline construction methods, in response to public demands for above ground pipelines and construction of bridge crossings across rivers the company usually offers the following arguments:

- 1) *'Above ground pipelines will become the focus of vandalism.'* However, the pipelines of the Russian oil company Rosneft have existed in northern Sakhalin for decades, with many above ground sections, including bridge crossings across rivers. Not one case of vandalism has yet been reported.

- 2) *'Bridge crossings across rivers will be in danger during flooding.'* However, this problem can easily be resolved if maximum floodwater levels are established and crossings are designed at a sufficient height to avoid this danger.
- 3) *'Above ground pipelines and bridge crossings do not look aesthetically pleasing: the company does not want to spoil the surrounding landscape.'* Sakhalin residents usually laugh at this argument. They consider that spoiled fish is a lot worse than a spoiled view from the window.

Ultimately the company could easily elicit Sakhalin residents' opinions of various pipeline options via a sociological survey. The result would be unanimous – people would want the safest option, even if it is less aesthetically pleasing.

However, it is evident that the main reason for choosing the trench river crossings is because they are considerably cheaper than the bridge crossings. Sakhalin Energy is simply trying to economise and make life easier for itself in the future, making monitoring of leaks harder for the government and the public. The underground oil pipeline poses a great threat to the salmon, related to the long-term damage to its populations. Fishing throughout the Sakhalin region therefore faces a considerable risk. All the island's coastlines are divided into a string of small fishing grounds, belonging to hundreds of large and small companies. Many of these reinvest their profit in business development, use credit (despite high interest rates), and build freezers and processing plants, attracting more of the local population into the production process. Every other year (odd numbered years, when the catch is greater) Sakhalin's overall salmon catch reaches 110,000 tonnes. Sakhalin salmon caviare is sold (and is valued) in more than ten countries. The annual salmon run, from the coast to the spawning grounds upriver, is a sacred event anticipated impatiently by the whole island. The great Sakhalin festival, Fishermen's Day, takes place at the start of the salmon run. But the salmon's homing instinct depends on its production in a specific district, a specific river. And if the fish does not enter a river because of its turbidity one year, then two years later the enterprise whose fishing grounds are located close to that river estuary will simply have nothing to catch: unborn generations will not return.

Other threats to fishing from the Sakhalin II project include: the construction of moorings in Aniva Bay; the high likelihood of a catastrophic oil spill from a tanker; discharge of polluting drilling wastes from the LNG plant into the sea; ongoing discharge of drilling wastes into the sea from the Molikpaq platform and future discharge from the two new marine platforms. I will now discuss these threats briefly.

During construction of the moorings for the Oil Export Terminal (OET) in Aniva Bay, Sakhalin Energy needs to dig out part of the sea bed and plans to discharge around 1.5 million cubic metres of this earth in the middle of the Bay at a depth of 63 m. This is an enormous volume, enough to create an underwater mountain, but Sakhalin Energy assures us that only an insignificant part of the sea floor will be impacted, i.e. the area covered by the base of this mountain. However, the problem lies in the fact that there won't be a mountain – most of the earth will be swept all around the Bay by the currents. When earth is discharged into water, the water becomes very turbid, which destroys light,

oxygen and temperature regimes, as well as several other physical characteristics of the water. All this has a negative impact on the plankton – the foundation of marine life – impacting vast quantities of larvae and roe belonging to a whole range of important commercial species such as pollack. Large volumes of earth have a destructive impact on the biological communities of the sea floor, and in particular on important commercial species such as crab. Aniva Bay is critically important for strigun crab. This is where you find its largest spawning grounds, and the areas where the young grow up and from where they spread across the entire southern Okhotsk Sea. Independent specialists are convinced that a thick layer of sediment will cover a huge part of the sea floor of Aniva Bay.

In winter 2003-2004, Sakhalin Energy carried out dredging work for the construction of the temporary moorings for offloading equipment in Aniva Bay. Around 150,000 tonnes of earth were dug up and discharged into the Bay. And by May the local fishermen were already observing a thick layer of an unusual grey sediment covering seaweed along the coast close to the village of Tretya Pad – nearly 40km from where the earth had been discharged. In January 2005 a group of local residents together with Sakhalin Environment Watch managed to go through the courts where the construction of the temporary moorings was declared illegal. Sakhalin Energy started dredging for the LNG moorings at the end of March 2005, with a huge impact and considerable local protest (see <http://www.sakhalin.environment.ru>). There is a simple alternative to discharging earth into Aniva Bay – this is to transport it a few kilometres further and discharge it in the open sea at a depth of more than 1000m, in an area with less biological activity and where the impact on bioresources would be considerably smaller. The only reason Sakhalin Energy does not want to do this is because they want to keep costs down. In addition, Sakhalin Energy is proposing to discharge into Aniva Bay 532,000 cubic meters of sewage (containing oil) from the LNG plant, the oil terminal and accompanying facilities. The Company has promised to clean the sewage to the required standards. However, the company could in fact entirely avoid discharge into the sea and instead clean the water for technical use in the plant, which needs very high volumes of water.

Starting in 2007, up to 8 million tonnes of oil will be loaded annually by tanker from the export terminal in Aniva Bay. The most dangerous part of the route for all tankers will be the La Perouse Strait (between Sakhalin and Hokkaido, northern Japan), well known for its difficult and dangerous navigational conditions. One of the reefs in the middle of this strait is even called ‘the Stone of Danger’. Here there are powerful currents and regular typhoons. In winter the strait is often blocked by heavy ice. Fishing boats move around here all year round, and many of them bring their production into Aniva Bay. It is not uncommon for trading and fishing boats to get into dangerous situations in the La Perouse Strait, due to the ice conditions or other factors.

In the Phase 2 project materials Sakhalin Energy modelled 14,390 oil spill scenarios for spills of up to 3000 tonnes, but only for Aniva Bay. La Perouse Strait is the most dangerous place in Sakhalin’s whole ‘oil chain’ and is not even included. The modelling demonstrated that an oil slick is most likely to reach the shore in the first 24 hours after the accident. The danger is greater due to the closed nature

of the Bay's waters and the system of internal marine currents, which circle all around the Bay. This factor may increase the damage to the ecosystem and bioresources, as the spilled oil will not be distributed across the ocean, but will remain in the Bay for a long time, poisoning the marine environment and the shore. The oil spill scenarios that Sakhalin Energy completed related only to the oil export terminal, while the tankers – the most risky part of the transport chain – were not even considered. Yet a tanker accident represents a considerably greater risk than one at the oil export terminal. World experience demonstrates that in many cases when a tanker has an accident, the volume of oil spilled considerably exceeds 3000 tonnes.

Significantly, Sakhalin Energy did not include in its oil spill response plan anything at all relating to tankers, or indeed any transport operations at sea. Instead, when necessary the company periodically gives vague promises to do everything possible to liquidate a tanker spill should it occur. However, nowhere is it documented (or therefore legally established) which forces and resources will be drawn upon to clean up tanker spills, what will be the time frame and procedure, who will be responsible, and thousands of other questions which should be addressed in a normal oil spill response plan. And the Company has never had a serious attitude to possible oil spills related to other forms of marine transportation and has not mentioned them in any form of documentation. And as recent events demonstrated, this is entirely the wrong approach. In September 2004 the incident with the dredger 'Christopher Columbus' became a disastrous test for Sakhalin Energy's oil spill response plan. The vessel, chartered for the construction of the underwater pipeline to the Lunscoe reserves in the northeast, was situated in the Kholmsk Port in the southwest, when the powerful typhoon 'Songda' threw it up on shore right up against the main boulevard, practically in the centre of town. Around 200 tonnes of heavy fuel oil spilled out into the sea. While part of the oil was washed onshore, covering about 5km of the town beach, most of the oil remained in the sea. Unexpectedly for the public, it transpired that Sakhalin Energy's corporate oil spill response plan for Phase 2 of the Sakhalin II project not only did not include marine transportation operations, but was still only in draft form and was yet to be finalised and approved.

Sakhalin Energy's practical response demonstrated that the company was not in the least bit prepared for such an incident. Despite the fact that Russian legislation contains clear requirements, such as being prepared to clean up a spill at sea within four hours after such an incident, the company could do nothing to clean it up and didn't even try to do it. Their special oil spill response vessel did not appear. Forty-eight hours after the incident, fuel from the damaged tanks was still flowing out. And this flow was halted not by company specialists, but a Russian rescue organisation. The onshore clean-up started only 14 hours after the accident, initiated not by Sakhalin Energy, but by the local authorities. At the time of the incident, the company's resources were located 600km to the north and were brought to the site only four days later, when they weren't needed any more – the oil long since been dispersed by the waves. The skimmers and the boats remained standing on the shore. It is scary to imagine what would have happened if this had been not the dredger, but a tanker full of oil. Of course, it is not very realistic in Kholmsk, as this is not on one of the tanker routes, but it is very likely for Aniva

Bay. One could say with absolute confidence that a tanker accident of the type that occurred to 'Christopher Columbus' would be a complete catastrophe for fishing. And world experience of tanker transportation demonstrates that for any large terminal or permanent transportation route, a large spill is only a matter of time.

To complete this far from comprehensive overview, we need to return to what we started with – to sustainable development. Unfortunately, prospects look grim for sustainable development in the context of the Sakhalin II project. An important, though not the main, reason for this is the reluctance of Sakhalin Energy to use the best technology and make the safest project decisions, and the determination of their managers to economise on nature protection measures. Other key factors are the extremely weak and inadequate government control and the absence of independent scientific monitoring of the impact on the natural environment. All this leaves fishing – the sector most closely associated with sustainable development – with very few chances to develop.

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Translated by Emma Wilson