Diana Clendon

To: Diana Clendon
Subject: FW: No 8 application
Attachments: 20190521 - DoC Clarifications rev 1.pdf

From: James Gardner-Hopkins <james@jghbarrister.com>
Sent: Wednesday, 22 May 2019 2:44 p.m.
To: Diana Clendon <dclendon@doc.govt.nz>
Cc: Jeremy Kent-Johnston <jeremykj@gmail.com>; Tom Drinan <tdrinan@doc.govt.nz>
Subject: Re: No 8 application

Hi Di,

Please find **attached** a response from No 8, which hopefully clarifies the questions that have arisen.

No 8 is happy to clarify any further matters that might arise, to assist in the process - but is hopeful that the information provided is sufficient for DOC to make a positive decision in respect of the application / process. While there were some earlier information gaps that I understand DOC considered problematic, I do not understand there to be any fundamental information issues any more. Please let me know if that is the case.

Kind regards
James

JAMES GARDNER-HOPKINS | BARRISTER

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On 14/05/2019, at 1:20 PM, Diana Clendon <dclendon@doc.govt.nz> wrote:

Hi James

Following our meeting on Monday, I can confirm that we now have all the substantive information that we require. We will now complete our consideration of the effects and then I will prepare a draft decision report.

Timeline
Allowing time for specialist input, time for me to draft the decision report and have it reviewed, at a guestimate, it is likely to come to you for comment the week of 24 June.

Clarifications
However there may be a few remaining clarifications required as I write up the detail of the decision report. Also our freshwater specialist would like to clarify flows with your freshwater consultant as

there is still some remaining discrepancies with exactly what is proposed to be extracted. Are you happy for him to contact him directly? The following clarifications sought are:

- Please clarify how much flow is intended to be left in the creek immediately below the intake site during operation – is it 252 (75% of MALF) or 312 L/s (75% of MALF + min flow needed to operate the turbine [60 L/s]). There still are some discrepancies:
    - *"The gradual abstraction of up to 600L/s from the impacted reach will result in a significant shift in flow dynamics* ***with the majority of flows leaving the abstraction site at 252L/s***" (p 37 of ENZ report). Whereas, the 'No 8 Limited – Response to DOC further information request' states that *"Only when flows increase in the river and the water level rises, does water flow over the Coanda weir, and is utilised by the project at flows between 60 l/s and 600 l/s.* ***Up to a flow of 312 l/s, all water is released downstream***".
    - Following on from this point, I am correct in assuming that all flows between the ranges 312 to 912 L/s will be abstracted by the scheme during operation (i.e., the creek will be flatlined for a considerable period at 312 L/s immediately below the intake during scheme operation). Is there a flow duration curve plot available for the intake site showing current and operating flow regimes (similar to Fig 31 of EIA)?

- Is there any further hydrological information available for the site (that has been collected since NIWA's July 2018 report).

- Finally, could you please clarify where the waterfall (plate 8) in ENZ's August 2018 report is located. Is this the natural barrier that was trapped/netted above (referred to in s 5.2 of ENZZ's April 2019 report).

Regards

Di Clendon - Kaihoho takawaenga a tuku
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No. 8 Limited
26 Crummer Rd,
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Auckland 1021

21 May 2019

RE: CONCESSION APPLICATION — McCulloughs Creek Hydropower Scheme

Dear Diana,

This letter answers questions in email dated 14 May 2019. No.8 Limited's responses in blue, italic.

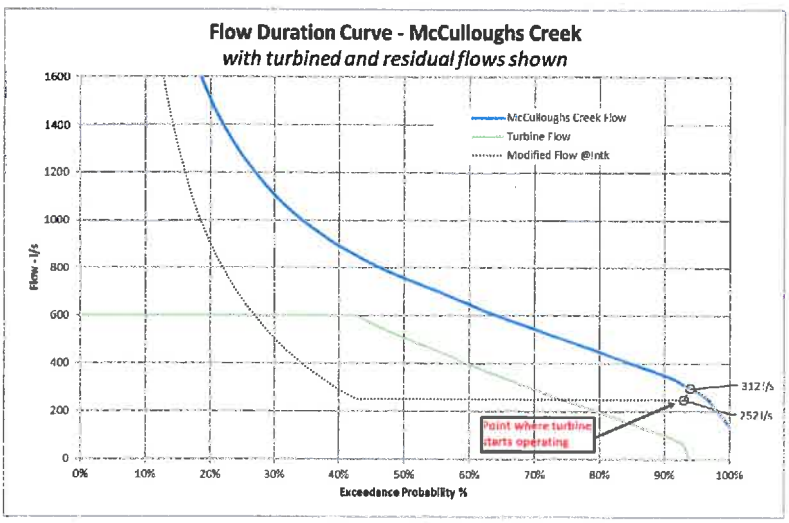
- Please clarify how much flow is intended to be left in the creek immediately below the intake site during operation – is it 252 (75% of MALF) or 312 L/s (75% of MALF + min flow needed to operate the turbine [60 L/s]). There still are some discrepancies: *"The gradual abstraction of up to 600L/s from the impacted reach will result in a significant shift in flow dynamics <u>with the majority of flows leaving the abstraction site at 252L/s</u>"* (p 37 of ENZ report). Whereas, the 'No 8 Limited – Response to DOC further information request' states that *"Only when flows increase in the river and the water level rises, does water flow over the Coanda weir, and is utilised by the project at flows between 60 l/s and 600 l/s. <u>Up to a flow of 312 l/s, all water is released downstream</u>"*.

The minimum flow in the river, immediately below the intake has been set to 252 l/s, consistent with the reporting. The minimum flow that the turbine can utilise is 60 l/s. Therefore, the flow at the intake needs to be 312 l/s before flow can be diverted. At flows just less than 312 l/s, no water is used by the turbine, so all is released downstream. However, when the turbine does begin to operate, the minimum flow released downstream is always 252 l/s or greater.

For example, at 315 l/s, 252 l/s is left in the stream (below intake) and 63 l/s would enter the hydro power pipeline. Similarly, at 552 l/s at the intake, 252 l/s flows over intake, turbine takes 300 l/s.

As the creek travels downstream, flows increase as natural tributaries join the river. 252 l/s at the intake is approx. 430 l/s near the powerhouse.

A flow duration curve showing pre and post extraction flow below, with comment on where the turbine operation starts:

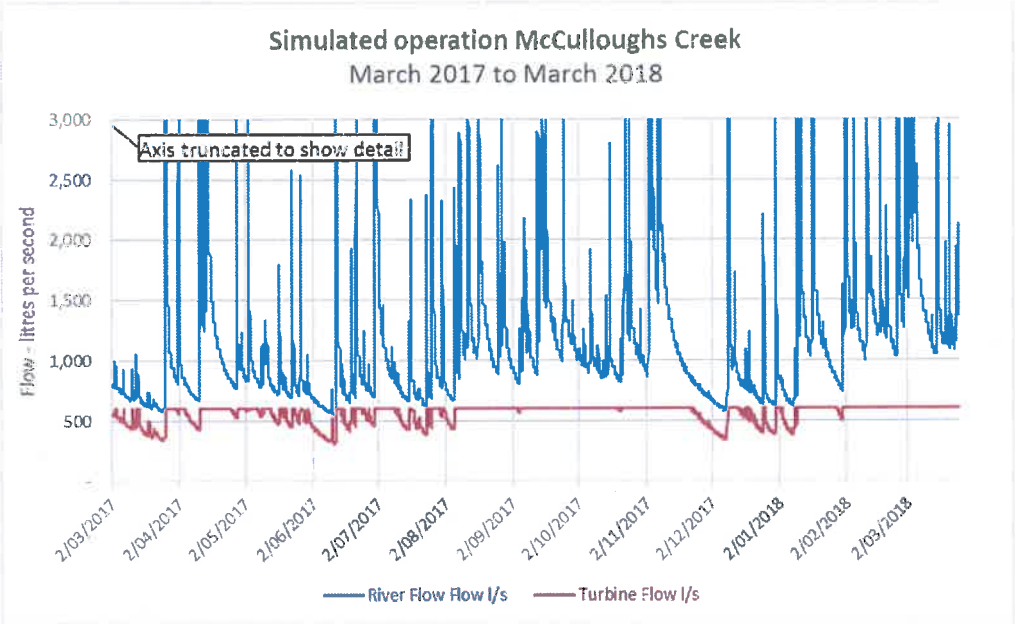


- Following on from this point, I am correct in assuming that all flows between the ranges 312 to 912 L/s will be abstracted by the scheme during operation (i.e., the creek will be flatlined for a considerable period at 312 L/s immediately below the intake during scheme operation). Is there a flow duration curve plot available for the intake site showing current and operating flow regimes (similar to Fig 31 of EIA)?

Flows will be abstracted when the river has flows larger than 312 l/s (at intake), but there is no upper limit. For example, the project may still operate if flows are 5,000 l/s. In this example, the turbine would use 600 l/s, with 4,400 l/s flowing over the intake.

The flows do not flatline - the duration curve shows an exceedance on the x-axis, not time so is <u>not</u> chronological. The following figure shows the operation using the same data as shown in the flow duration curve above, from March 2017 to March 2018.

The figure shows the river flows and the turbine flows in chronological order (time on x-axis). From the image, the frequency of floods and high flow events can be seen, alternating with occasional low flow events between storms.



- Is there any further hydrological information available for the site (that has been collected since NIWA's July 2018 report).

Yes, however, the gauge site was damaged by a slip around 19 March 2019. NIWA believes the gauge to be recoverable, at which point the data should be available. In any event NIWA is looking to re-install the gauge asap.

- Finally, could you please clarify where the waterfall (plate 8) in ENZ's August 2018 report is located. Is this the natural barrier that was trapped/netted above (referred to in s 5.2 of ENZZ's April 2019 report).

The photo in plate 8 is located at Lat: -43.264091, Long: 170.428664. This image is an example of the many natural barriers in that reach, however I don't believe the specific one described in Ecology NZ text. Another example from approximately 100 m away from image in Plate 8 is below.

The reach in question features many large barriers, over 2 m in height, with several much larger drops (+5 m) at Lat: -43.264371, Long: 170.432127 (near the Alpine Fault).

A map of these locations is shown below, with Plate 8 location labelled:

Yours sincerely,

Jeremy Kent-Johnston, BE (Civil), CPeng, MIPENZ