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## Order of Appearances

### Enbridge Northern Gateway Pipelines Panel #1

#### Pipeline and Terminal Design and Engineering Panel

Ray Doering	Peter Acton	Barry Callele
Drummon Cavers	Tom Fiddler	Shane Kelly
Clive Mackay	James Mihell	Peter Wong

#### Examinations

Christopher Jones for Province of British Columbia	5778
Murray Minchin for Douglas Channel Watch	6138
Chris Peter for C.J. Peter Associates Engineering	6726

## Examination by Christopher Jones for Province of British Columbia 5778

### Leak detection threshold

Mr. Jones introduced himself and stated that he would be asking questions with respect to leak detection design. The discussion which followed was detailed and technical. Readers

with an interest in the issue should follow it in the transcript. Only a few key points are noted in this summary.

Mr. Jones asked when the minimum leak detection size will be known. Mr. Callele replied that the CPM (computational pipeline monitoring) has a minimum threshold detection of 1.5 to 3 percent of nominal flow. He added that this is not a theoretical sensitivity, but they will be able to say with more confidence as design and eventually construction progresses. They cannot measure it, because they don't have the system in place to test it on.

### **Two leak detection redundancy methods at pump stations**

Mr. Callele described two redundancy methods of leak detection at pump stations. One is to enclose the station, and install gas level alarms; the other is to create a sump at the station, and install high sump level alarms. NGP will have enclosures at all pump stations. 5822

### **Leak sensitivity in comparable pipelines**

Mr. Callele stated that comparison is difficult and levels vary based on vintage and instrumentation. NGP will have ultrasonic flow meters at a certain intervals, combined with the CT (custody transfer) meters, combined with PTs (pressure transmitters) around every valve. "We will have one of the best instrumented pipeline systems not only in North America, but probably the world," said Mr. Callele. 5831

He said they had compared Northern Gateway to Keystone and Keystone XL and "we feel that industry is capable of achieving that 1 to 2 percent" in a 2 hour alarm window. 5842

Mr. Jones estimated that a spill of 3 percent for two hours in NGP would spill about 208,000 litres (or 208 m<sup>3</sup> or 1308 barrels) of oil. 5857

### **Alternate methods of leak detection**

In one IR response (3.12F.4 in [Exhibit B44-2](#)), NGP stated that alternate leak detection methods could be used when there is a loss of data. These include foot patrols, aerials patrols, pressure monitoring, tank gauging at the inlet and at the outlet. 5879

### **Effectiveness of leak detection systems**

Mr. Jones cited two items from a recent Bloomberg news article that only 5% of all spills, and only 20% of larger spills, are detected by leak detection systems. Mr. Callele said they had reviewed these reported figures and believe the 5% should be 15.7% and the 20% should be 32%. 5889

Mr. Jones said that the Province of BC reviewed the same PHMS data and looked at Enbridge spills from 2002 to the present. Their findings: only 3 of 31 Enbridge spills, and none of the six largest spills, were found by leak detection systems. 5900

Mr. Callele's reply was lengthy, informative, and defensive. It begins at paragraph 5906

## **Michigan, SCADA and human and systemic errors**

Mr. Callele stated that both the SCADA (supervisory control and data acquisition) and the leak detection system reported the Michigan release in under five minutes.

“Unfortunately, human error occurred, systemic problems ...” 5921

Another lengthy discussion touched on various subjects, including acoustic frequency detection methods. With reference to IR11.4 in [Exhibit B101-2](#), which discusses a number of leak detection systems that were being considered by Northern Gateway, Mr. Jones had a number of questions. Mr. Callele’s replies include a description of how Enbridge evaluates and tests technologies. This section begins at 6001.

## **Thirteen minutes to shut down**

Under Enbridge policy the maximum time to shut down is thirteen minutes. If at ten minutes there is still uncertainty as to what is causing a release, shutdown or isolation is to be commenced. It then takes three minutes for a valve or valves to close. 6073

Mr. Callele said, “When somebody phones in, saying they smell something, that causes an immediate shut down of our pipeline system. There’s no if ands or buts on that.” 6089

## **Examination by Murray Minchin for Douglas Channel Watch 6138**

### **Hearing shut down briefly**

Mr. Minchin was unable to begin his questioning because of interruptions from the audience. The Chairperson shut the hearing down for ten minutes or so, then resumed.

### **Spill return periods**

Using “spill return periods” as a metric for risk of an area, Mr. Minchin observed that the 166 km west from Bruderheim has a spill return period of 669 years, and that the 105 km through the Coast Mtns has a spill return period of 1058 years. Mr. Minchin asked how the Coast Mtns could be twice as safe as the flatlands of Alberta. 6201

Mr. Cavers and Mr. Mihell replied about the geohazards posed by Alberta’s deep river valleys and spoke of “early estimates” and “based on Route R rather than Route U.” 6211

His questions ranged over spill volumes, detection sensitivities, and the apparent reliance NGP is placing on third parties phoning in a spill report in a region “infrequently visited by people,” and with no phone services. 6231

### **Faults, seismicity, earthflows**

Mr. Cavers discounted Mr. Minchin’s concerns about seismicity on the pipeline route. A lengthy discussion on the subject begins at 6262

Mr. Minchin asked if they could predict earthflows and how large they will be. Mr. Cavers said, “Yes”, and both he and Mr. Kelly explained, with respect to glaciomarine clay and the studies NGP is continuing with. 6336

Mr. Minchin asked if they will build the project without knowing what the seismic risks are. The answer is that they will, if the Panel approves it. Later, Mr Cavers said it's not correct to think there's a boogeyman in every closet. 6373, 6411

### **My boogeyman: 700 million litres of oil**

Mr. Minchin explained his concern with them building the project without a complete understanding of the seismic risks: "My boogeyman is 744,100,000 litres of diluted bitumen spilling a couple hundred metres down the slope straight into the Douglas Channel" from the tank farm. 6428

### **Tanks**

The tank farm will consist of 14 identical tanks of 78,000 cubic metres each. They will be constructed on bedrock. Containment capacity will be 2.3 times the volume of a single tank. 6440

### **Northern Gateway and Pacific Trails**

Concerning Pacific Trail's pipeline and specifically the Houlton Creek Valley, Mr. Minchin quoted from [Exhibit B83-7](#) in which NGP said: "From the point of view of best use of the terrain and the least overall construction cost, it would be preferable for all pipeline proponents to cooperate, thus reducing both construction costs and maintenance costs. This would also reduce the overall width of the disturbed zone in some areas and would optimize use of the terrain." 6482

It appears that Pacific Trail Pipelines and Northern Gateway have not attempted to cooperate. Mr. Cavers says, "We believe PTP have already cleared their right-of-way," but NGP does not know where that is. Nor does he know "who may be in there first" to build a pipeline. Nor at this point does Mr. Cavers know where NGP will route through the valley, relative to the PTP.

Mr. Minchin established that NGP intended to build the west portal of Houlton Tunnel and an aerial crossing of Houlton Creek at a location where the forest could be swept clear by avalanches. Mr. MacKay said that factor will be taken into account in the design. 6568

He expressed concern about the evidence of fractured rock at Hunter Creek and the challenges that could present to NGP's plans to horizontally drill for the pipelines under the stream. Since NGP recognizes the increased potential for debris flows due to logging, "does that mean that the company will accept full liability for ruptures caused by debris slides?" Mr. Minchin asked. He didn't receive an answer, but was referred back to the Edmonton transcripts by the Chairperson. 6619

### **Self-audits and Michigan**

Mr. Minchin quoted from the Application ([B1-5](#)) that NGP intends to perform internal audits to document compliance of its own people and contractors. He then asked if it was correct that Enbridge had been fined close to \$1 million for contractors who were found

responsible for 500 permit violations and 115 non-compliances. Mr. Fiddler acknowledged that was the case. 6658

### **Pitting corrosion**

Mr. Minchin quoted from a report by Alberta Innovates which stated that, “pitting corrosion has been observed under ... sludge deposits.” He asked whether a similar thing might happen with NGP, especially if the the pipeline needs to shut down when it is full. The scenario he presents is the tankers aren’t moving, and the tanks at the Kitimat terminal are full. Mr. Mihell replied that NGP will operate with 0.5% moisture levels versus the 10% moisture levels in the report, and in Enbridge’s experience with Line 4, a comparable pipeline, pitting has not been an issue. 6665

### **Examination by Chris Peter for C.J. Peter Associates Engineering 6726**

Mr. Peter confirmed that sediment and water content in the products shipped on NGP must not exceed 0.5% by volume. He also cites NGP that flow velocities lower than 1.2 metres per second are associated with the accelerated deposits of solid particles, and with over-bends in a pipeline. His initial questions are focussed on sediments and their behaviour in the pipeline, when shut down and at various flow rates.

### **Line pipe**

Mr. Peter referred to a number of documents filed in evidence by NGP which include pipe specifications. One of the documents ([Exhibit B64-9](#)), a reply to the JRP, has been redacted in its public version. Mr. Peter asked. “Surely this action ... is hiding information from the public and is contrary to the purpose of these hearings, is it not?” 6865

Ms. Estep objected on behalf of NGP, the Chairperson noted that it is just about 4:30 and so finished up for the day. In the morning, the Panel will provide a ruling and direction on this matter.

### **Northwest Institute request denied**

On October 5, NGP had filed 118 terrain stability maps. Pat Moss of the Northwest Institute for Bioregional Research had requested at least two weeks to review these detailed maps before questioning on them. In its ruling today, the Panel denied the request, but did allow the NIBR to be the last intervenor questioning Panel #1. 6329