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Order of Appearances

Northern Gateway Panel 2 - Prince Rupert

Marine Emergency Preparedness & Response

Mr. John Carruthers	Mr. Randy Belore	Mr. Jeffrey Green
Dr. Alan Maki	Mr. Owen McHugh	Mr. Greg Milne
Mr. Jon Moore	Dr. Edward Owens	Dr. Walter Pearson
Dr. Jack Ruitenbeek	Dr. Malcolm Stephenson	Mr. John Thompson
Mr. Chris Wooley	Mr. Dennis Yee	

Examination by Mr. Jesse McCormick for Haisla Nation (continued)

10618

Touching on preliminary matters that arose prior to his examination and on the previous day, Mr. McCormick asked for clarification on the circumstances in which NGP will use MSDS sheets from shippers.

Health risks of inhaled chemicals

Turning to the subject of human health risks from terminal spills, Mr. McCormick asked for agreement that NGP acknowledged the risk of exposure to carcinogenic and non-carcinogenic chemicals through the air. Mr. Yee answered that the risks of carcinogenic

effects “would be extremely low”, but that “we’d be more concerned about the non-carcinogenic effects”. 10627-10631

Mr. McCormick pulled up Exhibit B9-2, page 21, a model of possible pathways of exposure to condensate volatiles for the terminal operations. Discussion turned to potential effects from volatilization of condensate. Mr. McCormick also pulled up the TDR risk assessment in Exhibit B16-33, which finds that within 30 minutes, 52 percent of a modelled condensate spilled would have evaporated. Mr. Belore spoke about the factors affecting the evaporation rate such as temperature and wind speed. 10633

Mr. McCormick noted that despite 52 percent of a modelled condensate spill being volatized, NGP’s spill risk assessment at the Terminal does not consider health effects from inhaled condensate from the atmosphere. Dr. Stephenson responded that a separate risk assessment spoke about the fate and risks of vapour clouds from a spill at the terminal. Mr. McCormick asked if the results of that assessment were integrated into hypothetical spills at the Terminal. Mr. Yee confirmed that they were not. 10658

Turning to page 17 of the Exhibit, Mr. McCormick asked detailed questions about various parameters in NGP’s “Conservative Assumptions in the Exposure Assessment”. See transcript for details. 10662

Continuing on the subject, Mr. McCormick asked if NGP agreed “metabolization of COPCs may result in adverse effects on human health”. Mr. Yee answered that he agreed, though noted that the toxicity benchmarks used in the assessment need to be considered, which take into account the same metabolic considerations. Discussion continued around NGP’s position on genotoxicological effects of COPCs, and how such effects and others were accounted for in the health risk assessment. 10702

Discussion continued about whether or not NGP underestimated health effects. 10728

Health effects related to consumption of country foods following oil spills

Again calling up Exhibit B16-33, page 71, Mr. McCormick asked about NGP’s use of a Health Canada study on Aboriginal fish consumption, for its own assessment. Mr. Yee indicated that the study’s values “are recommended by Health Canada for assessment of First Nations ingestion rates of country foods.” Mr. McCormick sought an understanding of how applicable the values are to First Nations communities, and which communities were assessed in the study. 10740-10752

Mr. Yee answered that NGP did not confirm that the consumption rates in the study are accurate for the Haisla Nation and discussion on the matter continued, with Mr. Yee stating, “*at the end of the day, the risks are such that they are so low that it does not bear any real concern.*” Discussion continued in regards to the accuracy of the study given the assumptions made about First Nations diets, and the extent to which NGP sought consumption data from First Nations. 10754-10799

Turning to page 70, Mr. McCormick asked about the likelihood of persistent contamination to fish tissues. Dr. Pearson explained that fish metabolize hydrocarbons

"very effectively… so they don't accumulate them and keep them as they would with persistent organic contaminants such as PCBs but, in fact, they clear them, break them down, excrete them from their systems very quickly... the closures of fisheries for fin fish tend to be a very short duration. They're usually precautionary. And it's usually confirmed very quickly that there is, in fact, no real risk due to contamination of fish." 10801-10808

Mr. McCormick asked about the assumptions made around length of toxin exposure time in table 3-2, Receptor Characteristics and Behaviours for Exposure Modelling. Dr. Stephenson provided details. 10811

Turning to Exhibit B38-9, page 15, Mr. McCormick asked about the assumptions made in regards to health effects from ingestion of contaminated seaweed. Similar discussion ensued, with Mr. Wooley explaining that food safety testing for PAHs after the Valdez and Selendang Ayu spills showed low risks of PAH levels in shellfish. He agreed that such studies were short-term studies only. Mr. Yee indicated that he was not aware of any long-term epidemiological studies of consumption of contaminated shellfish. 10828

Dr. Stephenson again explained that following oil spills, seafood consumption bans are usually put in place as a precautionary measure, stating, "*there are a couple of exceptions where longer-term persistence of and sediment has created situations where seafood consumption advisories have been more persistent, but those were exceptional circumstances*." 10851-10853

Similar discussion ensued. Dr. Pearson pointed out that assessments of contaminated fish tend to be short because they stop once the resource is identified as being safe for consumption. 10854

Mr. McCormick asked if NGP is aware that many members of the Haisla nation had been exposed to PAHs from contaminated shellfish and crustaceans from aluminum smelters. Dr. Stephenson pointed out that the aluminum smelter contamination involves a different class of PAHs, which contain larger quantities of carcinogens. 10868

Mr. McCormick asked if NGP was aware of concerns within the Haisla Nation related to higher fatal cancers in younger members of the population. Mr. Yee answered, "we're not aware of any studies to that effect." Dr. Maki explained the difference between toxicological effects of PAHs from hydrocarbons as opposed to those produced by smelter and other forms of combustion. 10875-10881

Mr. McCormick again called up Exhibit B16-33, page 74 and asked about subsection 3.4.2, Assumptions in the Toxicity Assessment. Mr. Yee agreed that because the assessment relies on animal models, there is uncertainty about the expected effects on humans. He went on to explain that the toxic reference values used in the assessment are derived by government agencies, who determine what values are suitable to define the protection of human health. 10882

Mr. McCormick asked if any of the toxicity studies involved testing animals that have similar life spans to humans. Mr. Yee explained that non-carcinogenic effects testing on an animal as long-lived as humans would be "uneconomical", but that for carcinogenic effects, studies typically involve the lifespan of mice or rats, in the order of 2 years. He went on to describe the high financial costs of such studies. 10902

Mr. McCormick asked if NGP expected that its human health risk assessment would instil confidence in the Haisla Nation that the foods it is reliant upon would be safe for consumption following a dilbit or condensate spill. Mr. Green answered that the purpose of the study wasn't to demonstrate food safety, but to look at potential risk. He spoke about NGP's commitments to conduct further environmental quality and harvest studies. 109011

Noting NGP's position that consumption of some country foods will not pose health risks following a spill, Mr. McCormick asked if NGP expected that Haisla Nation members would continue to consume such foods at the same rates they do now, if a spill were to occur. Dr. Stephenson answered that the decision of whether or not to harvest resources lies with individuals, and that in the event of a spill, NGP would provide information about contamination to inform such decisions. Discussion continued on the course of events that would take place to inform communities about health risks following a spill, with Mr. Thompson indicating that NGP intends to set up a community-based response strategy in advance of an event. 10928

Mr. McCormick asked if NGP was asking the Haisla Nation to assume the risks associated with the consumption of seafood contaminated by a spill. Mr. Green again spoke about the intention to work with communities to ensure that food is acceptable. Discussion continued in regards to the differing diets between NGP workers and Haisla Nation members. 10955

Calling up a report on the Valdez spill, Mr. McCormick asked for agreement that the spill had significant impacts on subsistence harvesting of indigenous people. Mr. Wooley agreed that the spill interrupted subsistence harvesting particularly in the Prince William Sound area. He disagreed with an excerpt from the report, which indicated that people had to avoid traditional food and turn to high-priced groceries; and that "*recreational use was mostly shut down and the world-wide image of Prince William Sound as a pristine ecosystem was tarnished with oil.*" 10989-11001

Discussion continued in regards to the witnesses' thoughts on impacts to traditional food resources as a result of an oil spill, and the health impacts to First Nations as a result of having dietary changes. 11002

Mr. McCormick pulled up another study called "Balancing risks in the management of contaminated First Nations fisheries." He asked for agreement with a statement about the inadequacy of focusing on direct risks of consumption of contaminated foods and that management measures themselves can pose risks. Dr. Stephenson spoke about the difference between dioxin contamination (which the study addresses) and petroleum hydrocarbons, which he stated are non-persistent. 11042

Highlighting another excerpt from the study, Mr. McCormick asked for agreement that dietary changes as a result of fisheries closures could result in risks to coronary disease. Mr. Wooley spoke about the importance of having community involvement to develop a model to assess the safety of country foods and properly communicate the findings of such a model. Dr. Stephenson added comments recognizing the risks of dietary changes, and noting the health advantages of country based diets which could "outweigh minor levels of contamination that might be present" 11069-11078

Mr. McCormick pulled up another study, titled 'Impacts of traditional food consumption advisories: compliance, changes in diet and loss of confidence in traditional foods". The witnesses again spoke about the difference between persistent organic pollutants resulting in long-term health advisories, and the expectation that an oil spill would result in minor, short-term advisories only. Discussion continued around the nutritional benefits of traditional foods. 11085

Mr. McCormick highlighted segments of the study, which point to the cultural impacts of food advisories including *"social, psychological, nutritional, economic and lifestyle disruption."* The study also points out that some communities have chosen to disregard consumption advisories, believing that the effects of consuming contaminated foods would be lower than the cultural effects of changing their diets. Mr. Wooley again pointed out the differing toxins being discussed in the study and agreed that long-term dietary changes would have a greater effect than what has been seen as a result of oil spills. 11103-11107

Discussion on the matter continued, and extended into the subject of compensation mechanisms for fisheries losses and interruptions to traditional foods. See transcript for details on the subject. 11108

Mr. McCormick asked about the witnesses' knowledge of the impacts to Haisla Nation members following the contamination to eulachon from pulp mill discharge, which required significant travel for alternative harvesting. 11149

Noting Mr. Green's comments in Volume 133, line 457, that NGP's environmental assessment relied on "credible and rea1istic scenarios", Mr. McCormick asked about NGP's understanding that there may be differing opinions of credible and realistic scenarios. Discussion on the matter continued. 11159-11174

Environment Canada's comments on NGP's spill modelling

Referring to Exhibit E9-6-32, page 30, Mr. McCormick asked for agreement that Environment Canada had criticized NGP's spill modelling, indicating that its failure to account for variability could mean that its model results are not representative of true spill outcomes. Mr. McHugh responded by describing the different approach to environmental assessment that NGP and EC have. He added, "*no amount of stochastic modeling would change the conclusions within the environmental assessment that, essentially, given the right conditions and the right spill, you could have significant effects.*" 11176-11192

Discussion continued as to whether or not NGP agreed that EC has a differing opinion as to what constitutes a worst-case scenario in spill modeling. 11194

Noting previous discussion on the matter in Volume 133, line 954, Mr. McCormick asked if NGP's position was that the entire coastline is susceptible to a potential oil spill. Mr. Green spoke about NGP's approach of focusing on understanding the potential effects of a spill in specific areas, noting, "*there is some probability that every segment within the Confined Channel Assessment Area could be contacted by oil*." 11212-11240

Mr. McCormick asked if Mr. Green was saying "*there is no safe space along the tanker route where oil could not reach, in the event of a spill*". Mr. Green responded, "*if you had the right wind, the right currents and the release point was at the right place at the right time, there is some chance… that areas along the CCAA could be exposed to some degree of oiling*." 11242-11244

Mr. McCormick asked what percentage of time NGP would not be able to launch an effective initial containment operation because of operational conditions. Mr. McHugh pulled up Exhibit B17-18, page 15, and explained that initial containment response *"can be accomplished under most conditions almost 100 percent of the time within the confined channel."* 11246

Discussion continued around Mr. McHugh's comments in Volume 134, line 2560, that 2 percent of the time NGP would not be able to launch initial containment operations, and the factors he considered in arriving at the figure of 2 percent. See transcript for detail. 11254

Motion brought forward by Dr. Wier 11339

Dr. Josette Wier brought forward a motion opposing the qualifications of Mr. Dennis Yee as an expert witness. "*He's the person who wrote "The Human Health Effect of Oil Spills" but I'm not finding in his qualifications enough to qualify him as an expert*." She objected to his qualification on the grounds that his last academic credential, a Masters degree in Biology, was from 1986, his publication record is sparse and not recent, and "*he worked for Stantec and that's what he did*." Mr. Langen rejected the motion and the arguments. After deliberation, the Chairperson of the Joint Review Panel, denied the motion. 11339-11383

Examination by Mr. Jesse McCormick for Haisla Nation (continued) 11403

NGP's response gap analysis and containment operations

Mr. McCormick again called up Volume 134, line 2802 and asked about Mr. McHugh's comments regarding the need to purchase equipment before doing a response gap analysis. Mr. McHugh spoke about the need to capture best available equipment in the project's analysis. Mr. McHugh asked if NGP could obtain specifications about equipment to inform a response gap analysis, prior to actually purchasing the equipment.

Dr. Owens pointed to previous discussion on the matter at line 2791, noting that enough information existed to enable NGP to proceed with its detailed planning process. 11404

Discussion continued around Enbridge's response equipment that could help inform NGP's spill response capabilities. Mr. Milne noted that Enbridge's equipment is designed for terrestrial pipelines, not marine response. Discussion continued around available information related to operational limitations of marine response equipment. Mr. McHugh confirmed that during the detailed design phase of the project, assessments will be conducted around operational limits. 11416

More on NGP's 2 percent limitation

Mr. McCormick asked further questions about Mr. McHugh's comments at line 2560 of Volume 134, in regards to potential limitations for launching effective initial containment operations. Discussion again turned to the factors used to determine the 2 percent period when containment operations would be beyond NGP's capacity, and the extent to which NGP understands limitations of various types of equipment. See transcript for detail. 11465-11517

Mr. McCormick asked if it were true that NGP had not completed an assessment of the standard limits for the various equipment being discussed, which had led to the 2 percent conclusion. Mr. McHugh answered, "*we did a preliminary assessment where you look at: what are the standard limits associated with these style of task force?*" Similar discussion continued. 11518-11547

Mr. McCormick asked for an undertaking from NGP to provide the quantitative and qualitative assessment used in the preliminary analysis that resulted in the 2 percent figure. Mr. McHugh answered, "*we've completed some preliminary analysis. So it's not in a state that would be appropriate to file*." Discussion on the matter continued and The Chairperson indicated that the undertaking was not necessary for the Panel. 11549-11575

More on NGP's spill response commitments

Mr. McCormick called up Volume 135, line 3907. He asked Dr. Owens about his comments on the "old ways" of responding to oil spills and how organizations have evolved past them. Dr. Owens described some of the old management systems and equipment used to respond to spills and how they have evolved through time. He also spoke about the opportunity being presented to build a responsible response organization, stating, "*this is a really amazing opportunity for us to bring together the best that we have learned over the ears and to present, as this project starts up, a really world-class operation.*" 11577-11588

Mr. McCormick asked if NGP already had a cost estimate for its proposed state-of-the-art response system. Mr. Carruthers answered that no hard numbers had been developed, and that much would depend on the outcome of the JRP. 11590

Mr. McCormick turned back to Volume 134, line 2925 and highlighted Mr. McHugh's comments with regards to night response at the Trans Mountain spill at Burrard Harbour.

Mr. McHugh discussed his experience at the spill and answered, "the principles associated with spill response remain the same no matter what the area is", adding that the response to a spill in the CCAA or Open Water Area "would look quite different" 11601-11608

Turning to line 2578, Mr. McCormick highlighted Dr. Owens' comments in regards to the challenges of recovering oil spills in the open ocean. He asked for agreement that such spills will result in toxicity to organisms. Dr. Stephenson agreed that oil on the water's surface is an environmental effect, and stated that a variety of factors would determine what types of effects spills would have. Dr. Owens added further comments. 11609

Calling up Exhibit B21-2, page 38, Mr. McCormick asked how NGP planned to contribute to the costs of spill response. Dr. Owens clarified that the response positions indicated in Figure 3-1 would be funded by the international and Canadian compensation agreements, not NGP. Mr. McCormick asked if the marine oil spill response plan would include positions for First Nations and local representatives and Dr. Owens answered that the expectation would be that representation from private and public stakeholders would be included. Discussion continued. 11636

The tiered response approach

Mr. McCormick turned to the Tiered Response Approach subsection, on page 26. He asked why it isn't necessary to determine what response tier is warranted prior to a spill event. Dr. Owens answered that the first steps in the event of a spill include scaling the problem to determine what resources are needed. He added further details of the aspects involved in the tiered response approach. 11658

Turning to page 27, Mr. McCormick asked about Table 1-3. Mr. McHugh provided details, indicating that the table provides a framework, or general policy, for the corporation to determine how to react to spills. Discussion on the application of the table and response methods continued. Please see transcript for further details. 11676

Noting that Table 1-3 describes a moderate risk of an incident escalating as a situation where "*control of incident may have deteriorated, but imminent control of the hazard…is probable*", Mr. McCormick asked for examples of incidences where control had deteriorated. Dr. Owens answered that the first line of defence in a spill is source control, and if the first line of defence is not successful, the second line of defence is turned to. 11730

Continuing on with Table 1-3, Mr. McCormick asked if NGP had developed criteria to determine whether an incident is considered to be under control. Mr. McHugh pointed out that the table applies to the General Oil Spill Response Plan, which covers all types of spills in all areas of the project, so that the wording in the tables won't be applicable in every situation. He noted that major marine events would likely be categorized as a Class 3 event, which would require mobilization of all response resources. 11735

Mr. McCormick continued to seek an understanding of how "under control" is determined. Mr. McHugh indicated, *"typically what control would mean is that you have the source contained within a facility or a certain set of booms, for example"*. 11739-11744

Behaviour of condensate

Mr. McCormick pulled up Exhibit B23-15, page 20 and asked about NGP's tests on the behaviour of condensate. He asked whether NGP acknowledged the variability in condensate composition and API gravity. Mr. McHugh answered that all condensate to be shipped by NGP "would be required to meet the specifications…which have been filed on the record", and that overall, the product is "fairly consistent" and would have "slight variations". 11747-11760

Mr. McCormick asked if condensate API levels determine evaporation and entrainment rates. Mr. Belore answered that differing API levels will affect evaporation rates of the product, and that condensate is generally quite light, so will be "highly evaporative". 11764

Discussion continued and Mr. Belore confirmed that evaporation and entrainment help predict fate and effects of spilled condensate. He also confirmed that NGP modelled only one condensate for the assessment, stating his opinion that other condensates produce similar results around evaporation and dispersion rates. 11768

NGP's use of scientific literature for its biophysical recovery report

Mr. McCormick called up NGP's biophysical recovery document, page 219. He asked about NGP's use of scientific literature, and its decision to avoid assessing the methods and statistical validity of the studies used. Dr. Pearson pointed out, "*it's very clear when you look at the literature… things are uneven in the literature. Some do a lot of work. Some use their best professional judgement."* Discussion continued around the data NGP used to reach its conclusions in regards to ecosystem recovery from spills. 11794

Dr. Pearson agreed that many of the studies used in NGP's report were prepared by consultants and were not peer-reviewed. He agreed that such reports may be less reliable and accurate. Discussion continued around NGP's identification and assessment of Valued Ecological Components (VECs). 11820

Mr. McCormick called up Exhibit B39-21, page 1, and asked which species listed on the page were included in the listed VECs in Table A.3 from page 224 of Exhibit B83-17 (previously discussed). Dr. Pearson was unable to provide the information and Mr. McCormick requested an undertaking to provide further information about the relevance of NGP's document on recovery of VECs from other spills around the world, and how it would be relevant to the specific geographic conditions of the project area. Discussion continued. 11857

Dr. Pearson explained that the rational of the recovery report was to understand the history of oil spills and their effects on ecosystems. He noted that NGP's study showed "*the body of the scientific literature supports the conclusion that ecosystems recover and*

does not support the conclusion that ecosystems do not recover." Dr. Maki added that many of the species studied "*serve as direct surrogates for the species that occur specifically in this geographic area.… the bottom line is, the recovery does proceed.*" 11885

Mr. McCormick continued with his request for details of the VECs assessed, in relation to the geographic region of the project. He noted the wide variety of recovery types of various habitat and species, and the need to understand the extent to which worldwide results will be pertinent for local conditions. Dr. Pearson explained that effort was made to ensure that the literature was filtered to include species relevant to the project area. 11896

Dr. Maki pointed out that the datasets used in NGP's report "*will show that there are very few direct species from this specific geographic area that are included, and that's actually a good thing, because there has been no history of oil spills in this area...however, for other similar cold tempered environments across the world, we have data where oil spills have occurred and we're using those as surrogates and indicators of what could potentially occur in this environment*." The Chairperson decided that the undertaking was not necessary for the Panel. 11912-11916