

**From:** [Macdonald, Gord \(DDMI\)](mailto:Gord.Macdonald@riotinto.com)  
**To:** [Patty Ewaschuk](mailto:pewaschuk@wlb.ca)  
**Cc:** [Sarah Elsasser](mailto:selsasser@wlb.ca); [Wells, David \(DDMI\)](mailto:David.Wells@riotinto.com)  
**Subject:** RE: Spillway modification  
**Date:** March-16-17 2:48:02 PM

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**From:** Patty Ewaschuk [<mailto:pewaschuk@wlb.ca>]  
**Sent:** Thursday, March 16, 2017 12:40 PM  
**To:** Macdonald, Gord (DDMI)  
**Cc:** Sarah Elsasser; Wells, David (DDMI)  
**Subject:** RE: Spillway modification

Ok thanks. So the total freeboard of 0.4 m is 0.2 m for wind/wave and 0.2 m for the IDF volume. Your proposal is that DDMI would at all times maintain 0.2 m freeboard for wind/waves, but could use some or all of the 0.2 m that is necessary to ~~pass hold~~ the IDF volume at DDMI's discretion. Let me know if I've got that wrong.

Patty

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**From:** Macdonald, Gord (DDMI) [<mailto:Gord.Macdonald@riotinto.com>]  
**Sent:** March-16-17 12:43 PM  
**To:** Patty Ewaschuk <[pewaschuk@wlb.ca](mailto:pewaschuk@wlb.ca)>  
**Cc:** Sarah Elsasser <[selsasser@wlb.ca](mailto:selsasser@wlb.ca)>; Wells, David (DDMI) <[David.Wells@riotinto.com](mailto:David.Wells@riotinto.com)>  
**Subject:** RE: Spillway modification

Patty,

We have not identified the specific circumstances under which water might flow through the spillway to Pond 3. As water would remain within containment we would expect that when water is flowing through the spillway to Pond 3 it would be viewed as a "compliant" or "permitted" activity provided the water depth within the spillway does not exceed 0.2m. DDMI does not plan to use the spillway as a normal operating procedure to move water from the PKC to Pond 3, it would only be by exception and if/when this occurred actions would be taken immediately to lower the PKC water levels to eliminate the flow through the spillway. We can certainly describe our immediate operating plans for PKC water levels in the next Operations Plan update following approval of the spillway modification. If it would be helpful we could include in that Plan the likelihood of water flowing through the spillway to Pond 3 for the proposed operating plan. We expect operating plans for PKC water level may change over the remainder of the operating life of the facility and that these changes would be submitted for WLWB review and approval.

We have no concerns if you remove the second sentence as suggested.

Gord

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**From:** Patty Ewaschuk [<mailto:pewaschuk@wlb.ca>]  
**Sent:** Thursday, March 16, 2017 9:40 AM  
**To:** Macdonald, Gord (DDMI)  
**Cc:** Sarah Elsasser; Wells, David (DDMI)

**Subject:** RE: Spillway modification

Hi Gord – sorry for the delay; I have been out of the office.

The information you provided is already depicted in Figure 2 of the original modification request, which shows that DDMI's NOWL, spillway invert, and 0.4 m freeboard are all at the same elevation, and that a min freeboard of 0.2 m is required for wind/waves. Thus the second sentence does not add any new information, but re-states what is already known.

To address this, are you able to identify the circumstances (if any) under which DDMI should be permitted to allow water to flow over the spillway? In other words, if the 0.4 meters does not have to be maintained at all times (i.e., water can be spilled sometimes), under what circumstances should DDMI be permitted to spill water?

Patty

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**From:** Macdonald, Gord (DDMI) [<mailto:Gord.Macdonald@riotinto.com>]

**Sent:** March-09-17 5:33 PM

**To:** Patty Ewaschuk <[pewaschuk@wlb.ca](mailto:pewaschuk@wlb.ca)>

**Cc:** Sarah Elsasser <[selsasser@wlb.ca](mailto:selsasser@wlb.ca)>; Wells, David (DDMI) <[David.Wells@riotinto.com](mailto:David.Wells@riotinto.com)>

**Subject:** RE: Spillway modification

Patty,

Does the following work:

A minimum Freeboard limit of 0.2 metres from the water level to the lowest surveyed point of the dam crest liner shall be maintained at all times. A Freeboard of less than 0.4 metres can occur when water is flowing through the spillway to Pond 3.

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**From:** Patty Ewaschuk [<mailto:pewaschuk@wlb.ca>]

**Sent:** Thursday, March 09, 2017 1:13 PM

**To:** Macdonald, Gord (DDMI)

**Cc:** Sarah Elsasser; Wells, David (DDMI)

**Subject:** RE: Spillway modification

Ok thanks.

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**From:** Macdonald, Gord (DDMI) [<mailto:Gord.Macdonald@riotinto.com>]

**Sent:** March-09-17 2:53 PM

**To:** Patty Ewaschuk <[pewaschuk@wlb.ca](mailto:pewaschuk@wlb.ca)>

**Cc:** Wells, David (DDMI) <[David.Wells@riotinto.com](mailto:David.Wells@riotinto.com)>; Sarah Elsasser <[selsasser@wlb.ca](mailto:selsasser@wlb.ca)>

**Subject:** RE: Spillway modification

Patty,

Sort of. We are looking at both #1 as you note below but also #2.

But yes it is with DDMI to get back to you and we do understand that you may need to wait for SRK.

Gord

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**From:** Patty Ewaschuk [<mailto:pewaschuk@wlwb.ca>]  
**Sent:** Thursday, March 09, 2017 12:44 PM  
**To:** Macdonald, Gord (DDMI)  
**Cc:** Wells, David (DDMI); Sarah Elsasser  
**Subject:** RE: Spillway modification

Hi Gord – just to be sure we are on the same page, the outcome of our conversation is that DDMI will look into the possibility of improving Option #1 by identifying the circumstances (if any) under which DDMI proposes NOT to meet the 0.4 m freeboard. We may also need to wait until I can touch base with SRK at the end of the month.

Patty

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**From:** Patty Ewaschuk  
**Sent:** March-09-17 12:56 PM  
**To:** Macdonald, Gord (DDMI) <[Gord.Macdonald@riotinto.com](mailto:Gord.Macdonald@riotinto.com)>  
**Cc:** Sarah Elsasser <[selsasser@wlwb.ca](mailto:selsasser@wlwb.ca)>; 'Wells, David (DDMI)' <[David.Wells@riotinto.com](mailto:David.Wells@riotinto.com)>  
**Subject:** RE: Spillway modification

Hi Gord, we may want some input from SRK on what you've proposed, but the SRK lead for this work is unavailable until the end of the month. It's up to you whether you want to wait until I get a chance to talk to SRK or go ahead with a call now. If you want to go ahead, I am free until 2 pm MT today, and then I am off Friday to Wednesday.

In the meantime, given DDMI's objection to including "at all times" in Option #1, if Option #1 were approved, are there certain conditions when you think the 0.4 m restriction wouldn't apply?

Patty

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**From:** Patty Ewaschuk  
**Sent:** March-09-17 9:45 AM  
**To:** 'Macdonald, Gord (DDMI)' <[Gord.Macdonald@riotinto.com](mailto:Gord.Macdonald@riotinto.com)>  
**Cc:** Sarah Elsasser <[selsasser@wlwb.ca](mailto:selsasser@wlwb.ca)>; Wells, David (DDMI) <[David.Wells@riotinto.com](mailto:David.Wells@riotinto.com)>  
**Subject:** RE: Spillway modification

As always we will bring all the info to the Board and they will make a decision, but I believe that is the way this kind of condition has been handled in the past.

Patty

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**From:** Macdonald, Gord (DDMI) [<mailto:Gord.Macdonald@riotinto.com>]  
**Sent:** March-09-17 9:39 AM  
**To:** Patty Ewaschuk <[pewaschuk@wlwb.ca](mailto:pewaschuk@wlwb.ca)>

**Cc:** Sarah Elsasser <[selsasser@wlwb.ca](mailto:selsasser@wlwb.ca)>; Wells, David (DDMI) <[David.Wells@riotinto.com](mailto:David.Wells@riotinto.com)>  
**Subject:** Re: Spillway modification

So you won't actually be changing the language in the license.

On Mar 9, 2017, at 7:32 AM, Patty Ewaschuk <[pewaschuk@wlwb.ca](mailto:pewaschuk@wlwb.ca)> wrote:

Gord – thanks for this. I will get back to you about when would be a good time.

For clarity – the Board doesn't need to amend the condition, because the condition allows the Board to approve something other than the 1.5 m freeboard. The wording is important so the Board can be clear about what it is approving.

Patty

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**From:** Macdonald, Gord (DDMI) [<mailto:Gord.Macdonald@riotinto.com>]  
**Sent:** March-08-17 7:22 PM  
**To:** Patty Ewaschuk <[pewaschuk@wlwb.ca](mailto:pewaschuk@wlwb.ca)>  
**Cc:** Sarah Elsasser <[selsasser@wlwb.ca](mailto:selsasser@wlwb.ca)>; Wells, David (DDMI) <[David.Wells@riotinto.com](mailto:David.Wells@riotinto.com)>  
**Subject:** RE: Spillway modification

Patty,

I have discussed this with the Engineer of Record and it would be easiest to discuss by phone.

Is there a time tomorrow I could call?

For you to think about before/during the call.

I don't think we agree with what you have suggested. We think it needs to be either:

1. a minimum Freeboard limit of 0.4 metres from the normal operating water level to the lowest surveyed point of the dam crest liner; or
2. a minimum Freeboard limit of 0.2 metres from the ~~normal operating~~ water level to the lowest surveyed point of the dam crest liner **shall be maintained at all times**

Both of the above matches the design and recommendation of Engineer of Record but simply adding "shall be maintained at all time" to #1 is not. we suggest #1 is more appropriate to include as a license condition as it relates to the condition most likely to be observed ("normal operating water level") and the condition that DDMI can actively manage to. This value ("normal operating water level") is what we manage. We manage water to stay below 464.6 m which is 0.4 m below the dam crest liner. In #2 "At all times" i.e. even during the design event the water level could be 0.2m deep in the spillway (while flowing to Pond 3) and still be 0.2m below the dam crest liner to prevent wind/wave causing overtopping the dam for the design event. While #2 is correct it doesn't seem practical to be specifying a compliance condition that would only occur during a design event as it would be unlikely to ever observe this.

We thought about other ways to say the same thing – for example specifying the normal water level to remain below 464.6 m but then what happens if/when we have another raise? Do we have to amend the License to change the value?

This also brought up the point that the condition should still include ... *“or as recommended by a Geotechnical Engineer and as approved by the Board;”* as it is possible the limit may change with a future dam raise.

Also – is it even possible to change Part H Item 21a) as we have been talking about without amending the License? It is a condition in the body of the license so isn't that an amendment requiring Minister approval?. Which brings me back to leaving the clause as it is.

Could the specifics about how we manage the normal operating water level to respect the freeboard be described in the PKC Operations Plan instead? Trying to be helpful.

Gord

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**From:** Patty Ewaschuk [<mailto:pewaschuk@wlb.ca>]  
**Sent:** Tuesday, March 07, 2017 9:50 AM  
**To:** Macdonald, Gord (DDMI)  
**Cc:** Sarah Elsasser; Wells, David (DDMI)  
**Subject:** RE: Spillway modification

Hi Gord,

I am following up on our recent discussion in regards to my email below about DDMI's response to Lands Comment #1 on the ORS. At that time you mentioned the possibility of Board approval of the freeboard limit by reference to the freeboard limits in the modification. This could still leave uncertainty about when the minimum freeboard of 0.4 m freeboard applies.

DDMI has proposed that the minimum freeboard does not need to apply “at all times” as it currently does. In the current set up, the words “at all times” ensure that even if the EDF (1 in 500 year event) occurs, there is still room for the IDF (including IDF volume and wind and wave run-up). Numerically, this meant that above the NOWL, there was room for the IDF and EDF, i.e., 0.7 m for EDF + 0.2 m for IDF volume + 1.4 m for wind and wave run-up, per the Phase 6 design (March 12, 2013). In other words, there would be 1.6 m of freeboard (slightly more than the licence requires) at all times. The original PKC design (2001) worked in a similar way, but with even more freeboard.

Given that DDMI proposes no room is needed to hold the EDF if its passed to Pond 3, it seems then that the corollary to the current Licence language would be that a minimum freeboard of 0.4 m (0.2 m for IDF volume and 0.2 m for wind/waves) would need to be maintained at all times. In any situation where some of the 0.4 m is used up (i.e., water rises above the invert elevation) there will not be enough freeboard for an

IDF (volume and wind/waves). Does DDMI agree then that the words “at all times” are necessary, and if not please provide a rationale.

Thanks,  
Patty Ewaschuk, P. Eng  
Technical Advisor  
Wek’èezhìi Land and Water Board  
416-432-6066

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**From:** Patty Ewaschuk  
**Sent:** February-22-17 12:32 PM  
**To:** [David.Wells@riotinto.com](mailto:David.Wells@riotinto.com)  
**Cc:** Sarah Elsasser <[selsasser@wlb.ca](mailto:selsasser@wlb.ca)>  
**Subject:** Spillway modification

Hi Dave, a couple of clarifications about the spillway mod and freeboard limit request:

1. In his review of DDMI’s spillway mod and freeboard limit request, the Inspector (comment #1) raised concerns that DDMI’s proposed freeboard limit wording would make it difficult to determine compliance. In response, DDMI said that:  
“..the DDMI proposed wording is more specific than the existing wording as it specifies where the lowest survey point is (i.e. the dam crest liner) rather than the existing wording that provides an option (i.e. the liner or the engineered emergency spillway, whichever is lower). DDMI's proposed wording also more specifically includes reference to the "normal operating water level" rather than the existing wording of "at all times". The existing wording of "at all times" does not differentiate between normal operating water levels and water levels that would occur during a rainfall/flood event. By design, a freeboard limit is not intended to apply during an event.”

I don’t believe that DDMI’s statement that “by design, a freeboard limit is not intended to apply during an event” is correct. It appears the original 1.5 m freeboard was meant to apply during the event, as described in the original 2001 design: “The emergency spillway shall be of sufficient width to pass the peak flow while maintaining a free board of 1.5 m.” (page 104) and “The PMP design event will raise the water level approximately 0.4 m, leaving approximately 1.6 m freeboard.” (page 109).

So in that situation, the Inspector can confirm compliance even during an event. However, DDMI’s newly proposed wording does not allow the Inspector to determine compliance during an event. Please confirm that my understanding is correct and provide any further response to the Inspector’s concerns about confirming compliance.

2. The inspector also raised concerns that it will be difficult to determine where the normal operating level is. However, as I understand it, the 0.4 m freeboard applies when the normal operating level is at Elevation 464.6 m (i.e., the spillway invert) which should be straightforward for the Inspector to confirm. Please confirm my understanding is correct.

Ideally, we would like to hear from you on these issues today.

Thanks,  
Patty