Bennett, Timothy A ENV:EX

From: Marc Nering [mnering@capitalpower.com]
Sent: Monday, March 28, 2011 3:37 PM
To: 'Busto, Vince'; 'Knight, Francesca'; Bennett, Timothy A ENV:EX
Cc: Jena Tufts; Elyse MacDonald
Subject: Signed Ramping Procedure Document
Attachments: MA01M20220110328110015.pdf

Hello all,

Please see the new Mamquam ramping procedure attachment for rough zone avoidance. This was implemented immediately after the March 21 ramping incident. As discussed, we are also installing 3 level transducers below the intake to measure spill, and 3 below the powerhouse to measure total river flow. These transducers will be hardwired into the plant PLC's, so rough zone avoidance can be an automated process instead of a manual process. This will ensure the plant will not ramp up through the rough zone unless there is enough water flow to support operation above the rough zone. We expect to have the process automated by early June, as there is an 8 week delivery on the specialty cabling, and there will be some time allotted for programming and testing.

In addition, I have discussed this procedure with Ecofish (our environmental monitors), and will send them a copy for their comments.

Regards,

Marc

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:35 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam Corrective Action Plan
Attachments: Mamquam Corrective Action Response Letter 8-Apr-2011.pdf

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582 5235

From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: Monday, April 11, 2011 2:13 PM
To: 'Busto, Vince'; 'Knight, Francesca'
Cc: Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; Bennett, Timothy A FLNR:EX; Babakaiff, Scott C FLNR:EX; Stoddard, Erin M FLNR:EX; 'Adam Lewis'
Subject: Mamquam Corrective Action Plan

Good Afternoon Vince and Francesca.

Thank you for meeting us at the Mamquam generating station on Wednesday April 6. Please find attached a letter describing the corrective actions and associated target dates that CPC will be implementing to address our concerns regarding ramping and fish stranding.

I will be providing a bi-weekly update on the progress and challenges that we may experience during the implementation of these corrective actions.

Please do not hesitate to contact me if you have any questions or concerns.

Best Regards,
Jena

Jena Tufts, M.Sc., E.I.T.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5522 | jtufts@capitalpower.com

Please consider the environment before printing this e-mail

Capital Power Corporation
8th Floor, 10065 Jasper Avenue
Edmonton, AB T5J 3B1
www.capitalpower.com

Capital Power Corporation

April 8, 2011

Mr. Vince Busto
Fisheries and Oceans Canada
Unit #3 – 100 Annacis Parkway
Delta, BC V3M 6A2

Ms. Francesca Knight
Fisheries and Oceans Canada
Unit #3 – 100 Annacis Parkway
Delta, BC V3M 6A2

Dear Mr. Busto and Ms. Knight:

RE: **Ramping Rate Concerns, Lower Mamquam IPP, Squamish**

Thank you for meeting with us at our Mamquam generating station on Wednesday, April 6, 2011. I would like to emphasize that CPC is taking the incident that occurred on March 21, 2011 very seriously. CPC has completed an internal investigation of the incident and have determined the following corrective actions and associated target dates necessary to address our concerns regarding ramping and fish stranding.

	Corrective Action	Task Owner	Target Date
1	Update manual control procedure to prevent future re-occurrence of plant ramping up through rough zone, flows not able to sustain increased generation and then ramping down through rough zone.	Marc Nering	Completed
2	CPC to provide Fisheries and Oceans and the B.C. Ministry of Environment the corrective action schedule that was developed to mitigate ramping and fish stranding concerns.	Michael Smith	Completed
3	CPC to confirm viability of reducing the rough zone ramping range from 9-16 MW to 9-15 MW.	Marc Nering	Completed
4	CPC to provide a professional biologist's opinion regarding monitoring in the diversion reach.	Jena Tufts	15-Apr-11
5	A new runner on Unit 2 turbine is currently being installed. This new runner will reduce the rough zone avoidance range that is currently causing high vibrations that are detrimental to the turbine.	Marc Nering	1-May-11
6	Vibration testing of new runner to determine new rough zone avoidance range.	Marc Nering	31-May-11
7	During commissioning of unit 2, determine and provide the relationship between rough zone ramping and flow monitoring.	Marc Nering	15-Jun-11
8	Six new flow/level sensors, 3 below intake to measure spill and 3 below the powerhouse to measure total river flow, will be installed.	Marc Nering	1-Jun-11
9	Cable will be installed to directly connect the river flow gauges to the PLC programming.	Marc Nering	15-Jun-11

Corrective Action (cont'd)		Task Owner	Target Date
10	PLC programming will be updated to include the live data from the river level gauges.	Marc Nering	30-Jun-11
11	CPC to notify Fisheries and Oceans and the Ministry of Environment of any subsequent rough zone ramping events that occur until the corrective actions have been fully implemented.	Marc Nering	As Required
12	CPC to provide bi-weekly updates on the progress and challenges occurring at Mamquam.	Jena Tufts	Ongoing

As discussed in the April 6, 2011 site visit, CPC will provide bi-weekly updates on the progress of implementing these corrective actions as well as any challenges that we are experiencing that may affect the current target dates.

I look forward to working with you to mitigate the concerns regarding ramping and fish stranding at the Mamquam generating facility. Please don't hesitate to contact me (780-392-5169) or Jena Tufts (780-392-5522) if you have further questions.

Sincerely,

Michael J. Smith
Senior Manager, Environmental Programs & Compliance
Capital Power

cc: Tim Bennett – Ministry of Environment
Scott Babakaiff – Ministry of Environment
Erin Stoddard – Ministry of Environment
Adam Lewis – Ecofish Research Ltd.
Marc Nering – Capital Power
Rudy Barrett – Capital Power
Rob Brassard – Capital Power
Jena Tufts – Capital Power

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:35 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam Corrective Action Plan

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Knight, Francesca [mailto:Francesca.Knight@dfo-mpo.gc.ca]
Sent: Monday, April 11, 2011 2:47 PM
To: Jena Tufts; Busto, Vince
Cc: Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; Bennett, Timothy A FLNR:EX; Babakaiff, Scott C FLNR:EX; Stoddard, Erin M FLNR:EX; Adam Lewis
Subject: RE: Mamquam Corrective Action Plan

Hi Jena. thanks for sending this letter describing corrective actions for the rough zone ramping impacts/concerns at Lower Mamquam. Could you please provide more detail on tasks 6 and 7, specifically addressing the role of your environmental monitor in these steps to commission the new equipment. We'd be looking for something like a study plan for commissioning, which would include when and under what testing regimes Ecofish would be on site, and their role in advising Capital Power through the commissioning process.
regards,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
Oceans, Habitat and Enhancement Branch / Direction des océans, de l'habitat et de la mise valeur
Lower Fraser River - Le Bas Fraser
Unit 3 - 100 Annacis Parkway
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Francesca.Knight@dfo-mpo.gc.ca

Ph: (604) 666-3191 / Fax: (604) 666-6627
Squamish phone: 604-892-2040
Government of Canada - Gouvernement du Canada

From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: April 11, 2011 2:13 PM
To: Busto, Vince; Knight, Francesca
Cc: Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; 'Timothy.Bennett@gov.bc.ca'; 'Babakaiff, Scott';

'Stoddard, Erin '; 'Adam Lewis'
Subject: Mamquam Corrective Act... Plan

Good Afternoon Vince and Francesca,

Thank you for meeting us at the Mamquam generating station on Wednesday, April 6. Please find attached a letter describing the corrective actions and associated target dates that CPC will be implementing to address our concerns regarding ramping and fish stranding.

I will be providing a bi-weekly update on the progress and challenges that we may experience during the implementation of these corrective actions.

Please do not hesitate to contact me if you have any questions or concerns.

Best Regards.
Jena

Jena Tufts, M.Sc., E.I.T.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5522 | jtufts@capitalpower.com


Please consider the environment before printing this e-mail

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:35 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam Corrective Action Plan

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: Tuesday, April 12, 2011 11:29 AM
To: 'Knight, Francesca'; 'Busto, Vince'
Cc: Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; Bennett, Timothy A FLNR:EX; Babakaiff, Scott C FLNR:EX; Stoddard, Erin M FLNR:EX; 'Adam Lewis'
Subject: RE: Mamquam Corrective Action Plan

Hello Francesca,

I will work with Marc to create a commissioning procedure for the G2 startup. The role of the environmental monitor during commissioning will also be addressed. I will send this project plan along once completed.

Regards
Jena

Jena Tufts, M.Sc., E.I.T.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5522 | jtufts@capitalpower.com

From: Knight, Francesca [mailto:Francesca.Knight@dfo-mpo.gc.ca]
Sent: Monday, April 11, 2011 3:47 PM
To: Jena Tufts; Busto, Vince
Cc: Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; Timothy.Bennett@gov.bc.ca; Babakaiff, Scott; Stoddard, Erin ; Adam Lewis
Subject: RE: Mamquam Corrective Action Plan

Hi Jena, thanks for sending this letter describing corrective actions for the rough zone ramping impacts/concerns at Lower Mamquam. Could you please provide more detail on tasks 6 and 7, specifically addressing the role of your environmental monitor in these steps to commission the new equipment. We'd be looking for something like a study plan for commissioning, which would include when and under what testing regimes Ecofish would be on site, and their role in advising Capital Power through the commissioning process.

regards,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
Oceans, Habitat and Enhancement Branch / Direction des océans, de l'habitat et de la mise valeur
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Ph: (604) 666-3191 / Fax: (604) 666-6627
Squamish phone: 604-892-2040
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From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: April 11, 2011 2:13 PM
To: Busto, Vince; Knight, Francesca
Cc: Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; 'Timothy.Bennett@gov.bc.ca'; 'Babakaiff, Scott'; 'Stoddard, Erin '; 'Adam Lewis'
Subject: Mamquam Corrective Action Plan

Good Afternoon Vince and Francesca,

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I will be providing a bi-weekly update on the progress and challenges that we may experience during the implementation of these corrective actions.

Please do not hesitate to contact me if you have any questions or concerns.

Best Regards,
Jena

Jena Tufts, M.Sc., E.I.T.
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Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:35 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam Rough Zone Monitoring - Diversion Reach
Attachments: Ecofish - Mamquam Diversion Reach Rough Zone Monitoring Opinion.pdf

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Adam Lewis [mailto:fjalewis@ecofishresearch.com]
Sent: Friday, April 15, 2011 7:38 PM
To: 'Jena Tufts'; 'Knight, Francesca'; 'Busto, Vince'
Cc: 'Michael Smith'; 'Marc Nering'; Bennett, Timothy A FLNR:EX; Babakaiff, Scott C FLNR:EX; Stoddard, Erin M FLNR:EX; 'Elyse MacDonald'
Subject: RE: Mamquam Rough Zone Monitoring - Diversion Reach

Hello:

Further to a request made by DFO regarding the rationale for not monitoring rough zone events in the diversion reach of the lower Mamquam Hydroelectric project, attached please find our opinion on this issue.

Regards, Adam

FJ Adam Lewis, M.Sc. R.P.Bio.
Principal, Senior Biologist

Ecofish Research Ltd.

fjalewis@ecofishresearch.com
www.ecofishresearch.com

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April 15, 2011

Reference: 1071-04.09

Capital Power Corporation
P.O. Box 5383
Squamish, B.C.
V8B 0C2

Attention: Jena Tufts and Marc Nering

Dear Sir/Madam:

Re: Lower Mamquam Hydroelectric Project Diversion Rough Zone Ramping Monitoring

Capital Power Corp. (CPC) has retained Ecofish Research Ltd. (Ecofish) to assess rough zone ramping issues at the Lower Mamquam Hydroelectric Project (the Project) in the diversion reach, downstream of the intake, and upstream of the tailrace. Fisheries and Oceans Canada (DFO) requires a letter documenting knowledge of stranding events in the diversion reach, specifically explaining difficulties associated with monitoring risk (i.e., safety issues of night-time access for rough zone events) and risk to fish due to rough zone ramping.

Ecofish has completed ramping monitoring downstream of the tailrace for numerous events and has collected fish abundance data for the upstream, diversion, and downstream areas of the Project. One rough zone ramping event was monitored in the diversion reach. Background information regarding diversion reach fish abundance, fish habitat, and previous ramping monitoring is presented in Lewis *et al.* (2011).

The diversion reach is located above a 20 m falls, which is an impassible migratory barrier for anadromous fish. Baseline sampling detected Dolly Varden sub-adults, but no fry and no rainbow trout, thus the diversion reach originally lacked the life stages expected to be sensitive to ramping. However, sampling during 2010 detected rainbow trout fry in the diversion reach, as summarized in Lewis *et al.* (2011).

On October 22, 2010, Ecofish crews were conducting fish sampling in the diversion reach and a rough zone start up event occurred, causing a rapid stage decrease in the diversion. Crews searched for stranded or isolated fish in the four electrofishing sample sites following the ramping event. There are only two possible routes into the canyon that don't require rappelling, and limited access to the canyon at its upstream and downstream ends. Once crews had accessed the monitoring sites, the rough zone event was complete and discharge was constant.

The field crew performed searches by hand and visually searched a broad area of 240 m^2 at MQM-DVEF01 and MQM-DVEF02 for approximately 60 minutes. During this time, crew turned over rocks and looked for hotspots, although neither potential stranding areas nor hotspots were identified due to the channelized morphology and lack of gravel. No stranded or isolated fish were observed. Closed site electrofishing was completed at all four sites (MQM-DVEF01-04) and photos of all sites are included in Appendix A. Data from the permanent gauge (MQM-DVLG02) located slightly upstream of the powerhouse were used to calculate total stage change, maximum stage change rate, and average stage change, which is presented in Table 1. Plots of the rate of stage change in the lower diversion at MQM-DVLG02 and of discharge at the downstream gauge (MQM-DSLG01, stage-discharge curve has not yet been developed for MQM-DVLG02) are provided in Figure 1 and Figure 2, respectively.

Table 2 provides a summary of the monitoring sites searched on October 22, 2010. Also provided in the table are the fish species and life stages known to be present at the monitoring sites.

Table 1. **Total stage change, maximum stage change rate, and average stage change rate observed at MQM-DVLG02 during the rough zone start up event on October 22, 2010.**

Start Time	End Time	Duration (min)	Stage Start (cm)	Stage End (cm)	Stage Change		
					Total (cm)	Max Rate (cm/hr)	Average (cm/hr)
7:00	10:15	195.0	101.4	55.0	-46.40	-34.30	-14.28

Figure 1. Plot of rate of stage change recorded at MQM-DVLG02 during the rough zone start up event on October 22, 2010.

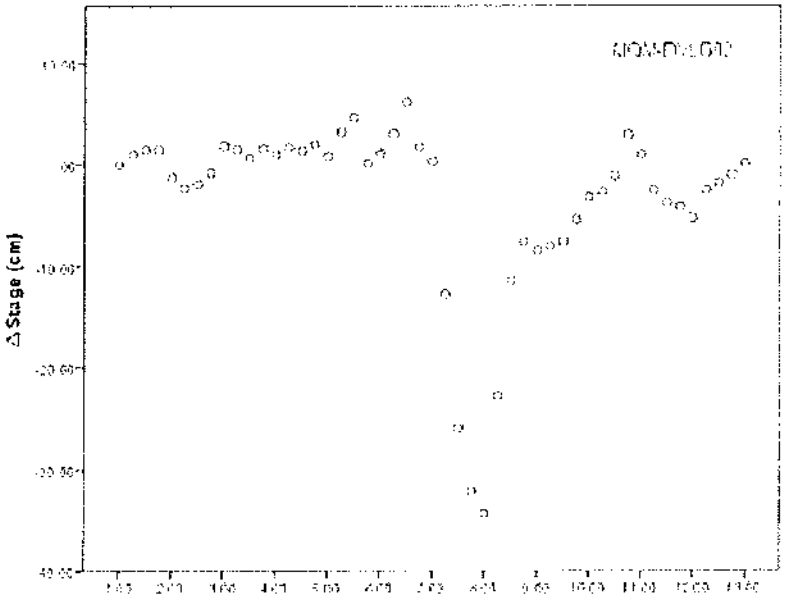
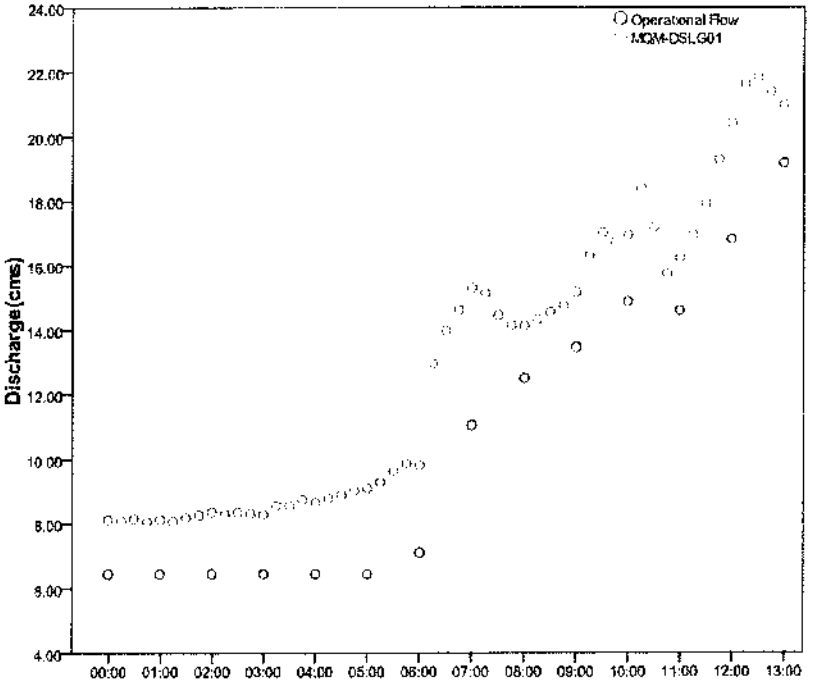


Figure 2. Plot of discharge recorded at MQM-DSLG01 and operational flow (flow diverted through the penstock to the powerhouse) during the rough zone start up event on October 22, 2010.



ECOFISH RESEARCH

Table 2. **Summary of monitoring sites, broad based search time, hot spot search time and area, fish species and life stages known to be present at the sites.**

Monitoring Site	Broadbased Search* (sec)	Hot Spot Search		Fish Presence	
		Time (Min)	Area (m^2)	Species	Life Stage
MQM-DVEF01	1891	30	120	RT	Fry
				DV	Parr 1+
MQM-DVEF02	1836	30	120	RT	Fry
				DV	N/a
MQM-DVEF03	1000	0	0	RT	Fry, Parr 1+
				DV	Fry
MQM-DVEF04	2464	0	0	RT	Fry
				DV	Fry, Parr 2+

'-' No searching conducted RT= Rainbow Trout DV = Dolly Varden

*time represents total electrofishing seconds as a measure of level of effort

Conclusion

The Project's rough zone is a concern during both startup and shutdown events. To date, rough zone monitoring has concentrated on shutdown events due to the stranding risk and observed stranding in the downstream reach, which is anadromous salmon spawning habitat. The Project's diversion reach is difficult to access, and access poses a significant safety concern, particularly during winter, when ice and snow cover felled trees and safe footing is not always available. Under circumstances when rough zone monitoring must be conducted at night, access to the diversion reach under any conditions is also deemed to be unsafe.

Given that baseline fish sampling showed that the diversion reach did not support fry, the diversion reach was assumed to have a low risk of significant mortality from stranding. The presence of fry during operational monitoring suggests that the channel is now suitable for this life stage, however, the channelized morphology lacks significant amounts of habitat that typically pose a risk to stranding. During the October 22, 2010 event, rainbow trout fry were confirmed present at the monitoring sites, but none were found to be stranded or isolated during the broad based or hot spot searches. Given these observations, the risk to fish stranding in the diversion reach is low.

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The difficulty in accessing the diversion reach and the requirement to do so during winter or at night during any season creates unsafe conditions. The combination of the low risk of stranding and safety issues leads us to recommend no monitoring of rough zone events in the diversion reach. However, if future ramping tests are conducted, diversion reach monitoring may be included, as these can be timed during daylight conditions and ice/snow-free conditions, when safe access can be assured.

Yours truly,
Ecofish Research Ltd.

Adam Lewis, M.Sc., R.P.Bio.
Fisheries Biologist/Principal

Elyse MacDonald
Biologist/Project Manager
B.Sc., R.P.Bio.

ECOFISH RESEARCH

References

Lewis, A., K. Ganshorn, A. O'Toole, A. Newbury, D. Lacroix, and L. Walker. 2011. Lower Mamquam Hydroelectric Project: Interim Monitoring Report – Year 1. Consultant's report prepared for Capital Power Corporation by Ecofish Research Ltd, March 31, 2011.

Lewis, A. and A.J. Harwood. 2009. Operational Environmental Aquatic Monitoring Guidelines for New and Upgraded Hydroelectric Projects, Draft V3. Consultant's report prepared for DFO.

Triton Environmental Consultants Ltd. 1992. Mamquam River hydroelectric impact assessment. Prepared by A.F. Lewis, P.S. Higgins, A.C. Mitchell, and B.T. Guy for Northern Utilities Inc.

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Appendix A

Figure 1. Photo of the diversion reach rough zone ramping monitoring site MQM-DVEF01, October 22, 2010.

Figure 2. Photo of the diversion reach rough zone ramping monitoring site MQM-DVEF02, October 22, 2010.

Figure 3. Photo of the diversion reach rough zone ramping monitoring site MQM-DVEF03, October 22, 2010.

Figure 4. Photo of the diversion reach rough zone ramping monitoring site MQM-DVEF04, October 22, 2010.

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:34 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam Rough Zone Ramping Strands Fry

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Marc Nering [mailto:mnering@capitalpower.com]
Sent: Sunday, April 17, 2011 9:49 PM
To: Busto, Vince; 'Knight, Francesca'; Bennett, Timothy A FLNR:EX
Cc: Rudy Barrett; Michael Smith; Jena Tufts
Subject: FW: Mamquam Rough Zone Ramping Strands Fry

On April 15 at 16:30, Mamquam operations ramped G1 down through the rough zone due to falling river levels. A very circumspect ramping procedure was followed, and Ecofish was notified and had personnel standing by in the river channel at the 2 stranding hot spots prior to ramping . I received verbal notification late Friday night from Ecofish that 2 fry in the upstream location, and 8 fry by the highway bridge location were stranded and killed. I have not yet received a written report from Ecofish with analysis confirming that the Mamquam plant is responsible.

The ramp procedure submitted to DFO was to ramp from 16MW down to 9MW. Trying to improve on that, when river levels dropped plant output to 16MW, operations ramped down to 14MW at the allowable ramping rate of 2.5cm/hour level change using the PLC programming installed earlier this year. Once the unit stabilized at 14MW, operations waited for spill to occur over the intake weirs, and flow down to the powerhouse. This took almost two hours.

When the spill was confirmed reaching the powerhouse, the unit was then rapidly ramped from 14MW down to 9MW to avoid damage to the turbine. To improve on this by further narrowing the rough zone could damage the turbine. A similar ramp through the rough zone 1 week ago stranded no fish/fry.

At this point in time there were no other options available to the plant but to drop through the rough zone due to falling river levels. Continuous operation below 14MW in power range could damage the turbine, as vibration levels peaked at maximum operable levels at 14MW (120 micrometers displacement).

Engineering is evaluating reprogramming the PRV (bypass valve) to open during rough zone ramping, but that has not been completed yet. In addition, G2's new runner which is expected to have a narrower rough zone, has not been commissioned yet, and has exceeded the project scheduled completion date due to a number of issues. Commissioning is expected to start April 26.

Additionally, river flows are significantly lower than normal for this time of the year due to unseasonably cold weather for the area. Typically rough zone ramping doesn't occur beyond early April due to higher flows from snow melt. We received fresh snow in the higher elevations April 14 and freezing temperatures overnight, causing the reduction in river flows.

Marc Nering

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:34 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam rough zone ramping memo for April 15, 2011
Attachments: Memo to Marc Nering re 15-Apr-11 Ramping Rate Monitoring.pdf

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Marc Nering [mailto:mnering@capitalpower.com]
Sent: Tuesday, April 19, 2011 6:11 AM
To: Busto, Vince; 'Knight, Francesca'; Bennett, Timothy A FLNR:EX
Cc: Jena Tufts; Michael Smith; Rudy Barrett
Subject: FW: Mamquam rough zone ramping memo for April 15, 2011

Vince/Francesca,

Please see attached for Ecofish report on April 11 ramping.

Marc

From: Elyse MacDonald [mailto:emacdonald@ecofishresearch.com]
Sent: Monday, April 18, 2011 3:38 PM
To: Marc Nering; Jena Tufts
Subject: Mamquam rough zone ramping memo for April 15, 2011

Good afternoon,
Attached please find the rough zone ramping memo for the event last Friday. As mentioned to Marc by phone on Friday night, we found stranded fish. Two stranded fish were found at the site closest to the powerhouse and 8 fish were found at the highway bridge, however 3 of these fish were found alive and returned to the Mamquam River. In total, 7 dead fish were found.

Please see the attached memo for more description of the event.

Please let me know if you have any questions.

Regards,

Elyse MacDonald, B.Sc., R.P.Bio., CPESC
Environmental Biologist, Project Manager

Ecofish Research Ltd.

ECOFISH RESEARCH

emacdonald@ecofishresearch.com
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Voice: 250 334-3042; Fax: 250 897-1742

ECOFISH RESEARCH

MEMORANDUM

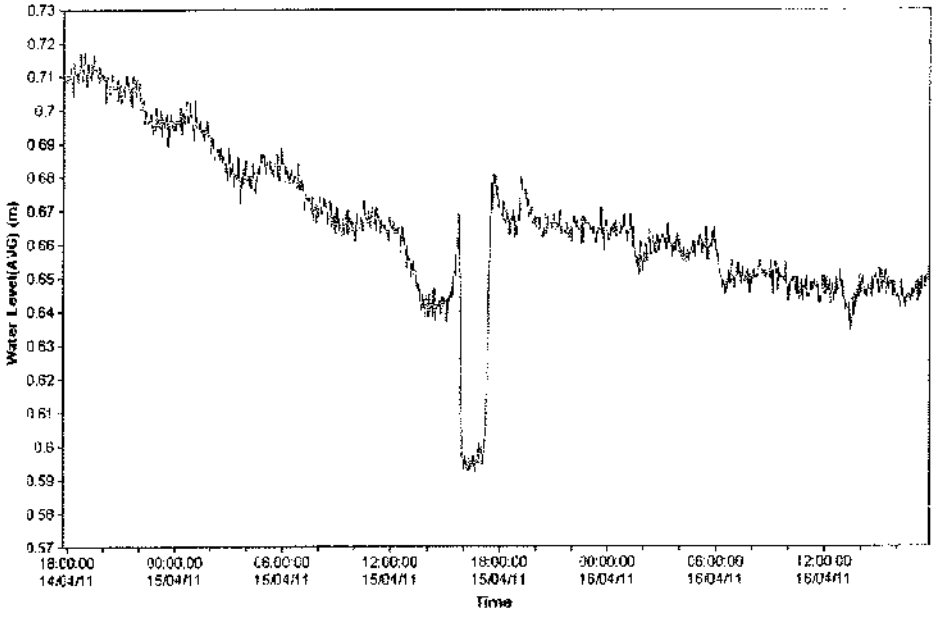
TO: Marc Nering
FROM: Elyse MacDonald
DATE: April 18, 2011
FILE: 1071-04.09

RE: Mamquam River Ramping Rate Monitoring

This memo describes the observations made during ramping rate monitoring conducted for Capital Power on the Mamquam River run-of-river hydroelectric project. Ramping through the rough zone occurred in the evening of April 15. The plant was held at 15MW for as long as possible, and then ramped at a rate to effect 2.5 cm/hr at the downstream permanent gauge (MQM-DSLG01) until generation was 14 MW. At approximately 16:00 hrs, the plant quickly ramped through the rough zone to 9 MW.

Crews were onsite to monitor fish stranding during the event. Broad-based and 'hot spot' searches for stranded fish were conducted at the most upstream site (MQM-DSSD01), ~585 m downstream of the tailrace, first, arriving at 16:50 hrs. A total of 100 m^2 was searched in 70 min. Crews then moved to the furthest downstream site, MQM - DSDS02 ~5.1 km downstream of the tailrace, and arrived at 18:08 hrs. 80 m^2 was searched in 60 min.

The downstream, permanent gauge (MQM-DSLG01) recorded the events:



Stage change was assessed based on recorded stage at MQM-DSLG01. Stage at 15:00 hrs was 0.642 m. The stage rose to 0.669 m at 15:46, before ramping down through the rough zone. Ramping through the rough zone occurred between 15:46 – 17:06 hrs with a total stage decrease of 10.5 cm, however, given the preceding rise in stage between 15:00 – 15:46 hrs, the total stage decrease from 15:00 hrs to 17:06 hrs was 4.8 cm. Stage returned to pre-ramping levels, 0.669 m, by 18:04 hrs.

Table 1, below summarizes the stage change and rate of change as a resulting of the stage increase prior to the rough zone ramping, ramping down through the tough zone, and the return to pre-ramping stage. The total stage change and rate of change is also calculated for the overall rate between 15:00 – 17:06 hrs, as it is unlikely fish would move into marginal area in the 46 min of stage increase prior to rough zone ramping. All rates are estimates based on 2 minute interval gauge data.

Table 1. Summary of stage change, incident duration, and rate of change during ramping April 15, 2011

Date, Incident Start Time (hrs)	Date, Incident End Time (hrs)	Stage Start (m)	Stage End (m)	Total Stage Change (m)*	Duration of Stage Change (hr)	Rate of Stage Change (m/hr)*
Apr.15, 15:00	Apr.15, 15:46	0.642	0.669	0.027	0.767	0.035
Apr.15, 15:46	Apr.15, 17:06	0.699	0.594	-0.105	1.333	-0.079
Apr.15, 17:06	Apr.15, 18:04	0.594	0.669	0.075	0.967	0.078
Apr.15, 15:00	Apr.15, 17:06	0.642	0.594	-0.048	2.100	-0.023

* negative numbers indicate stage decrease

Water temperature was approximately 4.0 °C during the evening in the Mamquam River. At MQM-DSSD01, two stranded salmonids (Figure 1) were found (60 mm and 40 mm fork length) in the area that had dewatered (Figure 2) while crews were onsite and had observed decreasing stage change. At MQM-DSSD02, crews found a total of 8 stranded fry, 3 of which were salvaged and returned to the river alive (Figure 3 and Figure 4). Crews searched in marginal habitat where substrate was wet, indicating the dried area due to ramping (Figure 5).

Figure 1. Stranded salmonid fish found at MQM-DSSD01.

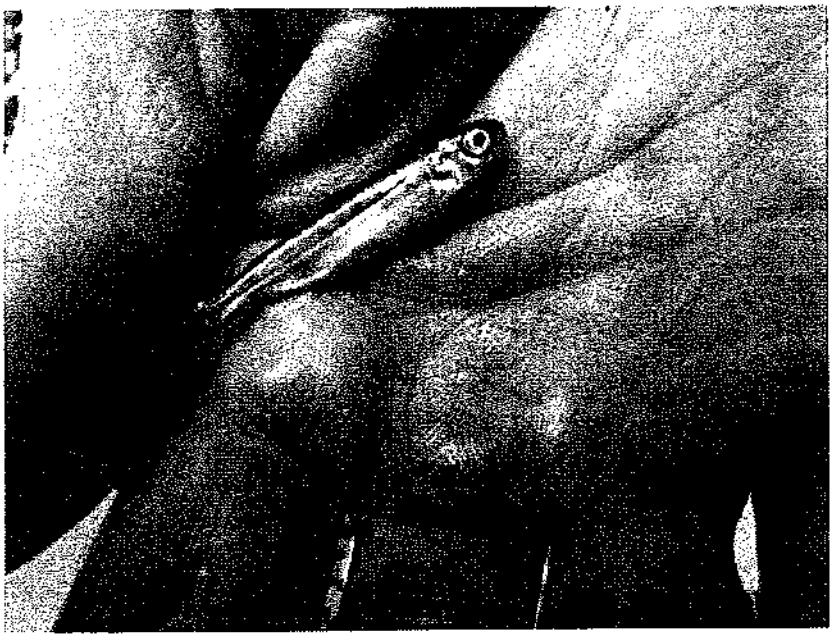


Figure 2. Red arrow indicates area of observed dried habitat where stranded salmonids fish were found at MQM-DSSD01.

Figure 3. Stranded salmonid fish found at MQM-DSSD02.

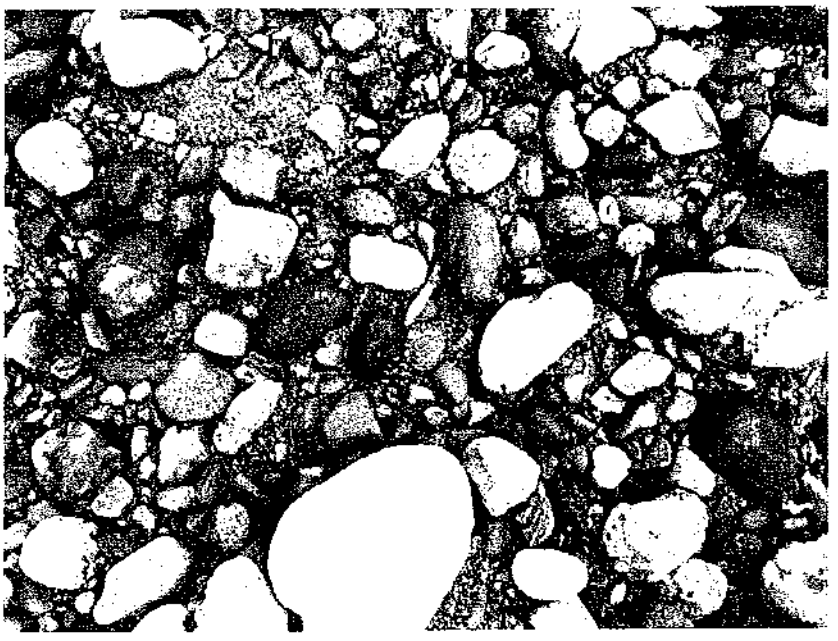


Figure 4. Stranded salmonid mortalities found at MQM-DSSD02.

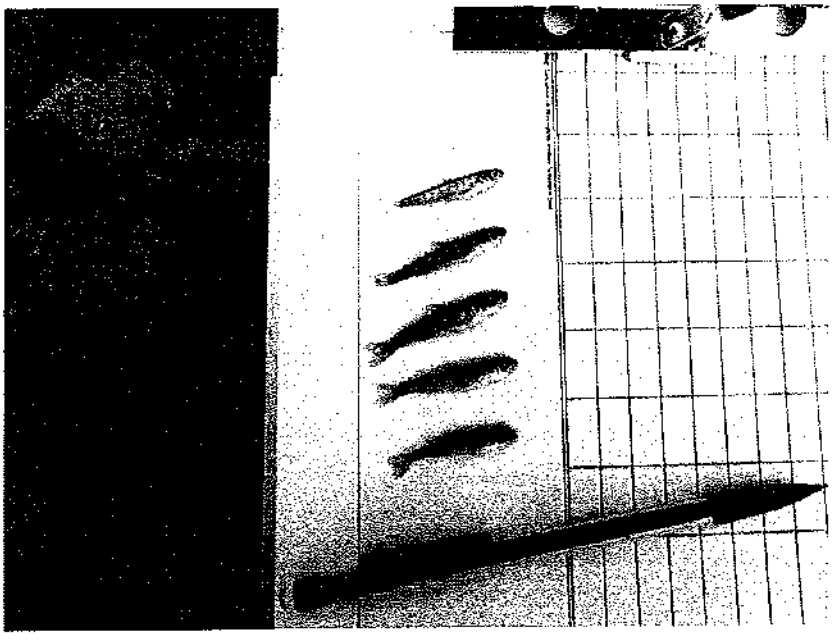


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Figure 5. **Red arrow indicates area of observed dried habitat where stranded fish were found at MQM-DSSD02.**

We recommend that Ministry of Environment and Ministry of Natural Resource Operations as well as Fisheries and Oceans Canada be notified of this stranding event as soon as possible.

Yours truly,

Ecofish Research Ltd.

signed

Elyse MacDonald, B.Sc., R.P.Bio., CPESC

Project Manager, Environmental Biologist

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:34 AM
To: Becker, Judy S ENV:EX
Subject: FW: HADD's and fish kills (RE: Mamquam rough zone ramping memo for April 15, 2011)

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Busto, Vince [mailto:Vince.Busto@dfo-mpo.gc.ca]
Sent: Tuesday, April 19, 2011 2:33 PM
To: Marc Nering; Knight, Francesca; Bennett, Timothy A FLNR:EX
Cc: Jena Tufts; Michael Smith; Rudy Barrett; emacdonald@ecofishresearch.com; Clark, John
Subject: HADD's and fish kills (RE: Mamquam rough zone ramping memo for April 15, 2011)

Marc

Thank you for the draft report.

I have read through the draft and stand by the comments presented by DFO to Capital Power in the e-mail we sent yesterday afternoon. The plant must be operated in a manner that does not harmfully alter, disrupt or destroy (HADD) fish habitat, or kill fill. Operation of the plant that results in a HADD or kills fish, that is not specifically permitted through a Fisheries Act Authorization provided to Capital Power, is a contravention of the Fisheries Act. DFO provided two suggestions as that may allow Capital Power to operate without contravening sections 35 and/or 32 of the Fisheries Act. As you recall, those suggestions were:

1. operating below 9 MW during times of the year when fry are present (such as in the fall for newly emerged steelhead and during the late winter-early spring for other species of anadromous salmonids); or

2. operating with a higher IFR ("riparian flow release" from the intake) such that ramping effects will not adversely impact fry.

DFO expects that Capital Power will investigate, without delay, which of the two suggestions would allow the plant to maintain acceptable ramping rates downstream of the plant, or sufficient flow such that plant operation impacts to fry and juvenile fish are mitigated.

As far as the draft report by Ecofish is concerned, it would be useful to know what he flows were within the diversion reach and downstream of the power plant during the incident of April 15, 2011.

I look forward to continuing our further discussion and resolution of this matter.

Vince Busto, B.A.Sc., P.Eng.
Habitat and Hydrotechnical Engineer | Ingénieur de l'habitat et de l'hydrotechnique
Habitat and Enhancement Branch | Protection et mise en valeur des habitats
Lower Fraser River | Le bas Fraser
Fisheries and Oceans Canada | Pêches et Océans Canada
100 Annacis Parkway, Unit 3 | 100 Annacis Parkway, Unit 3

Delta, BC V3M 6A2 | Delta (C.-B.) V3M 6A2
Government of Canada | Gouvernement du Can

Telephone/Téléphone 604-666-8281
Facsimile / Télécopieur 604-666-6627

Pacific Region 'Working Near Water' website

http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm

From: Marc Nering [mailto:mnering@capitalpower.com]
Sent: April 19, 2011 6:11 AM
To: Busto, Vince; Knight, Francesca; 'Timothy.Bennett@gov.bc.ca'
Cc: Jena Tufts; Michael Smith; Rudy Barrett
Subject: FW: Mamquam rough zone ramping memo for April 15, 2011

Vince/Francesca,

Please see attached for Ecofish report on April 11 ramping.

Marc

From: Elyse MacDonald [mailto:emacdonald@ecofishresearch.com]
Sent: Monday, April 18, 2011 3:38 PM
To: Marc Nering; Jena Tufts
Subject: Mamquam rough zone ramping memo for April 15, 2011

Good afternoon,
Attached please find the rough zone ramping memo for the event last Friday. As mentioned to Marc by phone on Friday night, we found stranded fish. Two stranded fish were found at the site closest to the powerhouse and 8 fish were found at the highway bridge, however 3 of these fish were found alive and returned to the Mamquam River. In total, 7 dead fish were found.

Please see the attached memo for more description of the event.

Please let me know if you have any questions.

Regards,

Elyse MacDonald, B.Sc., R.P.Bio., CPESC
Environmental Biologist, Project Manager

Ecofish Research Ltd.

emacdonald@ecofishresearch.com
www.ecofishresearch.com

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Voice: 250 334-3042; Fax: 250 897-1712

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:34 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam Bi-Weekly Update - April 20, 2011
Attachments: Memo to Marc Nering re 7-April 2011 Ramping Rate Monitoring.pdf

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: Wednesday, April 20, 2011 3:42 PM
To: 'Busto, Vince'; 'Knight, Francesca'
Cc: Bennett, Timothy A FLNR:EX; Stoddard, Erin M FLNR:EX; Babakaiff, Scott C FLNR:EX; Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; 'fjalewis@ecofishresearch.com'
Subject: Mamquam Bi-Weekly Update - April 20, 2011

Hello Francesca and Vince,

In response to the latest incident that occurred on April 15, 2011, Mamquam operations will remain under 9 MW until freshet flow from melting snow (not rainfall) guarantees uninterrupted operation well above the rough zone (25 MW minimum).

Since our meeting at Mamquam on April 6, the corrective actions that were provided in the letter dated April 8, 2011 are progressing.

1. The river level gauges have been installed.
2. The communication cable has been installed.
3. The PLC cards, which connect the river level gauges, have been ordered; unfortunately, we do not have an estimated time of delivery for these PLC cards.
4. Mamquam runner installation is progressing, however, due to some unforeseen delays and issues in re-assembling the unit, the expected target date for the runner installation to be completed is May 7. A draft commissioning procedure has been developed and Ecofish is currently reviewing this procedure.

5. Mamquam operations dropped through the rough zone on April 7, 2011; no stranded fish were found. The memo provided from Ecofish for this rough zone ramping event is attached.
The following table summarizes the corrective actions, task owner and target date.

	Corrective Action	Task Owner	Target Date
1	Update manual control procedure to prevent future re-occurrence of plant ramping up through rough zone, flows not able to sustain increased generation and then ramping down through rough zone.	Marc Nering	Completed
2	CPC to provide Fisheries and Oceans and the B.C. Ministry of Environment the corrective action schedule that was developed to mitigate ramping and fish stranding concerns.	Michael Smith	Completed

3	CPC to confirm viability of reducing the rough zone ramping range from 9-16 MW to 9-1. MW.	Marc Nering	Completed
4	CPC to provide a professional biologist's opinion regarding monitoring in the diversion reach.	Jena Tufts	Completed
5	A new runner on Unit 2 turbine is currently being installed. This new runner will reduce the rough zone avoidance range that is currently causing high vibrations that are detrimental to the turbine.	Marc Nering	**7-May-11** changed from May 1, 2011
6	Vibration testing of new runner to determine new rough zone avoidance range.	Marc Nering	31-May-11
7	During commissioning of unit 2, determine and provide the relationship between rough zone ramping, vibrations and flow monitoring.	Marc Nering	15-Jun-11
8	Six new flow/level sensors, 3 below intake to measure spill and 3 below the powerhouse to measure total river flow, will be installed.	Marc Nering	Completed
9	Cable will be installed to directly connect the river flow gauges to the PLC programming.	Marc Nering	Completed
10	PLC programming will be updated to include the live data from the river level gauges.	Marc Nering	30-Jun-11
11	CPC to notify Fisheries and Oceans and the Ministry of Environment of any subsequent rough zone ramping events that occur until the corrective actions have been fully implemented.	Marc Nering	As Required
12	CPC to provide bi-weekly updates on the progress and challenges occurring at Mamquam.	Jena Tufts	Ongoing

Please don't hesitate to contact me if you have any questions.

Best Regards,
Jena

Jena Tufts, M.Sc., E.I.T.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5522 | jtufts@capitalpower.com


Please consider the environment before printing this e-mail

ECOFISH RESEARCH

MEMORANDUM

TO: Marc Nering
FROM: Elyse MacDonald
DATE: April 18, 2011
FILE: 1071-04.09

RE: Mamquam River Ramping Rate Monitoring

This memo briefly describes the observations made during ramping rate monitoring conducted for Capital Power on the Mamquam River run-of-river hydroelectric project on April 7, 2011. Ramping through the rough zone occurred on April 7 at approximately 21:34 hrs (all times PDT).

Crews were onsite to monitor potential fish stranding after the rough zone ramping event. A hand-based search was conducted at the previously established site downstream of the Highway 99 Bridge (MQM-DSSD02) between 22:45 hrs and 00:15 hrs. An area of 200 m^2 of the stream margin was hand searched for a total of 40 minutes at this site by two people (100 m upstream and downstream of the bridge). No fish were found.

The site downstream of the powerhouse (MQM-DSSD01) was not searched due to safety concerns associated with access after dark.

Stage change was assessed based on recorded stage downstream of the powerhouse (Figure 1). Table 1, below summarizes the stage change and rate of change as a result of ramping down through the rough zone for the April 7, 2011 incident. The largest decline rate occurred at approximately 21:34 - 21:56 hrs and was -7.9 cm (64.7 cm to 56.8 cm in 22 min). Discharge at the beginning of the incident was 6.32 cms and 4.53 cms at the end of the incident.

This rough zone incident was minimized as operations continued at 14 MW until it was clear stage increases due to snow melt or forecast rain would not be realized and generation was required to be reduced to 9 MW.

Figure 1. Water levels recorded at MQM-DSLG01 during the ramping event on March 20, 2011.

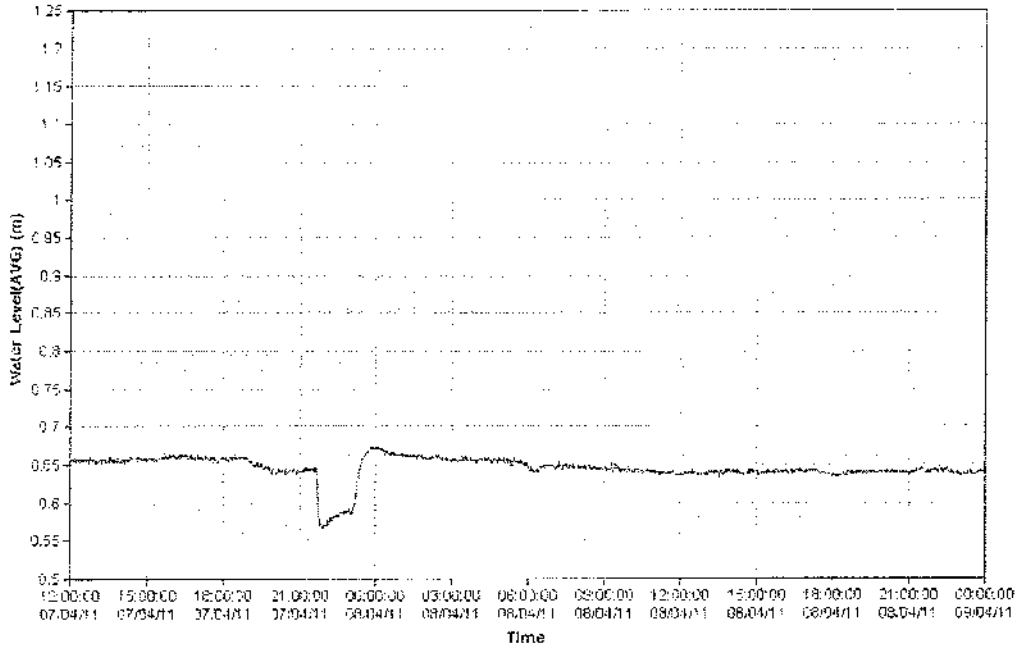

Table 1. Summary of stage change, incident duration, and rate of change on April 7, 2011.

Logger	Date, Incident Start Time (mins)	Date, Incident End Time (mins)	Event Duration (mins)	Stage Start (m)	Stage End (m)	Total Stage Change (cm)*	Avg. Rate of Stage Change (cm/hr)*	Discharge Start (cms)	Discharge End (cms)
MQM-DSLG01	April 7, 21:34	April 7, 21:56	22	0.617	0.568	-7.9	-21.55	6.32	4.53

* Negative number indicates stage decrease

ECOFISH RESEARCH

Yours truly,

Ecofish Research Ltd.

signed

Elyse MacDonald, M.Sc., R.P.Bio., CPESC

Environmental Biologist, Project Manager

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:34 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam Bi-Weekly Update - April 20, 2011

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Knight, Francesca [mailto:Francesca.Knight@dfo-mpo.gc.ca]
Sent: Thursday, April 21, 2011 8:54 AM
To: Jena Tufts; Busto, Vince
Cc: Bennett, Timothy A FLNR:EX; Stoddard, Erin M FLNR:EX; Babakaiff, Scott C FLNR:EX; Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; fjalewis@ecofishresearch.com
Subject: RE: Mamquam Bi-Weekly Update - April 20, 2011

Hi Jena,
thank you for making the operational decision to maintain the plant operation at or below 9 MW until natural flows are sufficient to enable safer ramping through the rough zone.
I look forward to reviewing the commissioning procedure.
regards,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
Oceans, Habitat and Enhancement Branch / Direction des océans, de l'habitat et de la mise valeur
Lower Fraser River - Le Bas Fraser
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Delta, BC V3M 6A2
Francesca.Knight@dfo-mpo.gc.ca

Ph: (604) 666-3191 / Fax: (604) 666-6627
Squamish phone: 604-892-2040
Government of Canada - Gouvernement du Canada

Pacific Region 'Working Near Water' website
http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm

From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: April 20, 2011 3:42 PM
To: Busto, Vince; Knight, Francesca
Cc: 'Timothy.Bennett@gov.bc.ca'; 'Stoddard, Erin '; 'Babakaiff, Scott'; Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; 'fjalewis@ecofishresearch.com'
Subject: Mamquam Bi-Weekly Update - April 20, 2011

Hello Francesca and Vince,

In response to the latest incident that occurred on April 15, 2011, Mamquam operations will remain under 9 MW until freshet flow from melting snow (not rainfall) guarantees uninterrupted operation well above the rough zone (25 MW minimum).

Since our meeting at Mamquam on April 6, the corrective actions that were provided in the letter dated April 8, 2011 are progressing.

1. The river level gauges have been installed.
2. The communication cable has been installed.
3. The PLC cards, which connect the river level gauges, have been ordered; unfortunately, we do not have an estimated time of delivery for these PLC cards.
4. Mamquam runner installation is progressing, however, due to some unforeseen delays and issues in re-assembling the unit, the expected target date for the runner installation to be completed is May 7. A draft commissioning procedure has been developed and Ecofish is currently reviewing this procedure.

5. Mamquam operations dropped through the rough zone on April 7, 2011; no stranded fish were found. The memo provided from Ecofish for this rough zone ramping event is attached.
The following table summarizes the corrective actions, task owner and target date.

	Corrective Action	Task Owner	Target Date
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2	CPC to provide Fisheries and Oceans and the B.C. Ministry of Environment the corrective action schedule that was developed to mitigate ramping and fish stranding concerns.	Michael Smith	Completed
3	CPC to confirm viability of reducing the rough zone ramping range from 9-16 MW to 9-15 MW.	Marc Nering	Completed
4	CPC to provide a professional biologist's opinion regarding monitoring in the diversion reach.	Jena Tufts	Completed
5	A new runner on Unit 2 turbine is currently being installed. This new runner will reduce the rough zone avoidance range that is currently causing high vibrations that are detrimental to the turbine.	Marc Nering	**7-May-11** changed from May 1, 2011
6	Vibration testing of new runner to determine new rough zone avoidance range.	Marc Nering	31-May-11
7	During commissioning of unit 2, determine and provide the relationship between rough zone ramping, vibrations and flow monitoring.	Marc Nering	15-Jun-11
8	Six new flow/level sensors, 3 below intake to measure spill and 3 below the powerhouse to measure total river flow, will be installed.	Marc Nering	Completed
9	Cable will be installed to directly connect the river flow gauges to the PLC programming.	Marc Nering	Completed
10	PLC programming will be updated to include the live data from the river level gauges.	Marc Nering	30-Jun-11

11	CPC to notify Fisheries and Oceans and the Ministry of Environment of any subsequent rough zone ramping events that occur until the corrective actions have been fully implemented.	Marc Nering	As Required
12	CPC to provide bi-weekly updates on the progress and challenges occurring at Mamquam.	Jena Tufts	Ongoing

Please don't hesitate to contact me if you have any questions.

Best Regards,
Jena

Jena Tufts, M.Sc., E.I.T.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5522 | jtufts@capitalpower.com

Please consider the environment before printing this e-mail

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:34 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam Bi-weekly Update - May 4, 2011
Attachments: Mamquam Commissioning Procedure - G2.doc

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: Wednesday, May 4, 2011 3:35 PM
To: 'Busto, Vince'; 'Knight, Francesca'
Cc: Bennett, Timothy A FLNR:EX; Stoddard, Erin M FLNR:EX; Babakaiff, Scott C FLNR:EX; Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; 'Elyse MacDonald'; 'fjalewis@ecofishresearch.com'
Subject: Mamquam Bi-weekly Update - May 4, 2011

Hello Vince and Francesca,

Runner installation at Mamquam is progressing, however, the contractor is behind schedule; commissioning of the unit is expected to begin between May 9 and May 16. As requested, please find attached a procedure outlining both the operational and environmental considerations for unit 2 commissioning. The environmental considerations outlined in the attached procedure were taken from the project proposal and cost estimate that Ecofish provided for the commissioning of unit 2.

The following table summarizes the corrective actions, task owner and target date.

	Corrective Action	Task Owner	Target Date
1	Update manual control procedure to prevent future re-occurrence of plant ramping up through rough zone, flows not able to sustain increased generation and then ramping down through rough zone.	Marc Nering	Completed
2	CPC to provide Fisheries and Oceans and the B.C. Ministry of Environment the corrective action schedule that was developed to mitigate ramping and fish stranding concerns.	Michael Smith	Completed
3	CPC to confirm viability of reducing the rough zone ramping range from 9-16 MW to 9-15 MW.	Marc Nering	Completed
4	CPC to provide a professional biologist's opinion regarding monitoring in the diversion reach.	Jena Tufts	Completed
5	A new runner on Unit 2 turbine is currently being installed. This new runner will reduce the rough zone avoidance range that is currently causing high vibrations that are detrimental to the turbine.	Marc Nering	7-May-11

6	Vibration testing of new runner to determine new rough zone avoidance range.	Ma... Ne...g	31-May-11
7	During commissioning of unit 2, determine and provide the relationship between rough zone ramping, vibrations and flow monitoring.	Marc Nering	15-Jun-11
8	Six new flow/level sensors, 3 below intake to measure spill and 3 below the powerhouse to measure total river flow, will be installed.	Marc Nering	Completed
9	Cable will be installed to directly connect the river flow gauges to the PLC programming.	Marc Nering	Completed
10	PLC programming will be updated to include the live data from the river level gauges.	Marc Nering	30-Jun-11
11	CPC to notify Fisheries and Oceans and the Ministry of Environment of any subsequent rough zone ramping events that occur until the corrective actions have been fully implemented.	Marc Nering	As Required
12	CPC to provide bi-weekly updates on the progress and challenges occurring at Mamquam.	Jena Tufts	Ongoing

Best Regards,
Jena

Jena Tufts, M.Sc., E.I.T.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5522 | jtufts@capitalpower.com

Mamquam Generating Station

Operations Procedure

SUBMITTED BY:	JENA TUFTS	DATE:	MAY 3, 2011
APPROVED BY:	MARC NERING	DATE:	May 3, 2011
REVISION NO. 1		REVISED BY:	DATE REVISED:

UNIT 2 COMMISSIONING – MAY 2011

INTRODUCTION: This procedure details the operational and environmental steps for commissioning unit 2.

RESPONSIBILITIES: Operations staff are required to follow this procedure

DEFINITIONS:

Rough Zone – Between 9-16MW the Mamquam units experience resonance. This causes high vibrations which are highly detrimental to the turbine.

Ramping – The process of raising or lowering unit output, and the time it takes to achieve this.

River staff gauge – The gauge in the river that operators can view to determine water level

HMI – Human Machine Interface (the unit control screen)

OPERATIONAL PROCEDURE:

Step One

Ensure unit is ready for operation:

- All unit parameters in spec (bearing clearances, brush gear, etc.)
- Receiving correct signal from all rtd's (bearings, bearing sumps, stator, etc.)
- Receiving correct readings from vibration probes
- Cooling water system checked for leaks
- Tyton seal pressured up check for leaks (seal air/barrier water/flush water)
- Oil reservoirs filled to correct level and reading correctly on HMI
- 86R trip wire re-connected
- Brake lines installed
- Speed sensor installed
- Brush gear/grounding brush installed
- Purge air/vac extract working
- etc

Step 2

Take plant offline:

- Ramp down G1
- Do not exceed 2.5cm/hr river level change while ramping
- Take plant offline and lock out units for diver entry

Water Up G2:

- Divers to remove PRV plug
- Cross flood G2 draft tube
- Check for leaks in shaft seal, head cover area, and draft tube
- Lift stop log

Restart G1:

- Remove lockout G1
- Bring G1 back online and ramp at allowable rate

Step Three

Perform functional checks G2:

- Create temporary lift on lockout for HPU/lift pump operation
- Check wetted wicket gate/PRV operation and timing (SKT to set up recording equipment)
- Check lift pump/pressure switch operation
- Check seal pump operation
- Check air seal operation
- Check brake operation
- Check speed pickup operation
- Etc.

Step Four

Stage 1 Unit Rolling Procedure:

- Remove lockout
- Prepare log sheet for recording unit rpm/bearing temps/vibration
- Vibration technician to set up recording equipment
- Have operations staff at all levels to check for leaks/noises/ etc.
- Ensure lift pump is operational (should be known already, since they will have done rotations)
- Open TIV seals
- Open wicket gates to initiate slow roll
- Once rolling, continually monitor/record all operating parameters
- Open wicket gates in increments to 100% while recording operating parameters
- Let unit roll at 100% for 15 minutes to ensure proper operation
- Once satisfied, close seals and wicket gates
- Ensure brakes work while stopping unit

Stage 2 Unit Rolling Procedure:

- Open TIV
- Open wicket gates to start unit rolling
- Record unit parameters
- Open wicket gates in increments to achieve 50/100/150/200 etc. until 650 rpm is reached (while recording unit parameters throughout)
- Remain at 650 rpm for 30 minutes to heat soak unit and continue monitoring unit parameters
- Quickly ramp unit to 900 rpm (to simulate transient over-speed condition during a load rejection) and then immediately drop back to 650 rpm
- Monitor unit parameters again at 650 rpm for 10 minutes

- Once satisfied, ramp down and close TIV and stop unit

Step Five

Start Unit:

- Bring unit online following normal procedure (while recording and monitoring all unit parameters and with operations staff checking for noises/leaks/etc.)
- Ramp unit from 2MW upwards in 0.5 MW increments while monitoring/recording unit parameters. Ramping to follow allowable environmental ramping guidelines.
- While ramping occurs, bearing/draft tube vibration levels to be monitored
- Technicians to be alert for rough zone operation/critical frequencies/cavitation/vibration etc.
- Engineering/vibration staff to determine rough zone avoidance areas, maximum permissible output, and any other operational parameters and limitations (max vibration/temperatures/etc.)

Step Six

Trip Test:

- Ensure water flows are sufficient for trip testing
- Have all testing gear installed/ready
- Operate unit in 7-8 MW range
- Initiate unit trip that will not close TIV
- Record results to ensure correct operation of wicket gates/intensifier/PRV
- Ensure PRV ramp timing is correct and matches allowable ramping for river.

ENVIRONMENTAL PROCEDURE (as per project scope and cost estimate provided by Ecofish Research Ltd):

Testing and commissioning procedures for upgrades to G2 are estimated to take between two to four days. Ecofish staff will be on site for Steps 2, 4, 5, and 6 of the operation procedure. Steps 1 and 3 do not require significant ramping, start-up, or shutdown of either generator units, therefore monitoring is not required.

Step 2 will include shutting the plant down and then starting at least one generator. After shutting the plant down, a significant amount of work (~3 hours) is required to remove the pressure release value (PRV) plug. To monitor the shutdown, one crew of two staff will be stationed at each of the two established downstream fish stranding monitoring sites (MQM-DSSD01 and MQM-DSSD02), for four staff total. To monitor the start-up, crews monitoring the downstream sites will have time to move into the diversion reach, which requires a minimum of three hours to safely access from the road, and monitor the pre-established monitoring sites within the canyon. Step 2 is anticipated to take one day to complete.

Step 4 will require starting up and shutting down each of the two generators. Four crews of two staff (eight staff total) will monitor fish stranding at the same upstream and diversion sites as during Step 2. Given the short time anticipated between start-up and shutdown, crews will not have time to move between the upstream and diversion sites, and so will monitor the same sites throughout the day. Step 4 is anticipated to require one to two days to complete.

Steps 5 and 6 will start up both generators and complete load testing for the upgraded G2. This will require staff downstream and in the diversion to monitor fish stranding in case of sudden shutdowns during load testing and to monitor ramping generators up between load tests. A full load rejection is not anticipated, however, crews will monitor MQM-DSSD01 and MQM-DSSD02 as a contingency measure in case of emergency shutdown. Steps 5 and 6 combined are anticipated to be completed in one day with monitoring by four crews of two staff (eight staff total).

Methodology for ramping monitoring will follow the scope of work for Ecofish's September 2010 ramping tests, with staff recording stage and wetted width measurements at regular intervals and a portable pressure transducer recording stage at each monitoring site (10 second intervals).

Schedule

Step 2 is anticipated to commence between May 9 and May 16, 2011. If testing is completed when monitoring sites are at bankfull width, it may only be necessary to have crews in place for the commencement of Step 4 to determine whether or not stage change will be significant enough to dry river margins. If stranding potential is deemed to be a non-issue due to high discharge, monitoring fish stranding will not be required for the remainder of commissioning.

Procedure Administration Page
(INSERT PROCEDURE NUMBER HERE)

REVISION 0

Submitted By: Jena Tufts Date: May 3, 2011

Checked By: _____ Date: _____

Details of Change: _____

REVISION _____

Submitted By: _____ Date: _____

Checked By: _____ Date: _____

Details of Change: _____

REVISION _____

Submitted By: _____ Date: _____

Checked By: _____ Date: _____

Details of Change: _____

REVISION _____

Submitted By: _____ Date: _____

Checked By: _____ Date: _____

Details of Change: _____

REVISION _____

Submitted By: _____ Date: _____

Checked By: _____ Date: _____

Details of Change: _____

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:34 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam - Rough zone ramping May 6, 2011
Attachments: Memo to Marc Nering re May 6 2011 Ramping Rate Monitoring.pdf

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582 5227 *Fx.* (604) 582-5235

From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: Thursday, May 12, 2011 11:28 AM
To: 'Busto, Vince'; 'Knight, Francesca'; Bennett, Timothy A FLNR:EX
Cc: Marc Nering; Michael Smith; Rudy Barrett; Robert Brassard; 'fjalewis@ecofishresearch.com'; Serkan Fikirdanis
Subject: Mamquam - Rough zone ramping May 6, 2011

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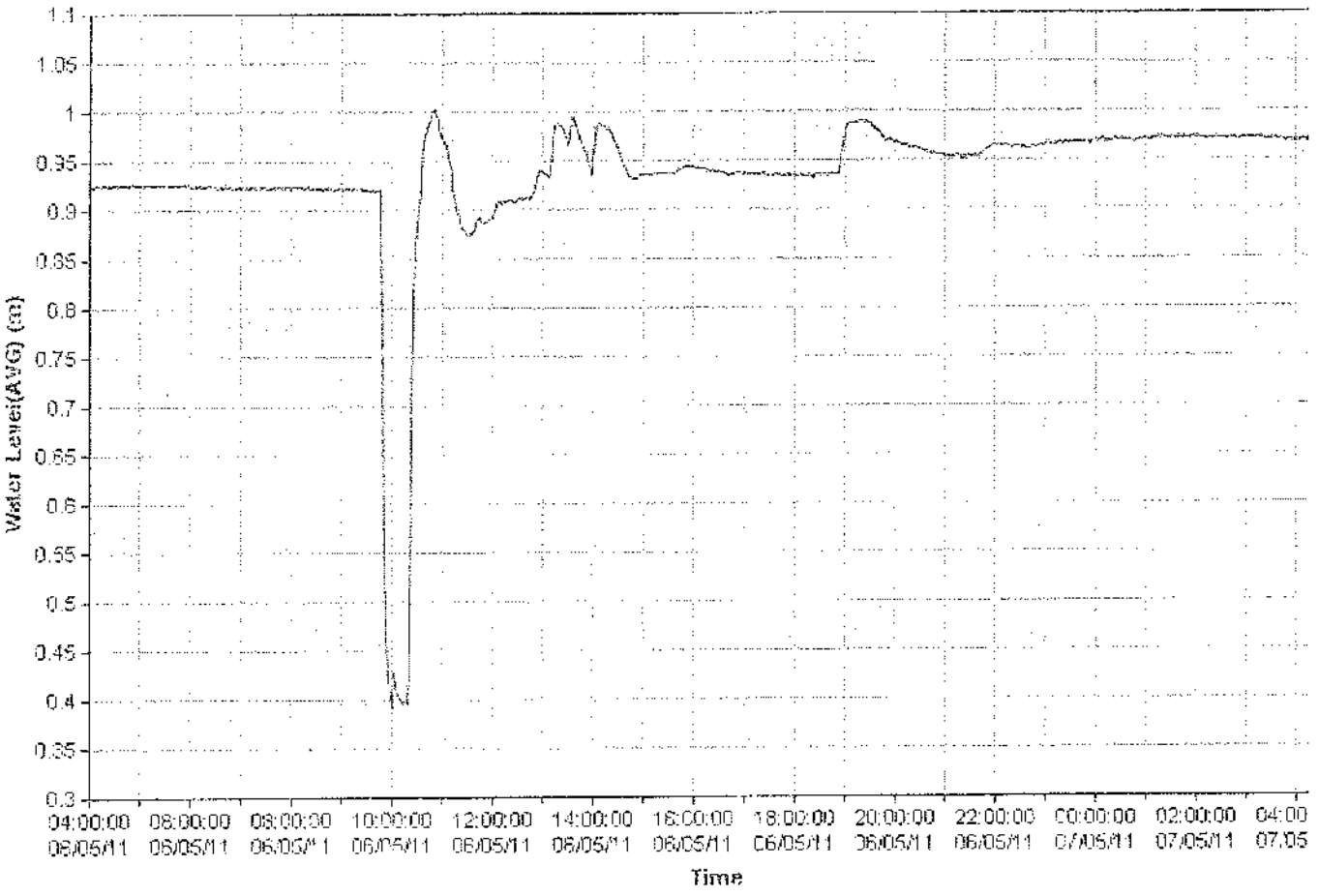


Best Regards.
Jena

Jena Tufts, M.Sc., E.I.T.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5522 | jtufts@capitalpower.com

Please consider the environment before printing this e-mail

ECOFISH RESEARCH

MEMORANDUM

TO: Marc Nering
FROM: Elyse MacDonald
DATE: May 8, 2011
FILE: 1071-04.09

RE: Mamquam River Ramping Rate Monitoring

This memo briefly describes the observations made during ramping rate monitoring conducted for Capital Power on the Mamquam River run-of-river hydroelectric project on May 6, 2011. This rough zone event was the results of operations of the Upper Mamquam River project. CPC was notified in the morning of May 6 that flow release downstream of the Upper project tailrace and thus the Lower Mamquam Proejct used their headpond to lessen the downstream impact by releasing some of the stored water. Generation at the Lower project was immediately curtailed from 28 MW to 14 MW, in an attempt to avoid rough zone ramping, however, flow was not restored upstream and the Lower project shut down generation.

Stage change was assessed based on recorded stage downstream of the powerhouse (Figure 1). Table 1, summarizes the ramping incidence based on data from the downstream hydrometric gauge (MQM-DSLG01). Three non-compliance events were recorded, with the first from 10:58 hrs until 11:34 hrs and the second from 11:54 hrs until 12:50 hrs and the third from 13:02 hrs until 13:50 hrs (Table 1 and Figure 1). During the first event was most severe with stage decrease of 23.2 cm in 36 minutes and a stage change of -23.5 cm was recorded in one hour. Stage began to rise quite quickly and so, the average stage change rate over this time would not adequately convey this event.

Crews were onsite to monitor potential fish stranding during and after the rough zone ramping event. The site downstream of the powerhouse (MQM-DSSD01) was also hand-searched between 12:00 and 12:40 hrs. A total area of 100 m^2 was sampled and two dead and two live fry were found. One dead fry appeared fresh (Figure 2) while the other appeared to be in poor condition. Both dead fry were found in approximately 5 cm depth in isolated pools and measured 30 mm and 32 mm (fork length). Two live fry were found in isolated pools, one in the same pool as the dead fry in good condition. Both were captured and returned to the mainstem.

A hand-based search was conducted at the previously established site upstream and downstream of the Highway 99 Bridge (MQM-DSSD02) between 13:30 and 14:50 hrs. An area of 200 m^2 of the stream margin and overland channel on river right was hand searched for a total of 71 minutes at this site by three people (100 m^2 upstream and 100 m^2 downstream of the bridge). No dead fish were found, but two live fish were seen in search areas upstream of the bridge. One of the two live fish was caught and recorded to be healthy and of approximately 35 mm (fork length). The second live fish appeared to be similar in size.

ECOFISH RESEARCH

Figure 1. Water levels recorded at MQM-DSLG01 during the ramping events on May 6, 2011.

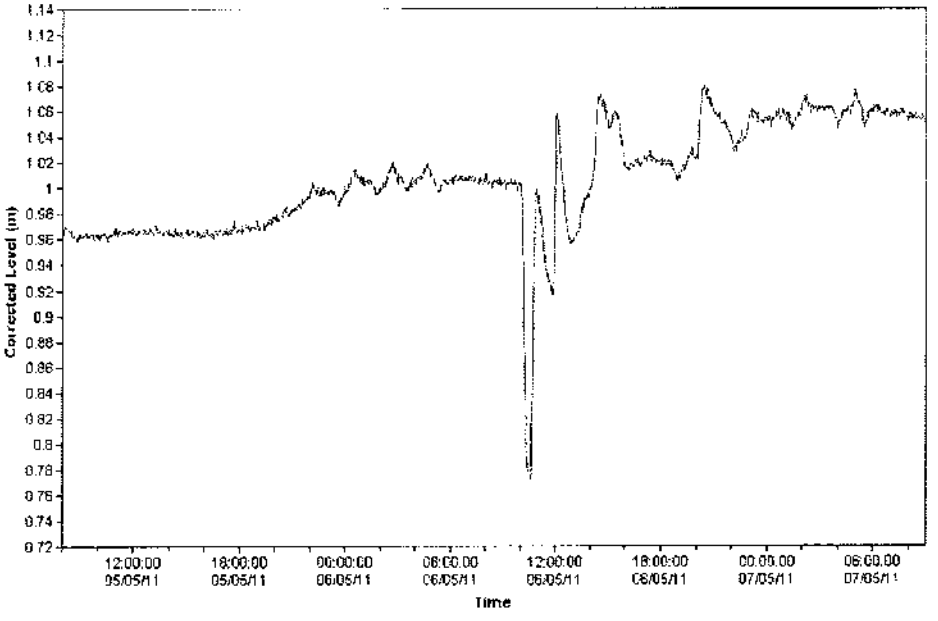


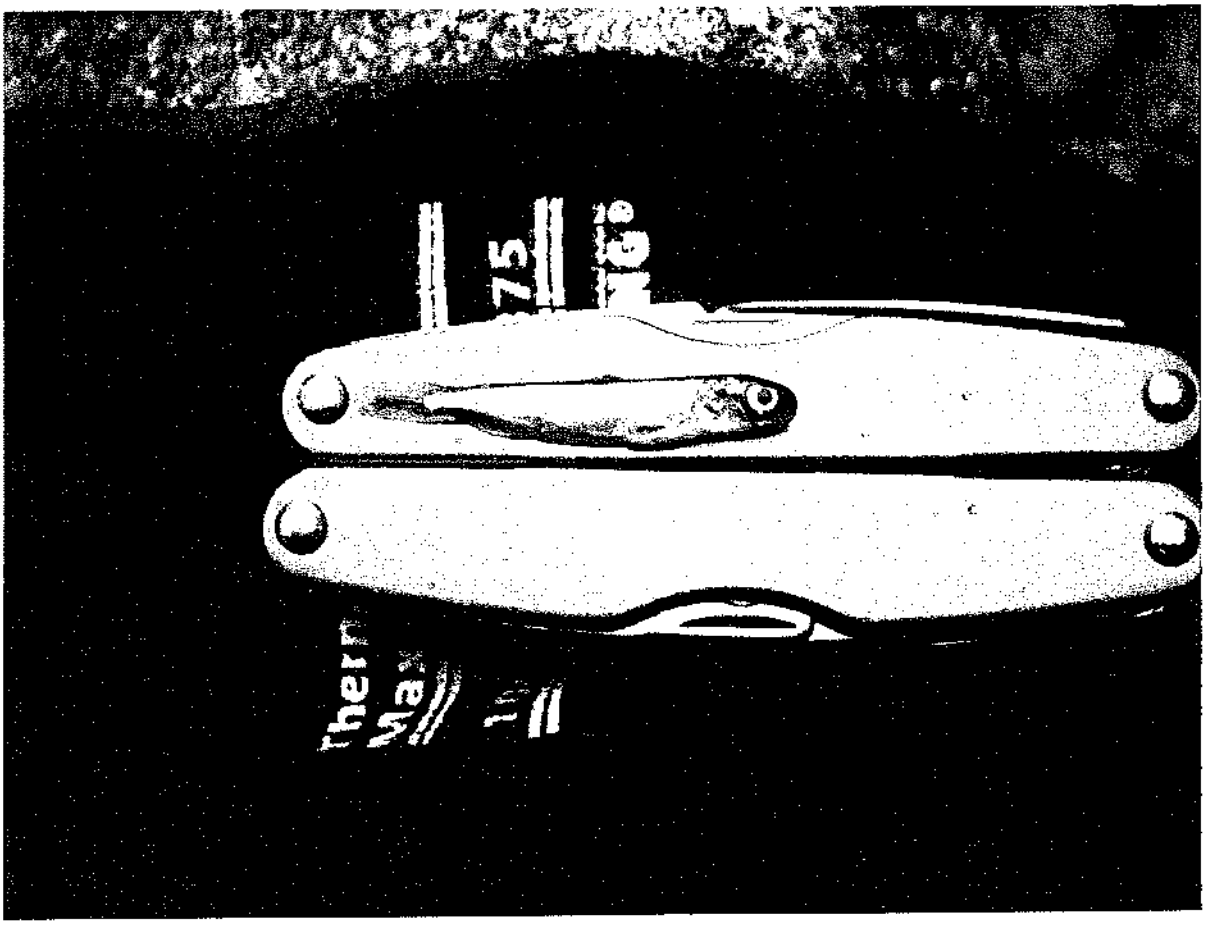
Table 1. Summary of stage change, incident duration, and rate of change on May 6 compared to ramping the rough zone ramping event on April 7, 2011.

Compliance Point	Start Time (PDT)	End Time (PDT)	Duration (Hours)	Stage Start (cm)	Stage End (cm)	Total Stage Change (cm)*	Hourly Stage Change (cm in one hour)	Non-Compliance	Discharge Start (cms)	Discharge End (cms)
MQM-DSLG01	07-Apr-11 22:34	07-Apr-11 22:56	00:22	64.7	56.8	-7.9	-7.9	Yes	6.32	4.53
MQM-DSLG01	06-May-11 10:58	06-May-11 11:34	00:36	100.3	77.1	-23.20	-23.5	Yes	18.4	9.8
MQM-DSLG01	06-May-11 11:54	06-May-11 12:50	00:56	99.9	91.6	8.3	8.3	Yes	18.3	14.8
MQM-DSLG01	06-May-11 13:02	06-May-11 13:50	00:48	105.8	95.6	-10.2	-10.2	Yes	20.9	16.4

* Negative number indicates stage decrease

ECOFISH RESEARCH

Figure 2. **Dead fry found in good condition at MQM-DSSD01.**



Yours truly,

Ecofish Research Ltd.

signed

Elyse MacDonald, M.Sc., R.P.Bio., CPESC

Environmental Biologist, Project Manager

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:34 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam - Rough zone ramping May 6, 2011

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Knight, Francesca [mailto:Francesca.Knight@dfo-mpo.gc.ca]
Sent: Thursday, May 12, 2011 3:10 PM
To: Jena Tufts; Busto, Vince; Bennett, Timothy A FLNR:EX
Cc: Marc Nering; Michael Smith; Rudy Barrett; Robert Brassard; fjalewis@ecofishresearch.com; Serkan Fikirdanis
Subject: RE: Mamquam - Rough zone ramping May 6, 2011

Hi Jena, thank you for the notification of this event. It would be helpful to know just what happened at Upper Mamquam that resulted in the flow interruption. I have tried to contact some folks at transAlta, but am not having any luck. I don't suppose yourself or Marc would have a name and number for the Upper Mamquam operator?
regards,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
Oceans, Habitat and Enhancement Branch / Direction des océans, de l'habitat et de la mise valeur
Lower Fraser River - Le Bas Fraser
Unit 3 - 100 Annacis Parkway
Delta, BC V3M 6A2
Francesca.Knight@dfo-mpo.gc.ca

Ph: (604) 666-3191 / Fax: (604) 666-6627
Squamish phone: 604-892-2040
Government of Canada - Gouvernement du Canada

Pacific Region 'Working Near Water' website
http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm

From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: May 12, 2011 11:28 AM
To: Busto, Vince; Knight, Francesca; 'Timothy.Bennett@gov.bc.ca'

Cc: Marc Nering; Michael Smith; Rudy Barrett; Robert Brassard; 'fjalewis@ecofishresearch.com'; Serkan Fikirdanis
Subject: Mamquam - Rough zone ıping May 6, 2011

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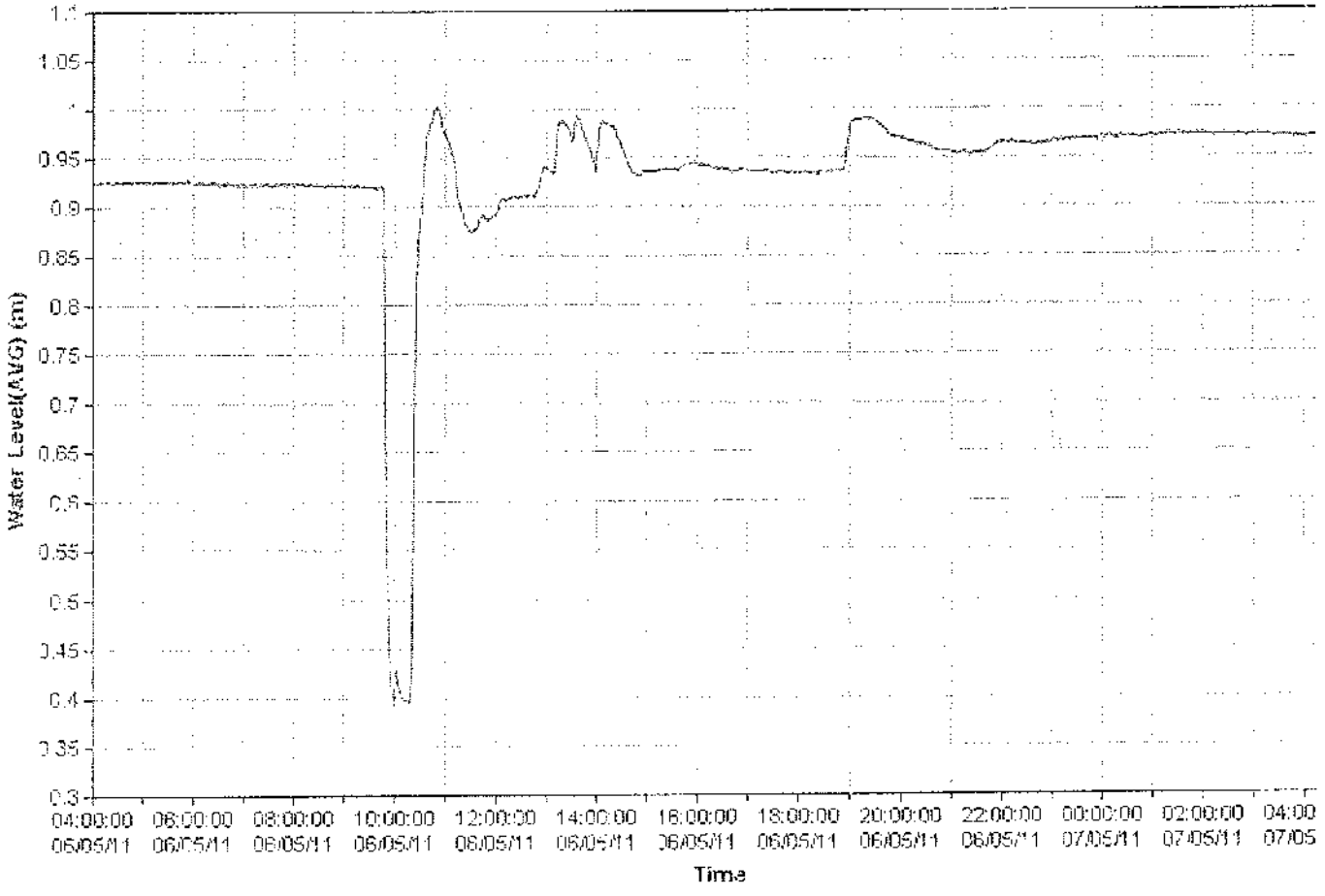

Best Regards,
Jena

Jena Tufts, M.Sc., E.I.T.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5522 | jtufts@capitalpower.com

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Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:34 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam - Rough zone ramping May 6, 2011

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Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Marc Nering [mailto:mnering@capitalpower.com]
Sent: Thursday, May 12, 2011 3:20 PM
To: Knight, Francesca; Jena Tufts; Busto, Vince; Bennett, Timothy A FLNR:EX
Cc: Michael Smith; Rudy Barrett; Robert Brassard; fjalewis@ecofishresearch.com; Serkan Fikirdanis
Subject: RE: Mamquam - Rough zone ramping May 6, 2011

Hi Francesca,

My understanding is that their plant tripped offline and the bypass did not open, cutting off the flow in the Mamquam river until their intake spill reached downstream. The only inflow into our headpond was the Raffuse Creek.

Transalta contact numbers are:

604 898 8297 plant
604 848 5194 operator cell (Randy)
604 815 9866 operator cell (Sal)

Regards,

Marc

From: Knight, Francesca [mailto:Francesca.Knight@dfo-mpo.gc.ca]
Sent: Thursday, May 12, 2011 3:10 PM
To: Jena Tufts; Busto, Vince; Timothy.Bennett@gov.bc.ca
Cc: Marc Nering; Michael Smith; Rudy Barrett; Robert Brassard; fjalewis@ecofishresearch.com; Serkan Fikirdanis
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Habitat Biologist
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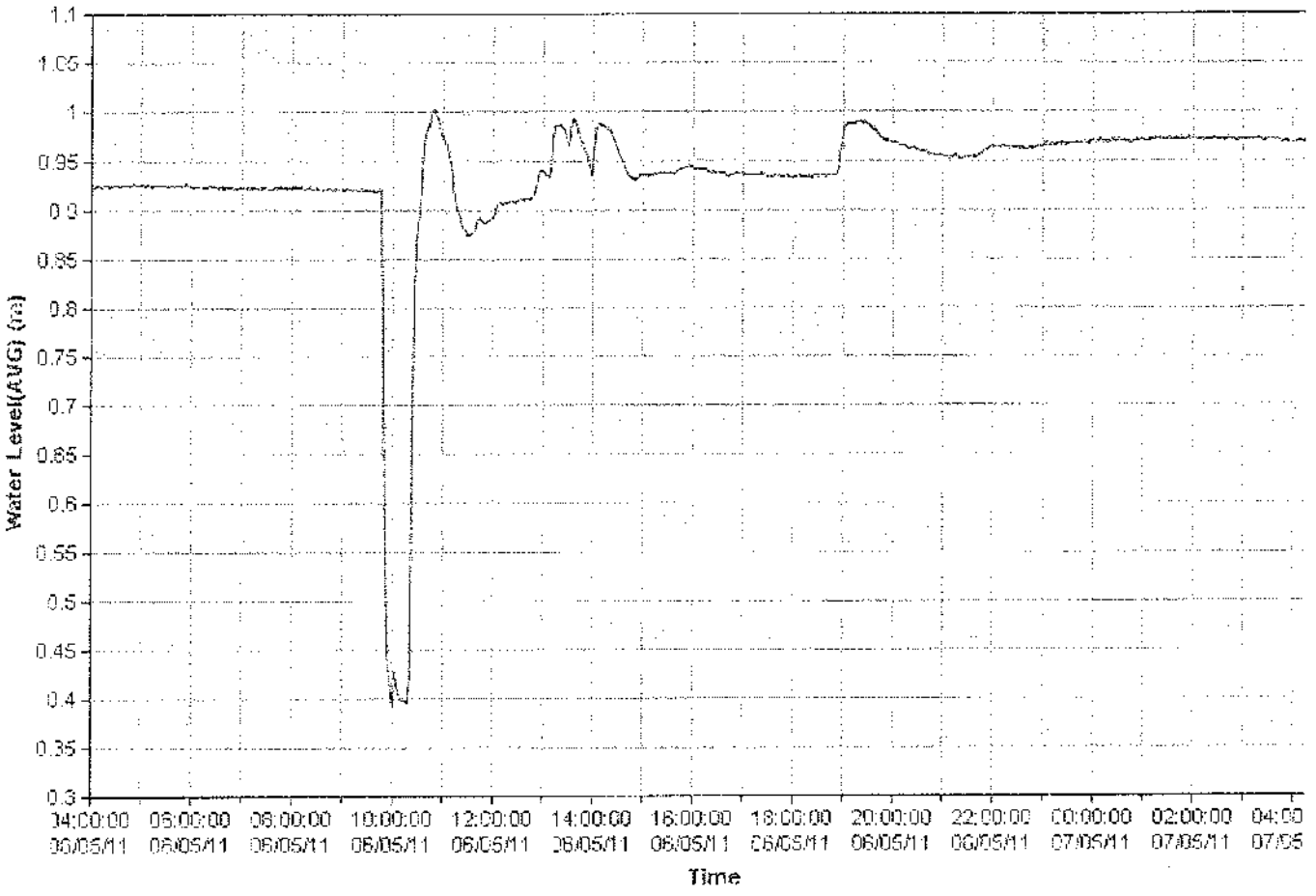

Best Regards,
Jena

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Environmental Associate
Environment, Health and Safety
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(780) 392-5522 | jtufts@capitalpower.com

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Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:33 AM
To: Becker, Judy S ENV:EX
Subject: FW: Plant trip event on May 6

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Busto, Vince [mailto:Vince.Busto@dfo-mpo.gc.ca]
Sent: Thursday, May 12, 2011 6:03 PM
To: Knight, Francesca
Cc: Bennett, Timothy A FLNR:EX; Babakaiff, Scott C FLNR:EX; Stoddard, Erin M FLNR:EX
Subject: RE: Plant trip event on May 6

Francesca

Good direction. I will call you to discuss this tomorrow.

So ... we have another 2 or three powerplants slated for this system?

Vince Busto, B.A.Sc., P.Eng.
Habitat and Hydrotechnical Engineer | Ingénieur de l'habitat et de l'hydrotechnique
Habitat and Enhancement Branch | Protection et mise en valeur des habitats
Lower Fraser River | Le bas Fraser
Fisheries and Oceans Canada | Pêches et Océans Canada
100 Annacis Parkway, Unit 3 | 100 Annacis Parkway, Unit 3
Delta, BC V3M 6A2 | Delta (C.-B.) V3M 6A2
Government of Canada | Gouvernement du Canada

Telephone/Téléphone 604-666-8281
Facsimile / Télécopieur 604-666-6627

-----Original Message-----
From: Knight, Francesca
Sent: Thu 5/12/2011 3:55 PM
To: 'Randall_Vriend@transalta.com'
Cc: 'Christine Nicholls'; 'Matt_Holder@transalta.com'; Busto, Vince
Subject: Plant trip event on May 6

Hell Randy,
Thanks for the chat this afternoon. Basically, as I understand it, the plant tripped off-line, and was off-line for about 2 hours. The bypass valve did not function properly, remaining mostly closed, for about 45 minutes. I believe shortly after the plant tripped, you started spilling from your headpond, but there would have been a lag time associated with that water making it the 2km to down below the tailrace. The plant was releasing an IFR of just under 2 cms, and the river inflows into your headpond were about 15-18 cms. It's a distance of about 700m from your tailrace down to the Lower Mamquam headpond, with [illegible]

providing input to the Mamquam about 500m downstream of your tailrace.

As we discussed on the phone, we would like to see the flow/stage data from your gauging stations (according to Summit Environmental's report, there is a gauge about 100m upstream of the powerhouse and just downstream of the tailrace). These data will help us to better understand the duration of flow interruptions.
regards,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
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Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:33 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam Bi-Weekly Update - May 17

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: Tuesday, May 17, 2011 9:45 AM
To: 'Knight, Francesca'; 'Busto, Vince'
Cc: Bennett, Timothy A FLNR:EX; Stoddard, Erin M FLNR:EX; Babakaiff, Scott C FLNR:EX; Michael Smith; Marc Nering; Rudy Barrett; Robert Brassard; 'Elyse MacDonald'; 'fjalewis@ecofishresearch.com'
Subject: Mamquam Bi-Weekly Update - May 17

Hello Francesca and Vince.

Runner installation is expected to be completed May 18 with commissioning starting soon after. There are no other updates at this time.

Below is the corrective action table to indicate the upcoming corrective actions and the items that have already been completed.

	Corrective Action	Task Owner	Target Date
1	Update manual control procedure to prevent future re-occurrence of plant ramping up through rough zone, flows not able to sustain increased generation and then ramping down through rough zone.	Marc Nering	Completed
2	CPC to provide Fisheries and Oceans and the B.C. Ministry of Environment the corrective action schedule that was developed to mitigate ramping and fish stranding concerns.	Michael Smith	Completed
3	CPC to confirm viability of reducing the rough zone ramping range from 9-16 MW to 9-15 MW.	Marc Nering	Completed
4	CPC to provide a professional biologist's opinion regarding monitoring in the diversion reach.	Jena Tufts	Completed
5	A new runner on Unit 2 turbine is currently being installed. This new runner will reduce the rough zone avoidance range that is currently causing high vibrations that are detrimental to the turbine.	Marc Nering	Expected to be completed May 18, 2011
6	Vibration testing of new runner to determine new rough zone avoidance range.	Marc Nering	31-May-11

7	During commissioning of unit 2, determine and provide the relationship between rou_ zone ramping, vibrations and flow monitoring.	Marc Nering	15-Jun-11
8	Six new flow/level sensors, 3 below intake to measure spill and 3 below the powerhouse to measure total river flow, will be installed.	Marc Nering	Completed
9	Cable will be installed to directly connect the river flow gauges to the PLC programming.	Marc Nering	Completed
10	PLC programming will be updated to include the live data from the river level gauges.	Marc Nering	30-Jun-11
11	CPC to notify Fisheries and Oceans and the Ministry of Environment of any subsequent rough zone ramping events that occur until the corrective actions have been fully implemented.	Marc Nering	As Required
12	CPC to provide bi-weekly updates on the progress and challenges occurring at Mamquam.	Jena Tufts	Ongoing

Please don't hesitate to contact me if you have any questions. However, please note that I will be away from the office later today until May 19.

Best Regards,
Jena

Jena Tufts, M.Sc., E.I.T.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5522 | jtufts@capitalpower.com


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Ha, Diana ENV:EX

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Sent: Tuesday, September 27, 2011 11:33 AM
To: Becker, Judy S ENV:EX
Subject: FW: Plant trip event on May 6

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Ministry of Forests, Lands and Natural Resource Operations
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Ph. (604) 582-5227 Fx. (604) 582-5235

From: Knight, Francesca [mailto:Francesca.Knight@dfo-mpo.gc.ca]
Sent: Tuesday, May 31, 2011 8:11 AM
To: Matthew Holder; Randall_Vriend@transalta.com; Glenn Isaac
Cc: Busto, Vince; Babakaiff, Scott C FLNR:EX; Stoddard, Erin M FLNR:EX; Bennett, Timothy A FLNR:EX
Subject: RE: Plant trip event on May 6

Hello gentlemen,
I am writing to follow up on this information request for flow and stage data from the May 6, 2011 flow interruption event.
regards,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
Oceans, Habitat and Enhancement Branch / Direction des océans, de l'habitat et de la mise valeur
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Francesca.Knight@dfo-mpo.gc.ca

Ph: (604) 666-3191 / Fax: (604) 666-6627
Squamish phone: 604-892-2040
Government of Canada - Gouvernement du Canada

Pacific Region 'Working Near Water' website
http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm

From: Knight, Francesca
Sent: May 13, 2011 8:31 AM
To: 'Matthew Holder'

Cc: Glenn Isaac
Subject: RE: Plant trip event on M 6

thanks Matt and Glenn,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
Oceans, Habitat and Enhancement Branch / Direction des océans, de l'habitat et de la mise valeur
Lower Fraser River - Le Bas Fraser
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Pacific Region 'Working Near Water' website
http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm

From: Matthew Holder [mailto:Matthew_Holder@transalta.com]
Sent: May 13, 2011 7:12 AM
To: Knight, Francesca
Cc: Glenn Isaac
Subject: RE: Plant trip event on May 6

Hi Francesca:

Thank you for your voicemails and emails. Unfortunately, I was traveling yesterday afternoon and was not able to respond until this morning. I have passed on your messages to my colleague, Glenn Isaac, who will be working with our Hydro Operations staff to address your questions and concerns.

Matt

Matt Holder . Manager, Environment . TransAlta Corporation . 110-12th Ave SW, Calgary, AB T2P 2M1 . 403-267-7495 (o) . 403-870-7615 (c) . 403-267-2005 (f) . matt_holder@transalta.com

---

From: Knight, Francesca [mailto:Francesca.Knight@dfo-mpo.gc.ca]
Sent: Thursday, May 12, 2011 4:55 PM
To: Randall Vriend
Cc: Christine Nicholls; Matthew Holder; Busto, Vince
Subject: Plant trip event on May 6

Hell Randy,
Thanks for the chat this afternoon. Basically, as I understand it, the plant tripped off-line, and was off-line for about 2 hours. The bypass valve did not function properly, remaining mostly closed, for about 45 minutes. I believe shortly after the plant tripped, you started spilling from your headpond, but there would have been a lag time associated with that water making it the 2km to down below the tailrace. The plant was releasing an IFR of just under 2 cms, and the river inflows into your headpond were about 15-18 cms. It's a distance of about 700m from your tailrace down to the Lower Mamquam headpond, with Raffuse Creek providing input to the Mamquam about 500m downstream of your tailrace.

As we discussed on the phone, we would like to see the flow/stage data from your gauging stations (according to Summit Environmental's report, the[illegible]s a gauge about 100m upstream of the p[illegible]rhouse and just downstream of the tailrace). These data will help us to better understand the duration of flow interruptions.

regards,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
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http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm

Ha, Diana ENV:EX

From: Aleta Corbett [Aleta_Corbett@transalta.com]
Sent: Wednesday, June 1, 2011 12:25 PM
To: Knight, Francesca; Babakaiff, Scott C FLNR:EX
Cc: Glenn Isaac; Matthew Holder
Subject: FW: Plant trip event on May 6
Attachments: Upper Mamquam_June 1 2011.doc

Hi Francesca and Scott,

Attached is a memo summarizing the flow data for the May 6, 2011 plant trip. Please let me know if you have any questions or require further information. Thanks,

Aleta Corbett, B.Sc., P. Biol
Environmental Coordinator
110-12th Ave SW
Calgary, AB T2P 2M1
w. (403) 267-7647
c. (587) 226-0549
Toll Free: 1.800.547.3365
aleta_corbett@transalta.com

TransAlta

From: Knight, Francesca [mailto:Francesca.Knight@dfo-mpo.gc.ca]
Sent: Tuesday, May 31, 2011 9:11 AM
To: Matthew Holder; Randall Vriend; Glenn Isaac
Cc: Busto, Vince; Babakaiff, Scott C FLNR:EX; Stoddard, Erin M FLNR:EX; Timothy.Bennett@gov.bc.ca
Subject: RE: Plant trip event on May 6

Hello gentlemen,
I am writing to follow up on this information request for flow and stage data from the May 6, 2011 flow interruption event.
regards,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
Oceans, Habitat and Enhancement Branch / Direction des océans, de l'habitat et de la mise valeur
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From: Knight, Francesca
Sent: May 13, 2011 8:31 AM
To: 'Matthew Holder'
Cc: Glenn Isaac
Subject: RE: Plant trip event on May 6

Thanks Matt and Glenn.
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
Oceans, Habitat and Enhancement Branch / Direction des océans, de l'habitat et de la mise valeur
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From: Matthew Holder [mailto:Matthew_Holder@transalta.com]
Sent: May 13, 2011 7:12 AM
To: Knight, Francesca
Cc: Glenn Isaac
Subject: RE: Plant trip event on May 6

Hi Francesca:

Thank you for your voicemails and emails. Unfortunately, I was traveling yesterday afternoon and was not able to respond until this morning. I have passed on your messages to my colleague, Glenn Isaac, who will be working with our Hydro Operations staff to address your questions and concerns.

Matt

Matt Holder . Manager, Environment . TransAlta Corporation . 110-12th Ave SW, Calgary, AB T2P 2M1 . 403-267-7495 (o) . 403-870-7615 (c) . 403-267-2005 (f) . matt_holder@transalta.com

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From: Knight, Francesca [mailto:Francesca.Knight@dfo-mpo.gc.ca]
Sent: Thursday, May 12, 2011 4:55 PM
To: Randall Vriend
Cc: Christine Nicholls; Matthew Holder; Busto, Vince
Subject: Plant trip event on May 6

Hell Randy,
Thanks for the chat this afternoon. Basically, as I understand it, the plant tripped off-line, and was off-line for about 2

hours. The bypass valve did not function properly, remaining mostly closed, for about 45 minutes. I believe shortly after the plant tripped, you started s ng from your headpond, but there would ' e been a lag time associated with that water making it the 2km to down below the tailrace. The plant was releasing an IFR of just under 2 cms, and the river inflows into your headpond were about 15-18 cms. It's a distance of about 700m from your tailrace down to the Lower Mamquam headpond, with Raffuse Creek providing input to the Mamquam about 500m downstream of your tailrace.

As we discussed on the phone, we would like to see the flow/stage data from your gauging stations (according to Summit Environmental's report, there is a gauge about 100m upstream of the powerhouse and just downstream of the tailrace). These data will help us to better understand the duration of flow interruptions.

regards,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
Oceans, Habitat and Enhancement Branch / Direction des océans, de l'habitat et de la mise valeur
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Ha, Diana ENV:EX

From:	Knight, Francesca [Francesca.Knight@dfo-mpo.gc.ca]
Sent:	Thursday, May 12, 2011 3:55 PM
To:	Randall_Vriend@transalta.com
Cc:	Christine Nicholls; Matt_Holder@transalta.com; Busto, Vince
Subject:	Plant trip event on May 6

Hell Randy,
Thanks for the chat this afternoon. Basically, as I understand it, the plant tripped off-line, and was off-line for about 2 hours. The bypass valve did not function properly, remaining mostly closed, for about 45 minutes. I believe shortly after the plant tripped, you started spilling from your headpond, but there would have been a lag time associated with that water making it the 2km to down below the tailrace. The plant was releasing an IFR of just under 2 cms, and the river inflows into your headpond were about 15-18 cms. It's a distance of about 700m from your tailrace down to the Lower Mamquam headpond, with Raffuse Creek providing input to the Mamquam about 500m downstream of your tailrace.

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regards,
Francesca

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Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
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Ha, Diana ENV:EX

From: Knight, Francesca [Francesca.Knight@dfo-mpo.gc.ca]
Sent: Thursday, May 12, 2011 3:10 PM
To: Jena Tufts; Busto, Vince; Bennett, Timothy A FLNR:EX
Cc: Marc Nering; Michael Smith; Rudy Barrett; Robert Brassard; fjalewis@ecofishresearch.com; Serkan Fikirdanis
Subject: RE: Mamquam - Rough zone ramping May 6, 2011

Hi Jena, thank you for the notification of this event. It would be helpful to know just what happened at Upper Mamquam that resulted in the flow interruption. I have tried to contact some folks at transAlta, but am not having any luck. I don't suppose yourself or Marc would have a name and number for the Upper Mamquam operator?
regards,
Francesca

Francesca Knight, M.Sc., R.P.Bio.
Habitat Biologist
Fisheries and Oceans Canada / Pêches et Océans Canada
Oceans, Habitat and Enhancement Branch / Direction des océans, de l'habitat et de la mise valeur
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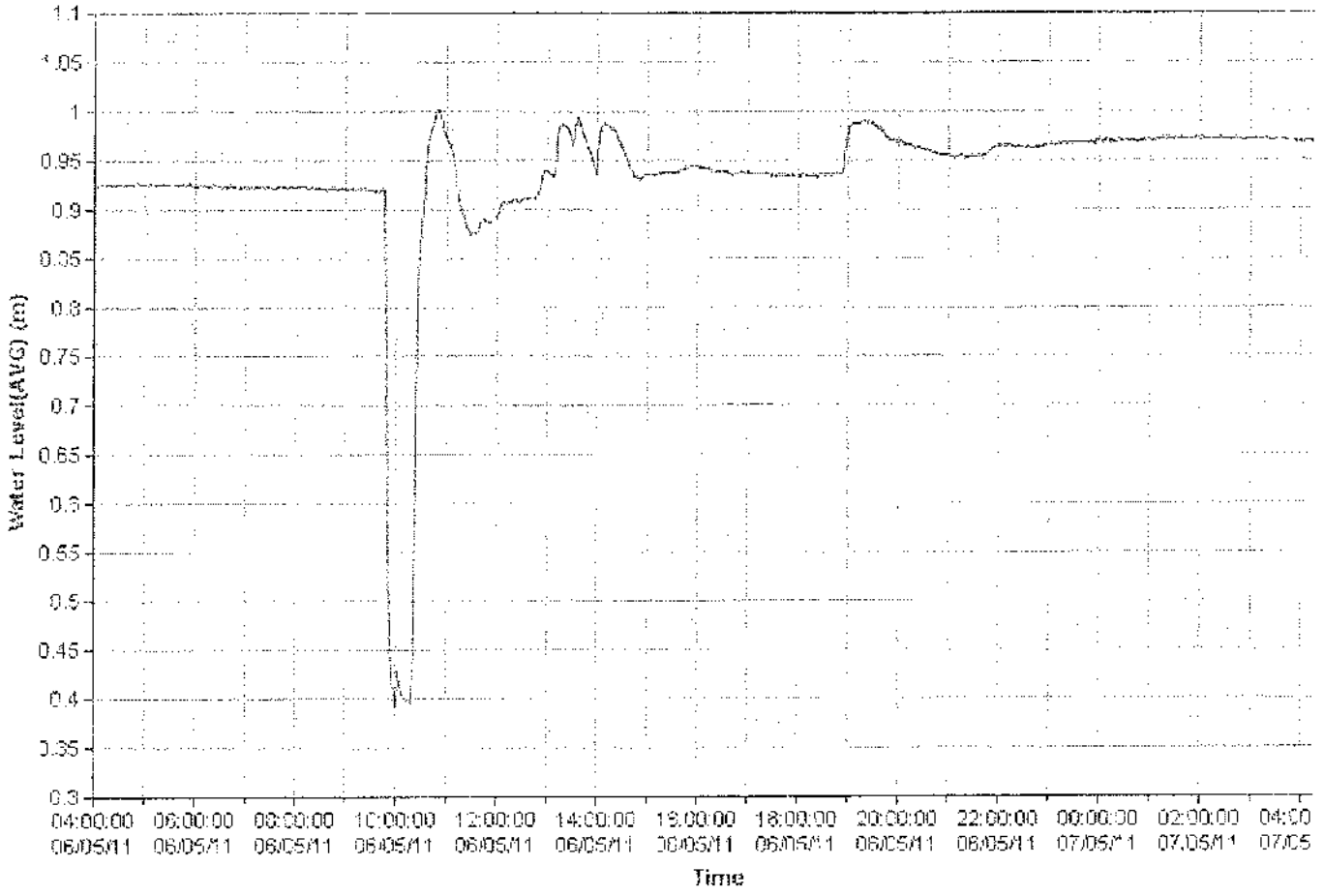
http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm

From: Jena Tufts [mailto:jtufts@capitalpower.com]
Sent: May 12, 2011 11:28 AM
To: Busto, Vince; Knight, Francesca; 'Timothy.Bennett@gov.bc.ca'
Cc: Marc Nering; Michael Smith; Rudy Barrett; Robert Brassard; 'fjalewis@ecofishresearch.com'; Serkan Fikirdanis
Subject: Mamquam - Rough zone ramping May 6, 2011

Hello Vince and Francesca,

In our April 6 meeting at Mamquam, you requested to be notified of all rough zone ramping events that occur at our Mamquam facility. On May 6, the Upper Mamquam facility informed our operations that they were having operational issues. Mamquam staff immediately observed a drop in river flows and took emergency measures to mitigate the downstream impacts of this event. Due to the operational issues at the Upper Mamquam facility, our Lower Mamquam facility was required to drop through the rough zone to match flows and avoid tripping offline due to low head pond levels. Ecofish crews were on site to monitor the rough zone ramping event and subsequently found 2 dead fry at the upstream site near the powerhouse.

Please find attached the memo prepared by Ecofish detailing this rough zone ramping event. I have also attached a graph showing the drop in river levels from the gauge upstream of Raffuse Creek.



Best Regards,
Jena

Jena Tufts, M.Sc., E.I.T.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5522 | jtufts@capitalpower.com

Please consider the environment before printing this e-mail

Ha, Diana ENV:EX

From:	Bennett, Timothy A FLNR:EX
Sent:	Tuesday, September 27, 2011 11:32 AM
To:	Becker, Judy S ENV:EX
Subject:	FW: Ramping rate concerns, Lower Mamquam hydropower project, Capital Power Corp., Squamish
Attachments:	11-176 DFO letter to Capital Power - Sept 9-2011.pdf

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Busto, Vince [mailto:Vince.Busto@dfo-mpo.gc.ca]
Sent: Friday, September 9, 2011 9:43 AM
To: Kelly Lail
Cc: Marc Nering; Barb Schmidtke; Stoddard, Erin M FLNR:EX; Bennett, Timothy A FLNR:EX; Babakaiff, Scott C FLNR:EX; Loop, Dave; Knight, Francesca
Subject: Ramping rate concerns, Lower Mamquam hydropower project, Capital Power Corp., Squamish

Mr. Lail

Please refer to the attached letter, signed by both Francesca Knight and me.

Vince Busto, B.A.Sc., P.Eng.
Habitat and Hydrotechnical Engineer | Ingénieur de l'habitat et de l'hydrotechnique
Habitat and Enhancement Branch | Protection et mise en valeur des habitats
Lower Fraser River | Le bas Fraser
Fisheries and Oceans Canada | Pêches et Océans Canada
100 Annacis Parkway, Unit 3 | 100 Annacis Parkway, Unit 3
Delta, BC V3M 6A2 | Delta (C.-B.) V3M 6A2
Government of Canada | Gouvernement du Canada

Telephone/Téléphone 604-666-9281
Facsimile / Télécopieur 604-666-6627

Pacific Region 'Working Near Water' website

http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm

<<11-176 DFO letter to Capital Power - Sept 9-2011.pdf>>

Fisheries and Oceans Canada | Pêches et Océans Canada

Unit #3 – 100 Annacis Parkway
Delta, BC V3M 6A2

September 9, 2011

Mr. Kelly Lail
Director, Commercial Management
Capital Power Corporation
PO Box 5383
Squamish, BC V8B 0C2

11-HPAC-PA2-00176

Subject: Ramping rate concerns, Lower Mamquam IPP, Squamish

Dear Mr. Lail,

DFO has been aware of impacts to fish and fish habitat as a result of plant ramping operations since the fall of 2010. Ramping events in the spring of 2011 resulted in the death of newly emerged anadromous salmonid fry, and are of great concern to DFO. As well, the recent ramping event reported on August 17, 2011 resulted in the stranding and death of salmonid fry. In total, DFO is aware of eight ramping incidents through the late summer and fall of 2010 (fish were found stranded and/or killed at half of those events, corresponding with the river low flow period following freshet), an additional five events in the spring of 2011 (affecting newly emerged fry and when the river is at low flows), and the recent August event (again, river at low flows and juvenile fish in the mainstem).

Please be advised that the stranding and / or killing of fish is in contravention of the *Fisheries Act* (S. 32). We require that Capital Power operate in such a manner that no harmful alteration, disruption or destruction (HADD) of fish or fish habitat occurs. As well, S. 22(3) of the Fisheries Act allows DFO to direct the owner or occupier of an obstruction [dam, diversion weir] as follows:

> *permit the escape into the river-bed below the obstruction of such quantity of water, at all times, as will, in the opinion of the Minister, be sufficient for the safety of fish and for the flooding of the spawning grounds to such depth as will, in the opinion of the Minister, be necessary for the safety of the ova deposited thereon.*

We direct your attention to this section of the Act particularly due to DFO's concerns pertaining to pink salmon spawning throughout the lower river and associated side channels. DFO is requesting, without at this time making a statutory order under section 22(3), that Capital Power provide an interim instream flow release (IFR) of between 7 and 10 m^3/s, from today until the flows in the river come up with the fall rains; which we would define as a discharge of $\geq$20 m^3/s that is maintained or exceeded for more than 72 hours. During this period, we request that you provide DFO with the following

Canada

hydrometric data on a daily basis: daily discharge (summarized as minimum, maximum and average) at gauges MQM-DSLG01 (downstream of the powerhouse) and MQM-DVLG-02 (lower diversion reach). We would appreciate you advising us at your earliest opportunity if you will be operating in the manner described above.

Please note that DFO Conservation & Protection staff may be investigating the above described stranding events and nothing in this letter should be taken to preclude DFO from pursuing charges for same under the Federal *Fisheries Act*.

If you have any questions please contact either of the undersigned at the contact information below.

regards,

Vince Busto, P.Eng.
Hydrotechnical Engineer
Vince.Busto@dfo-mpo.gc.ca
604-666-8281

Francesca Knight, M.Sc., R.P. Bio.
Habitat Biologist
Francesca.Knight@dfo-mpo.gc.ca
604-892-2040

cc: Marc Nering, Capital Power Corporation, Lower Mamquam Plant Operator
Barb Schmidtke, Capital Power Corporation, Environmental Associate
Tim Bennet, BC Ministry of Forests, Natural Resource Operations, Water Stewardship Division
Scott Babakaiff, BC Ministry of Forests, Natural Resource Operations, Ecosystems Division
Erin Stoddard, BC Ministry of Forests, Natural Resource Operations, Ecosystems Division
David Loop, Conservation and Protection, Squamish Field Supervisor

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:31 AM
To: Becker, Judy S ENV:EX
Subject: FW: Mamquam Ramping Event results

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Barb Schmidtke [mailto:BSCHMIDTKE@capitalpower.com]
Sent: Monday, September 12, 2011 5:06 PM
To: 'Knight, Francesca (Francesca.Knight@dfo-mpo.gc.ca)'; 'Busto, Vince (Vince.Busto@dfo-mpo.gc.ca)'; Stoddard, Erin M FLNR:EX; Babakaiff, Scott C FLNR:EX; Bennett, Timothy A FLNR:EX
Cc: Marc Nering; Michael Smith; David Hermanson; Kelly Fyhn; 'Adam Lewis (fjalewis@ecofishresearch.com)'; 'Elyse Macdonald (emacdonald@ecofishresearch.com)'
Subject: FW: Mamquam Ramping Event results

Hello all,

The Lower Mamquam hydroelectric power plant shut down for outage on September 12, 2011. During shutdown the turbines ramp down to 2 MW and then have to be shut off completely. When the turbine was shut off after ramping down to 2 MW this morning, the resulting drop in river level triggered the monitoring alarms. Ecofish crews searched the stranding hotspots and at the downstream (MQM-DSSD02), highway bridge site found one deceased fry that could have been stranded during this event. An incident report will follow.

Barb

Barb Schmidtke B.Sc.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5468 | bschmidtke@capitalpower.com


Please consider the environment before printing this e-mail

From: Elyse Macdonald [mailto:emacdonald@ecofishresearch.com]
Sent: Monday, September 12, 2011 3:29 PM
To: Marc Nering; Barb Schmidtke
Cc: Adam Lewis
Subject: Mamquam Ramping Event results

Good afternoon Marc and Barb,

Our crews searched the downstream (MQM-DSSD02), highway bridge site following the shutdown of the Lower Mamquam facility this morning. W und one stranded, deceased, fry. I am p aring an incident report this afternoon and this should be ready for agency submission later tonight or early tomorrow. The onsite crew indicated the fry is relatively fresh looking, which could indicate it was stranded due to the ramping event this morning.

Agencies should be notified that a deceased fry was found within 24hrs.

Please let me know if you have any questions.

Kind regards,

Elyse MacDonald, B.Sc., R.P.Bio., CPESC
Environmental Biologist, Project Manager

Ecofish Research Ltd.

ECOFISH RESEARCH

emacdonald@ecofishresearch.com
www.ecofishresearch.com

Suite 1000 - 355 Burrard Street, Vancouver, BC, V6C 2G8
Voice: 604 608-6180; Fax: 604 608-6163; Cell: 604 785-6726

Ha, Diana ENV:EX

From: Bennett, Timothy A FLNR:EX
Sent: Tuesday, September 27, 2011 11:31 AM
To: Becker, Judy S ENV:EX
Subject: FW: Information for Francesca Knight

Please print and file under water file 2000966.

Thanks!

Timothy Bennett, M.Sc., P.Eng.
Section Head, Water Allocation (South Coast Region)
Ministry of Forests, Lands and Natural Resource Operations
10470 - 152 Street, Surrey, BC V3R 0Y3
Ph. (604) 582-5227 *Fx.* (604) 582-5235

From: Knight, Francesca [mailto:Francesca.Knight@dfo-mpo.gc.ca]
Sent: Thursday, September 15, 2011 10:10 AM
To: Babakaiff, Scott C FLNR:EX; Bennett, Timothy A FLNR:EX; Stoddard, Erin M FLNR:EX
Subject: FW: Information for Francesca Knight

recent Mamquam flow data, including the Sept. 12 event,
C

From: Barb Schmidtke [mailto:BSCHMIDTKE@capitalpower.com]
Sent: September 14, 2011 8:38 AM
To: Knight, Francesca
Cc: Marc Nering; Kelly Fyhn
Subject: FW: Information for Francesca Knight

Hi Francesca, here is the data from Monday. I should have a table for Tuesday shortly.

Barb

From: Elyse Macdonald [mailto:emacdonald@ecofishresearch.com]
Sent: Tuesday, September 13, 2011 10:00 AM
To: Barb Schmidtke
Cc: Marc Nering; Kelly Fyhn
Subject: RE: Information for Francesca Knight

Good morning Barb,

Here is the table of information with yesterday's data added. This includes the ramping event yesterday morning, though a separate report will follow today that details our findings for this event. Based on my conversations with Elspeth yesterday, the plant is now offline until approximately Friday.

Table 1. Maximum, minimum, average and standard deviation values for discharge and stage at MQM-DSLG01 for August 29 – September 12, 2011.

Date (2011)	Standard Deviation (Discharge, cms)	Maximum Discharge (	Minimum Discharge (cms)	Average Discharge (cms)	Standard Deviation (Level, m)	ximum el (m)	Minimum Level (m)	Average Level (m)
29-Aug	1.031	24.636	20.514	21.988	0.022	1.037	0.949	0.981
30-Aug	0.767	21.935	18.795	20.192	0.017	0.981	0.909	0.941
31-Aug	0.77	19.636	16.972	18.048	0.019	0.934	0.864	0.891
01-Sep	0.596	17.489	14.729	16.114	0.016	0.877	0.804	0.841
02-Sep	0.69	15.556	13.956	14.69	0.011	0.827	0.782	0.803
03-Sep	0.394	14.573	13.276	14.011	0.011	0.808	0.763	0.783
04-Sep	0.466	15.566	13.343	14.384	0.014	0.827	0.77	0.794
05-Sep	0.539	15.715	13.749	14.765	0.015	0.831	0.776	0.805
06-Sep	0.63	15.166	13.754	14.562	0.017	0.843	0.777	0.807
07-Sep	0.534	15.602	13.243	14.445	0.015	0.838	0.77	0.796
08-Sep	0.506	15.64	13.511	14.388	0.013	0.829	0.769	0.795
09-Sep	0.973	15.166	4.169	14.273	0.03	0.843	0.367	0.783
10-Sep	0.665	14.315	13.613	14.611	0.019	0.847	0.772	0.8
11-Sep	0.755	15.242	13.715	14.667	0.021	0.848	0.775	0.805
12-Sep	0.533	15.063	12.391	13.973	0.016	0.813	0.735	0.763

Figure 1. Discharge (cms) for MQM-DSLG01 September 9 –12, 2011.

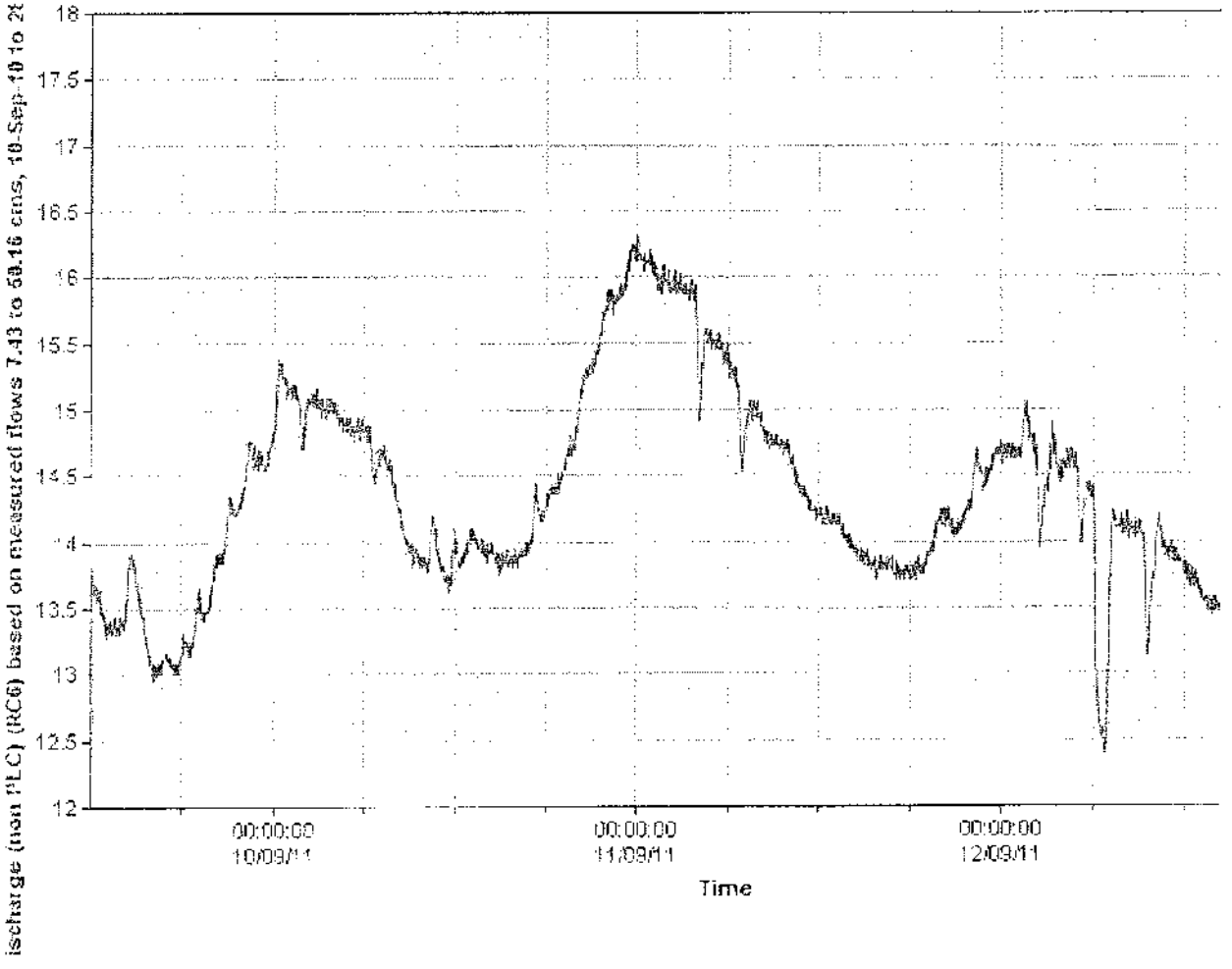
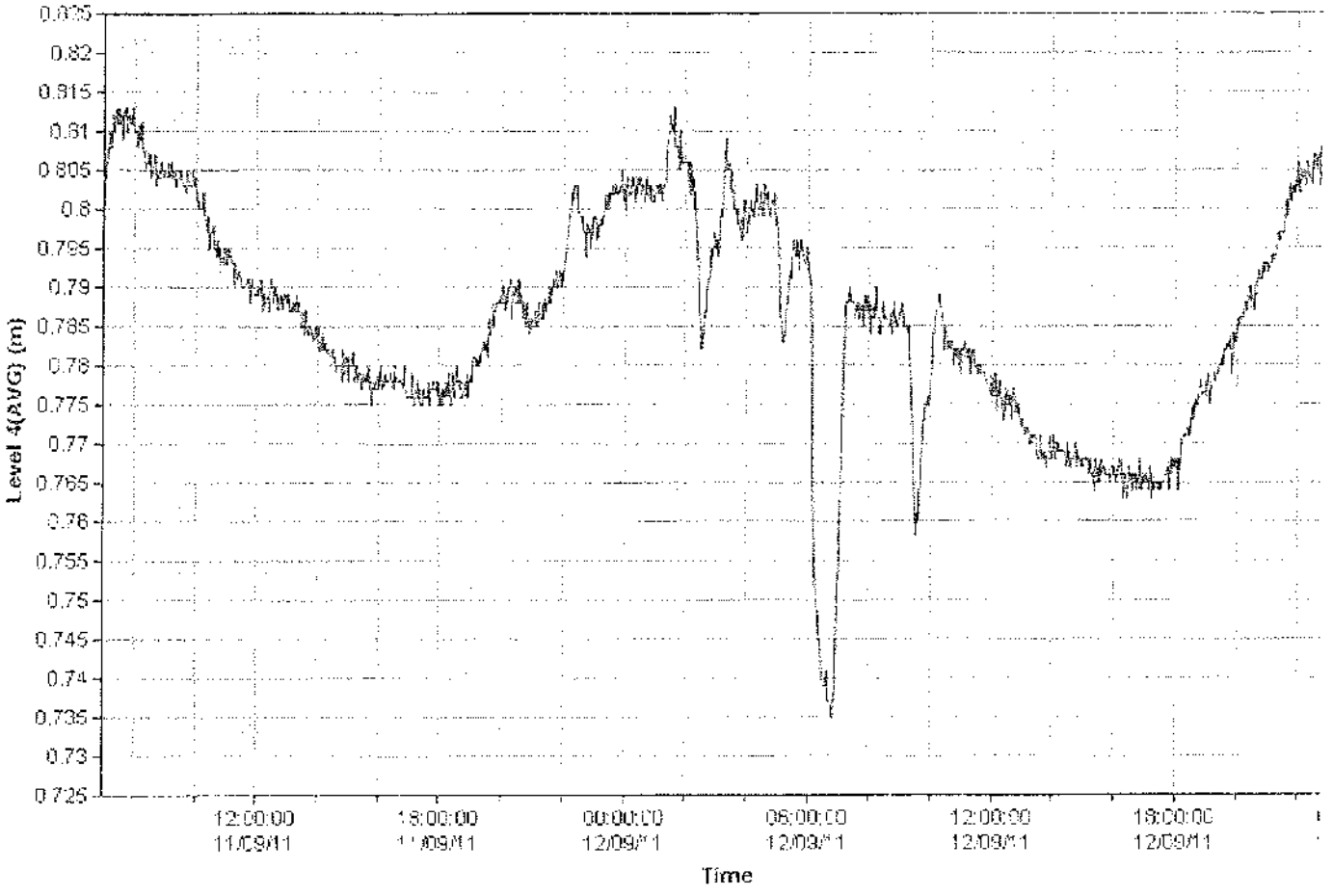


Figure 2. Level (m) for MQM-DSLG01 September 9 –12, 2011.



Please note the stage change criteria for MQM-DSLG01 is 3.6 cm/hr. Please also note all times on the graphs are PST.

Please let me know if you have any questions.

Kind regards,

Elyse MacDonald, B.Sc., R.P.Bio., CPESC
Environmental Biologist, Project Manager

Ecofish Research Ltd.

emacdonald@ecofishresearch.com
www.ecofishresearch.com

Suite 1000 - 355 Burrard Street, **Vancouver, BC**, V6C 2G8
Voice: 604 608-6180; Fax: 604 608-6163; Cell: 604 785-6726

From: Barb Schmidtke [mailto:BSCHMIDTKE@capitalpower.com]
Sent: September-07-11 4:43 PM
To: Elyse Macdonald
Cc: Marc Nering; Kelly Fyhn
Subject: Information for Francesca Knight

Hi Elyse,

Marc said to go ahead and supply the information on the max, min and average flows that Francesca asked for. You can send it to me to forward to her. I know you mentioned it doesn't take much time for you to cut and paste this information into an email, but if this is going to take a significant amount of your time over the time period she has requested- last week to at least mid- October, there should perhaps be provision for regulator information requests in the scope of the Mamquam monitoring program.

Barb

Barb Schmidtke B.Sc.
Environmental Associate
Environment, Health and Safety
Capital Power Corporation
(780) 392-5468 | bschmidtke@capitalpower.com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Capital Power Corporation

Mamquam Generating Station

Operations Procedure Insert # Here

SUBMITTED BY:	MARC NERING	DATE:	MARCH 23/2011
APPROVED BY:	MARC NERING	DATE:	March 23/2011
REVISION NO. 1		REVISED BY:	DATE REVISED:

ROUGH ZONE RAMPING WITH 1 UNIT

INTRODUCTION: This procedure is for ramping 1 unit during low river flow operation when only one unit is online.

RESPONSIBILITIES: Operations staff are required to follow this procedure

DEFINITIONS:

Rough Zone – Between 9-16MW the Mamquam units experience resonance. This causes high vibrations which are highly detrimental to the turbine.

Ramping – The process of raising or lowering unit output, and the time it takes to achieve this.

River staff gauge – The gauge in the river that operators can view to determine water level

HMI – Human Machine Interface (the unit control screen)

PROCEDURE:

Ramping upwards through rough zone

Step

1. Ensure there is adequate river flow for operation above 16MW. The minimum water level to operate above the rough zone is 0.22 meters on the river level staff gauge. The minimum water level to ramp upwards through the rough zone MUST exceed this amount. Since the water level fluctuates, take the lowest reading on the gauge. Ensure the fore bay level is above 297.1 on the operation screen and spilling (view the intake camera).
2. On the HMI, place the unit into power mode in the operating screen.
3. Enter unit power set point of 16 MW in the operating screen and press the enter key on the keyboard.
4. Enter a ramp rate of 70 in the flow ramp screen
5. The unit will start to ramp upwards through the rough zone
6. Take readings of X and Y axis turbine guide bearing vibration levels if required

7. Once the unit achieves 16MW, hold at 16 MW until flows stabilize (approx. 1 hour). Observe forebay level to ensure that it maintains a level of 297.100
8. Once flows stabilize, change Max Generation Unit XX in the Water Manager to desired Maximum output of unit (typically 26-28 MW)
9. Place the unit back into Auto mode.
10. Observe unit to ensure normal operation and operation above 16 MW

Ramping Downwards through Rough Zone

Step

1. Call Ecofish (Environmental Monitors) to let them know ramping down through the rough zone is imminent, giving as much notice as possible
2. On the HMI, place the unit into power mode on the unit operating screen
3. Enter a set point of 9 MW on the unit operating screen
4. Enter a ramp rate of 70 in the flow ramp screen
5. The unit will ramp downwards to 9 MW
6. Take readings of X and Y turbine bearing vibrations if required
7. Once the unit achieves 9 MW hold 9 MW until flows stabilize
8. Once flows stabilize, change max Generation Unit XX in Water Manager to maximum 9 MW
9. Place the unit into Auto mode
10. Observe the unit to ensure normal operation below 9 MW

Attachments:

1. River Level to MW Output Comparison Table
2. Turbine Guide Vibration Reading Chart – Rough Zone

River Level to MW Output Comparison Table

MGW	Tail Race Level (m)	River Gauge (m)
3	36.74	0.02
4	36.77	0.02
5	36.81	0.05
6	36.85	0.05
7	36.86	0.06
8	36.89	0.10
9	36.93	0.10
10	36.95	0.14
12	36.72	0.14
13	36.94	0.12
14	36.74	0.16
15	37.08	0.12
16	37.09	0.17
17	37.12	0.22
18	37.15	0.24
19	37.13	0.20
20	37.14	0.24
21	37.19	0.25
22	37.53	0.28
23	37.27	0.29
24	37.28	0.30
25	37.30	0.30
26	37.34	0.34
27	37.33	0.36
28	37.40	0.36
29	37.38	0.39
32	37.48	0.44
33	37.57	0.32
34	37.55	0.48
35	37.54	0.48
36	37.59	0.50
37	37.55	0.50
40	37.57	0.50
41	37.65	0.52
42	37.64	0.52
44	37.75	0.68
47	37.73	0.57
49	37.75	0.60
50	37.97	0.62
51	37.83	0.64
54	37.88	0.70
55	38.00	0.72
56	37.93	0.70

MQ Generator Turbine Guide Vibration Readings through the Rough Zone						
Unit #	☐↑ ☐↓	Date		Unit #	☐↑ ☐↓	Date
MGW	X	Y		MGW	X	Y
9				9		
9.5				9.5		
10				10		
10.5				10.5		
11				11		
11.5				11.5		
12				12		
12.5				12.5		
13				13		
13.5				13.5		
14				14		
14.5				14.5		
15				15		
15.5				15.5		
16				16		
16.5				16.5		
17				17		
17.5				17.5		
18				18		
18.5				18.5		
19				19		
19.5				19.5		
20				20		

Notification Record Revision 0
I have read and agree to operate in accordance with this procedure

Print Name	Signature	Date
Dave Carlin		24th MAR 2011
Dave Griffioen		Mar 24/2011
Marc Nering		March 28/2011
Wayne Moffatt		Mar 25/2011

Procedure Administration Page

(INSERT PROCEDURE NUMBER HERE)

REVISION	0		
Submitted By:	Marc Nering	Date:	March 23 2011
Checked By:		Date:	
Details of Change:			

REVISION			
Submitted By:		Date:	
Checked By:		Date:	
Details of Change:			

REVISION			
Submitted By:		Date:	
Checked By:		Date:	
Details of Change:			

REVISION			
Submitted By:		Date:	
Checked By:		Date:	
Details of Change:			

REVISION			
Submitted By:		Date:	
Checked By:		Date:	
Details of Change:			

Bennett, Timothy A ENV:EX

From: Marc Nering [mnering@capitalpower.com]
Sent: Thursday, March 24, 2011 8:45 AM
To: 'Busto, Vince'; 'Knight, Francesca'; Bennett, Timothy A ENV:EX
Cc: Rudy Barrett; Michael Smith; Jena Tufts
Subject: RE: Mamquam Rough Zone Ramping
Attachments: Memo to Marc Nering re 21-Mar-11 Ramping Rate Monitoring.pdf

Hello Vince/Francesca/Timothy,

See attached for Ecofish's report.

We have also reviewed our manual ramping procedure and have made changes to prevent this from occuring again. In addition, components have been ordered to automate this process using additional new river gauges to be installed downstream of both the intake and powerhouse. These will be wired directly into the plant PLC's (the computers that operate the plant). Due to the specialized nature of these components, there is an 8-10 week delivery on parts, with installation to occur by the end of May.

Marc Nering

Nering
y, March 22, 2011 5:32 PM
'ince; 'Knight, Francesca'; 'Timothy.Bennett@gov.bc.ca'
rrett; Michael Smith; Jena Tufts
Mamquam Rough Zone Ramping

Hello Vince/Francesca/Timothy,

Late yesterday (March 21), the Mamquam plant ramped down through the rough zone. Ecofish, our environmental monitors, were notified and performed a river survey of the likeliest fish stranding areas. They verbally confirmed today that they found 14 salmon fry stranded most likely as a result of plant ramping. I haven't received their report yet regarding species/size/etc., but once I receive the report I will forward it to you.

Capital Power is also reviewing the plant's operations, as this is the first time we have stranded this many fish.

Also, the Mamquam plant Unit 2 overhaul will be completed soon (mid April). This unit will have a redesigned turbine runner, which is expected to have a much smaller rough zone of operation, and will hopefully eliminate the rough zone ramping we now experience. This unit will become the designated unit for low flow operation once commissioned to avoid future fish strandings.

Marc Nering
Operations Manager
Mamquam Powerplant

ECOFISH RESEARCH

MEMORANDUM

TO: Marc Nering
FROM: Elyse MacDonald
DATE: March 22, 2011
FILE: 1071-04.09

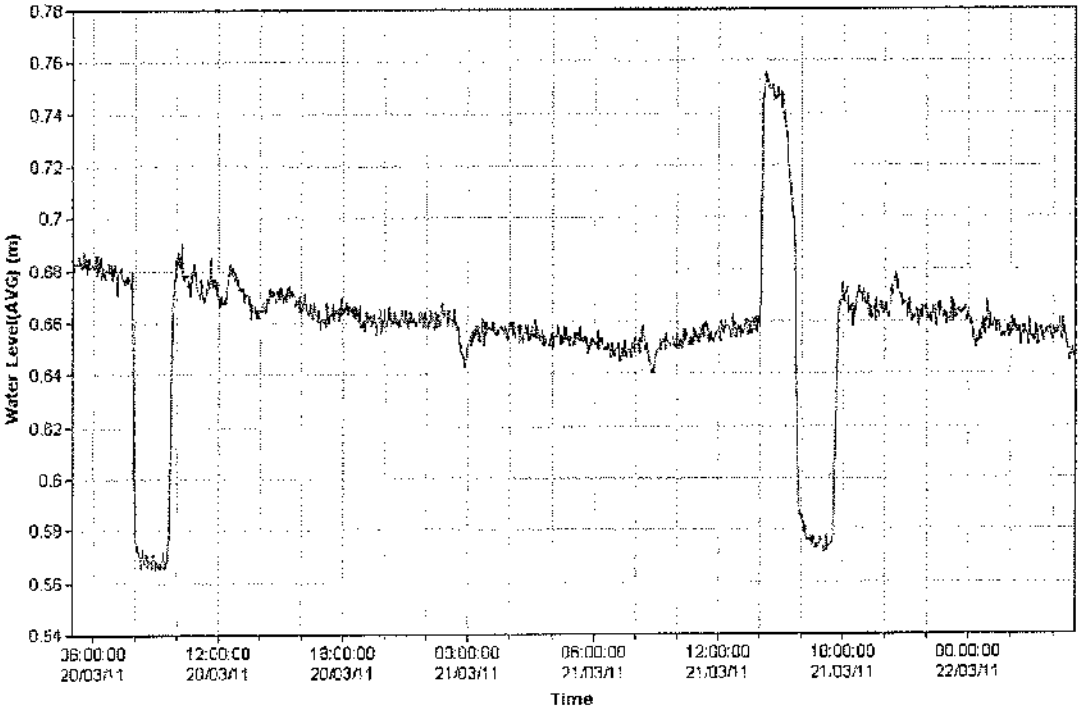
RE: Mamquam River Ramping Rate Monitoring

This memo describes the observations made during ramping rate monitoring conducted for Capital Power on the Mamquam River run-of-river hydroelectric project. Ramping up through the rough zone occurred at 14:00 hrs on March 21, 2011. Flows did not permit the plant to sustain operations at 16 MW and thus a subsequent ramp back down through the rough zone occurred at 15:24 hrs. The combination of two rough zone events had a compounding effect on stage change downstream of the powerhouse.

Crews arrived at MQM-DSSD02~5.1 km downstream of the tailrace at 17:45 hrs, when water levels were at the lowest point during the ramping event. Broad based and 'hot spot' searches were conducted at this location between 18:00 and 19:00 hrs.

The downstream, permanent gauge (MQM-DSLG01) recorded the events (Figure 1).

Figure 1. Stage data from permanent gauge (MQM-DSLG01) during the March 20 and 21 rough zone ramping events.



Based on Figure 1, crews were likely onsite at MQM-DSSD02 during the low flow pulse, as the lag time from the powerhouse to this site is less than 1 hour.

Table 1 summarizes the stage change and rate of change observed at the monitoring sites and the permanent gauge during the rough zone ramping event on March 21. These rates are compared to those calculated for the rough zone event on February 10, 2001 when a stranded fish was observed at MQM-DSSD01.

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Table 1. **Summary of stage change, incident duration, and rate of change during ramping on March 21 and February 10, 2011.**

Logger Location	Date, Incident Start Time (hrs)	Date, Incident End Time (hrs)	Stage Start (m)	Stage End (m)	Total Stage Change (m)*	Duration of Stage Change (hr)	Rate of Stage Change (m/hr)*
MQM-DSLG01	Feb-10 16:12	Feb-10 16:50	0.667	0.559	-0.108	0.633	-0.171
MQM-DSLG01	Mar-21 14:00	Mar-21 14:16	0.658	0.756	0.098	0.267	0.368
MQM-DSLG01	Mar-21 15:24	Mar-21 16:14	0.715	0.576	-0.139	0.833	-0.167

* negative numbers indicate stage decrease

Water temperature was approximately 3.4 °C in the Mamquam River in the afternoon on March 21. Stranded salmonid fish, identified to be a chum and chinook, were observed in a de-watered area on top of cobble at MQM-DSSD02 (Figure 2). The 17 dead fry were found in close proximity to a stranded coho or Chinook on February 18, 2011. One isolated fry was found alive.

Figure 2. **Stranded salmonid fish found at MQM-DSSD02.**

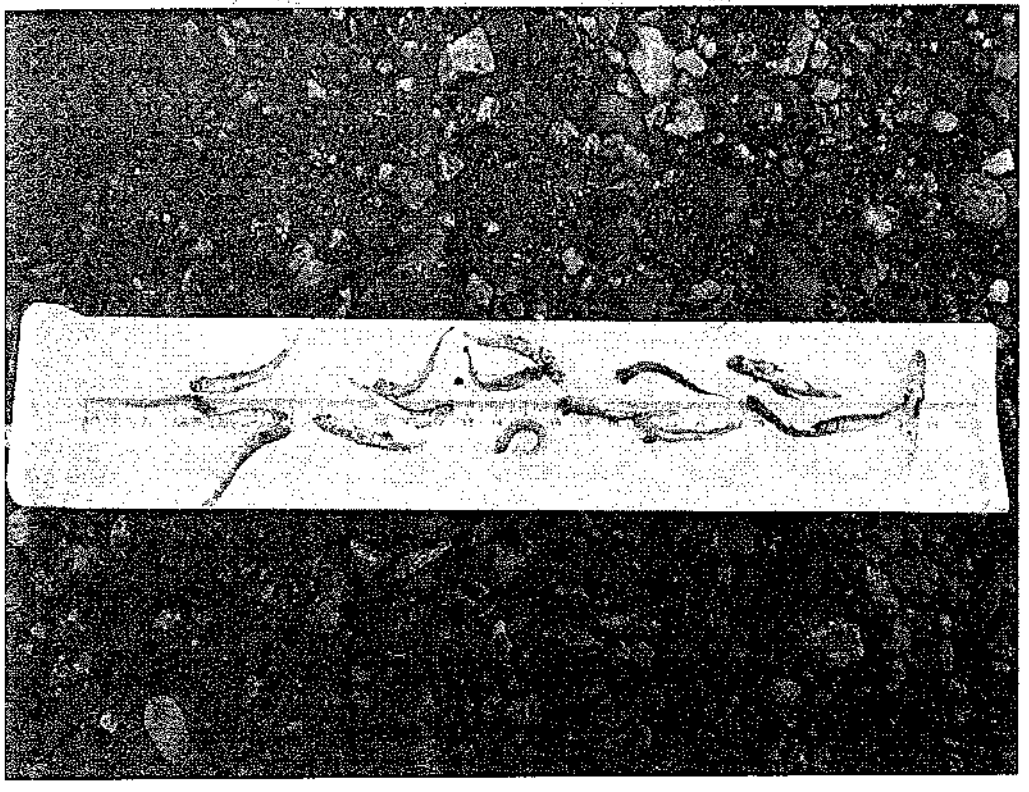


Figure 3. Proximity of the stranded fish to the dewatered overland channel (green arrows) and Mamquam River (red arrow).

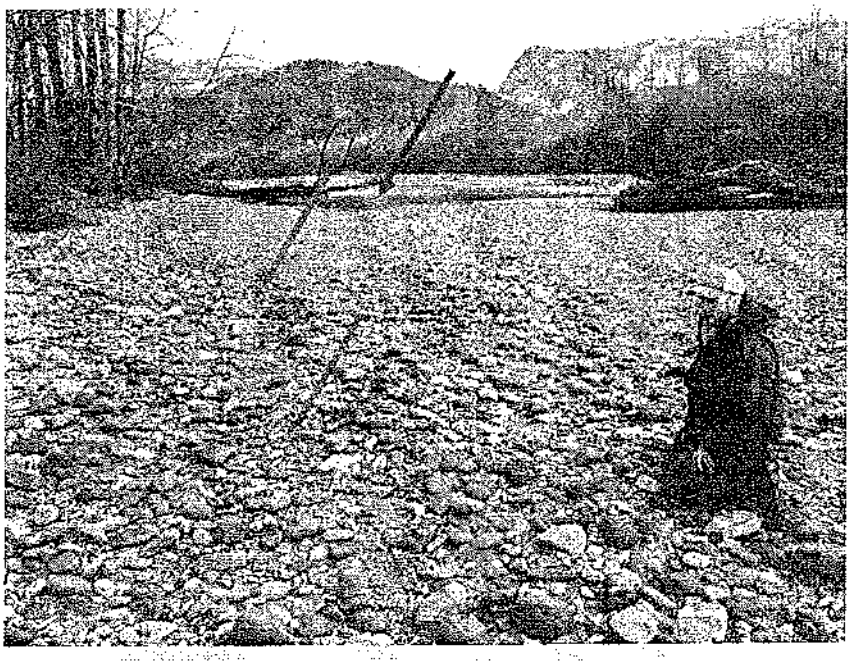
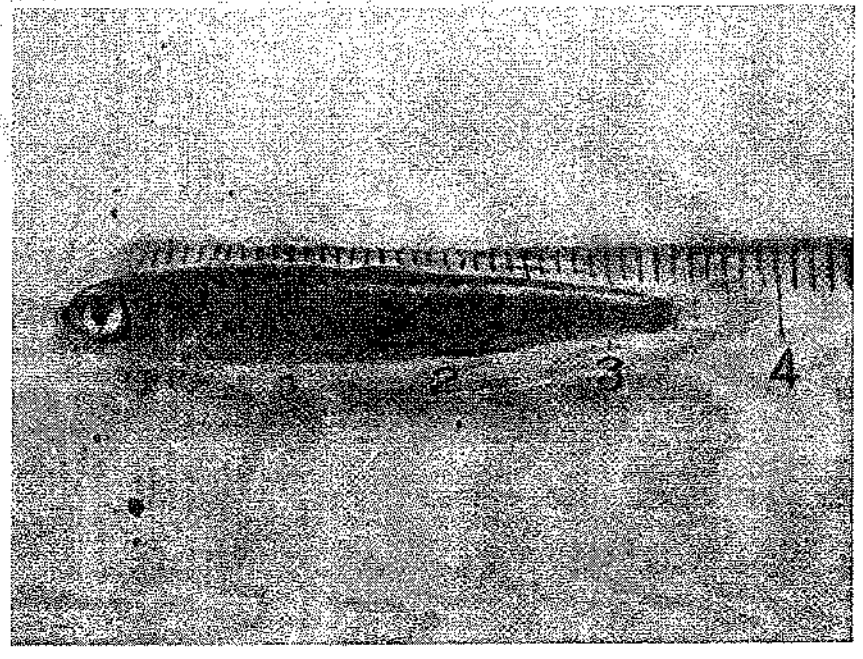


Figure 4. Isolated salmonids found alive.



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The fry were found on top of cobble and displayed a 'kinked' appearance, indicating they were available to predation but not fresh mortalities. It is likely the fry died more than an hour prior to discovery, but not more than a day prior. These fry may have been killed during the March 20 ramping event but not identified during searches on the morning of March 20. It is unlikely the fry died prior to that time as significant decay or predation markings were not observed.

We recommend that Ministry of Environment and Ministry of Natural Resource Operations as well as Fisheries and Oceans Canada be notified of this stranding event within 24hrs.

Yours truly,

Ecofish Research Ltd.

signed

Elyse MacDonald, B.Sc., R.P.Bio., CPESC

Project Manager, Environmental Biologist

ECOFISH RESEARCH

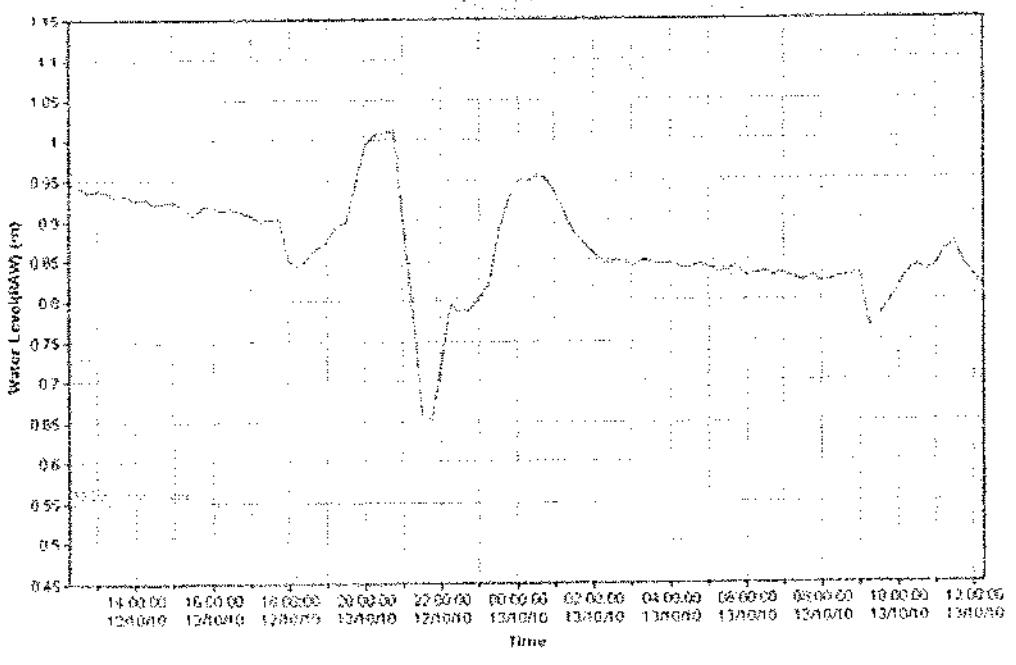
MEMORANDUM

TO: Marc Nering
FROM: Adam Lewis
DATE: November 21, 2010
FILE: 1071-04.04

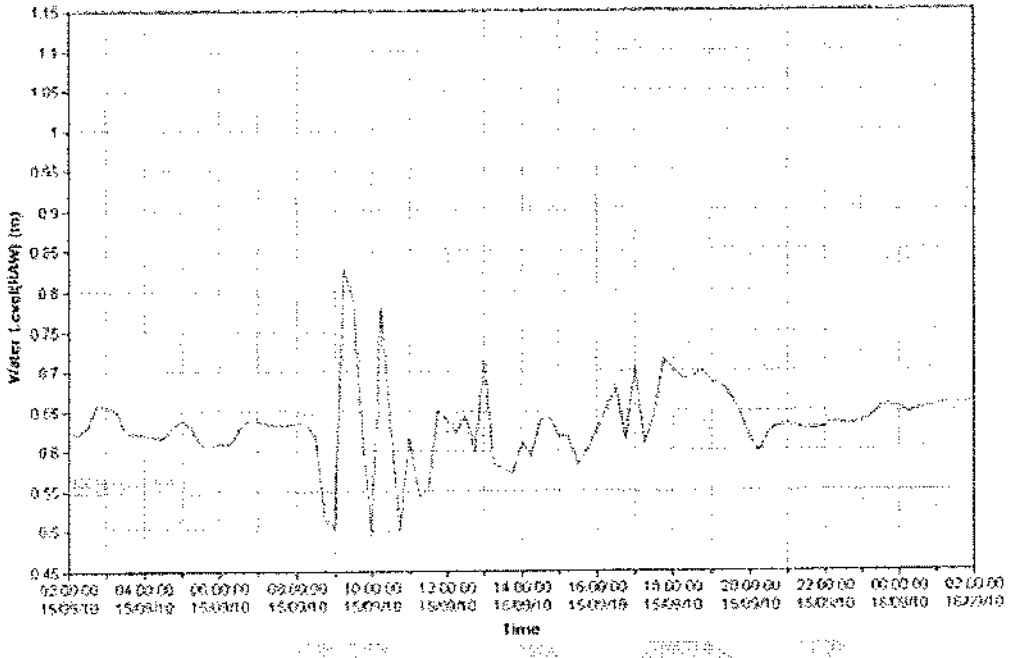
RE: Mamquam River Ramping Rate Monitoring

This memo briefly describes the observations made during ramping rate monitoring conducted for Capital Power on the Mamquam River run-of-river hydroelectric project. Ramping through the rough zone began just before 20:45 (all times PDT) October 12 and lasted until ~02:00 on October 13. There were no crews onsite to monitor stage change or fish stranding, however, crews arrived at approximately 09:00 October 13 to search for stranded fish.

Stage change was assessed on October 13 based on recorded stage downstream of the powerhouse. The largest decline occurred between approximately 20:45 – 21:30 and was 0.356 m (1.012 m to 0.656 m):



Discharge was similar to that during the September 15 incident, when fish were stranded. The following graph is the incident recorded September 15, when stranding occurred at the lowest stage at approximately 09:00 and 10:00.



The magnitude of the decline ending at approximately 09:00 was 0.129 m in 0.75 hr (0.634 m to 0.505 m) and 4 isolated fry were observed. The second decline, ending at approximately 10:00, was 0.330 m in approximately 0.75 hr (0.826 m to 0.496 m), which resulted in 1 isolated and 1 stranded fry.

Table 1, below summarizes this information.

Table 1. Summary of stage change, incident duration, and rate of change on September 15 and October 13

Date, Incident End Time	Stage Start	Stage End	Total Stage Change	Duration of Stage Change	Rate of Stage Change (cm/hr)
Sept. 15, 09:00	0.634	0.505	-0.129	0.750	-0.172
Sept. 15, 10:00	0.826	0.496	-0.330	0.750	-0.440
Oct. 13, 02:00	1.012	0.656	-0.356	1.250	-0.285

The rate of change of the October 13 incident is similar to the September 15 incident, though end stage is higher.

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Beginning at approximately 09:00 October 13, crews searched downstream the monitoring sites where fish were observed stranded on September 15. Fry were likely present during the October 12 incident, as fry were confirmed upstream of the powerhouse during fish inventory work conducted October 21 – 23. No stranded fish were observed on October 13, though it is possible they were washed downstream when stage returned to near pre-incident levels.

Yours truly,

Ecofish Research Ltd.

signed

Adam Lewis, M.Sc. R.P.Bio.

Principal, Senior Biologist

ECOFISH RESEARCH

MEMORANDUM

TO: Serkan Fikirdanis
FROM: Elyse MacDonald
DATE: December 10, 2010
FILE: 1071-04

RE: Contingency Plan for Rough Zone Ramping– Lower Mamquam: DRAFT

Purpose

The purpose of this Contingency Plan for Rough Zone Ramping is to outline the methodology for response and monitoring during rough zone ramping at the Lower Mamquam Hydroelectric Project. Rough zone ramping, at this time, must occur and the purpose of monitoring is to salvage fish, if stranded, or confirm whether or not fish were stranded.

Scope

This Contingency Plan applies to all Capital Power Corporation (CPC) operators and employees who are responsible in any way for ramping events during the rough zone or who are responding to these events. Rough zone ramping occurs between 9 MW (~6.4 cms) and 16 MW (~9.3 cms). Within this range, the project cannot operate due to mechanical issues. For this reason, when flows are high enough, the generators are moved from generating 9 MW to 16 MW as quickly as possible, within approximately 15 min. Likewise, when flows are not sufficient to produce 16 MW and maintain IFR, the generators are ramped down as quickly as possible from 16 MW to 9 MW, again within approximately 15min. In this case ramping to protect fish health is not possible.

Responsibilities

Plant Operator/Project Manager

- Check the discharge in Mamquam Creek regularly, more frequently as the rough zone discharge levels approach.
- Notify Ecofish Research Ltd. (ERL) staff no less than 2 hrs prior to ramp down through the rough zone, and 5 hrs prior to ramp up through the rough zone.
- Report any fish stranding or fish kill to Fisheries and Oceans Canada (DFO) and BC Ministry of Environment (MOE).

ERL

- Revisions to this procedure may occur based on equipment upgrades or agency comments.
- Must be available to be onsite within 2 hrs to monitor rough zone ramp down.
- Must be available to be onsite within 5 hrs to monitor rough zone ramp up; provided conditions to access the diversion reach are safe (no significant snow/ice).
- Obtain fish salvage permits annually
- Immediately report any fish stranding or kill to CPC.
- Provide CPC with written results within 1 week of each event.

The notification procedure (flow chart) outlining the response and reporting requirements is included in Figure 1.

Procedure – Background

The Lower Mamquam River is accessible to anadromous salmon species in the downstream reach and in the lowermost 100 m of the diversion reach. Upstream of this point only resident species are present (rainbow trout and Dolly Varden). Two downstream monitoring sites have been established and two potential sites have been identified in the diversion at electrofishing sites. All sites are located in natural stream habitats that represent areas that are most sensitive to stranding.

Downstream Sites (Anadromous Habitat)

MQM-DSSD01 (kayak park): This site is located approximately 585 m downstream of the tailrace (i.e. approximately 140 m downstream of the pipeline crossing).

MQM-DSSD02 (HWY 99 bridge): This site is located approximately 5,100 m downstream of the tailrace (i.e. immediately downstream of the Highway 99 bridge crossing).

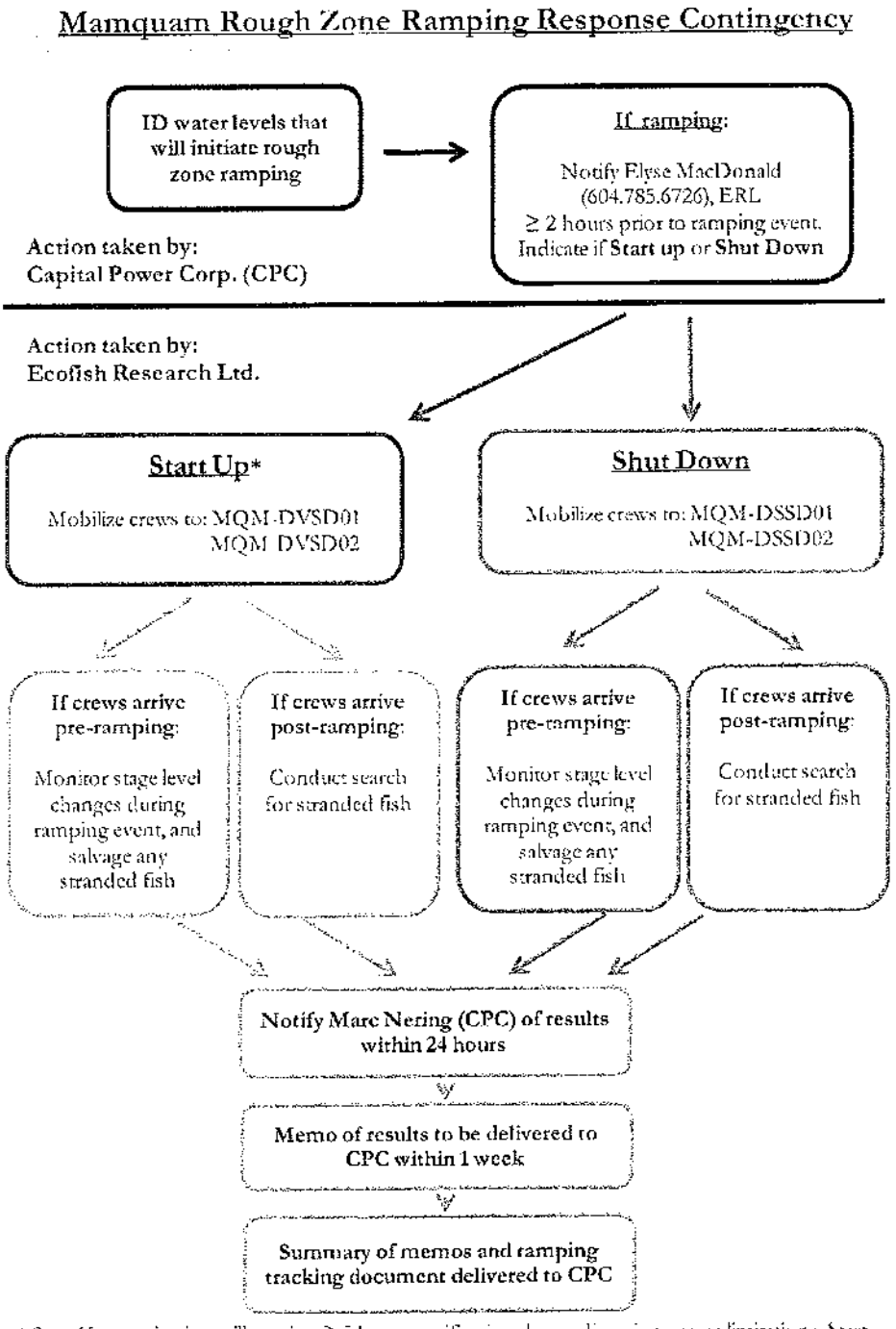
Diversion Site (Resident Habitat)

MQM-DVSD01 – This site is located approximately 600 m upstream of the tailrace.

MQM-DVSD02 – This site is located approximately 1,000 m upstream of the tailrace.

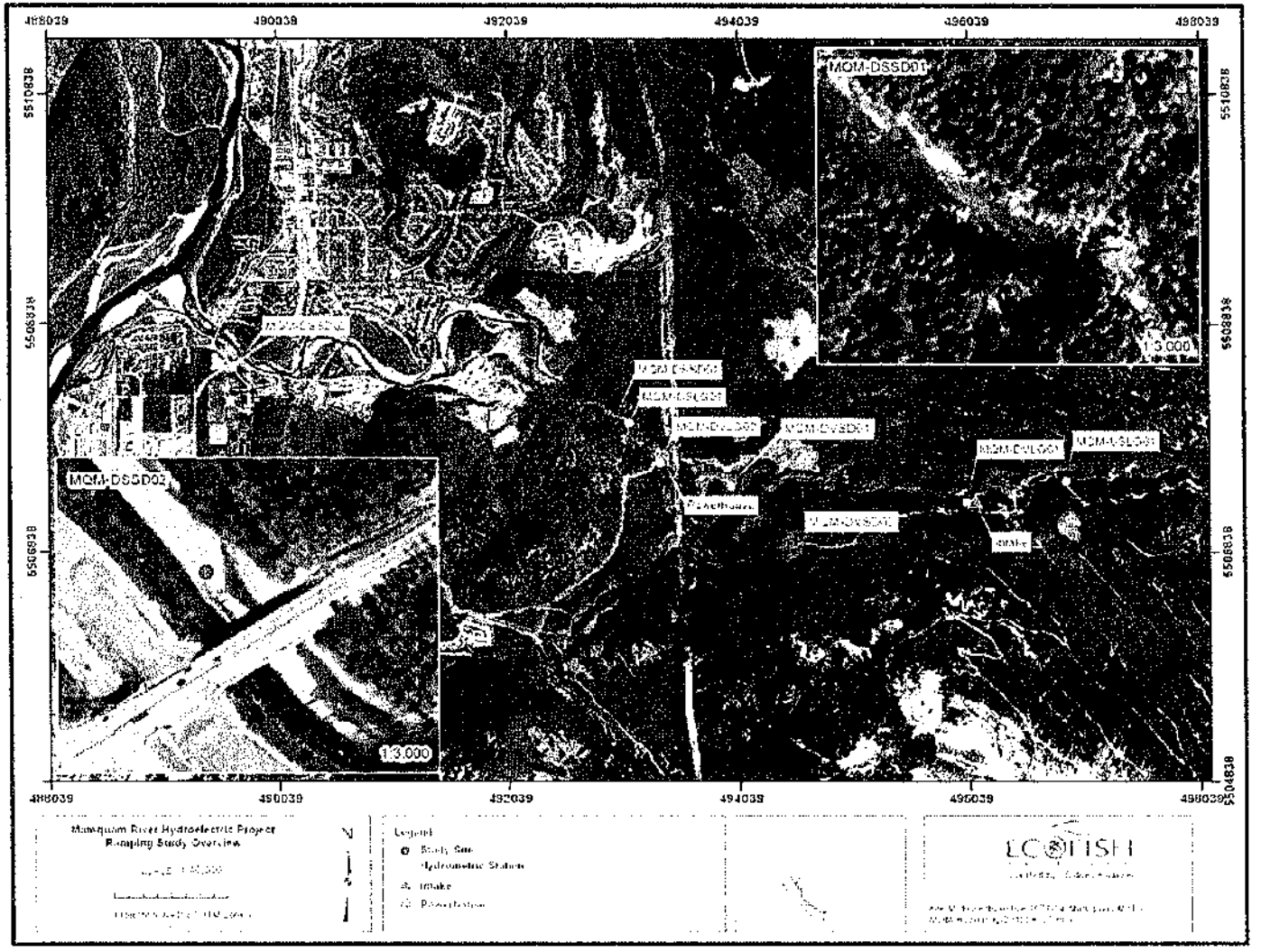
Please note that these sites are subject to change following further evaluation and additional sites may be added if deemed necessary. The locations of the ramping monitoring sites are shown on Figure 2.

Figure 1. Notification procedure (flow chart) for the contingency plan during rough zone ramping at the Lower Mamquam Hydroelectric Project.



* Start Up monitoring will require ≥ 5 hours notification due to diversion access limitations. Start up monitoring will be conducted for a pre-arranged event once snow has melted to allow for sufficient safety planning

Figure 2. Map of the lower Mamquam River hydropower project, hydrometric gauges, and the ramping monitoring sites.



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Yours truly,

Ecofish Research Ltd.

signed

Elyse MacDonald, B.Sc. R.P.Bio., CPESC

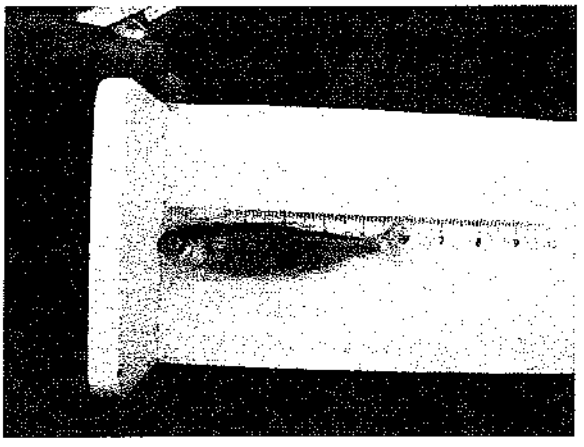
Environmental Biologist, Project Manager

Page 098 to/à Page 131

Withheld pursuant to/removed as

Copyright

Figure 21: Steelhead trout fry stranded during stage fluctuations (10:55).



ECOFISH RESEARCH

MEMORANDUM

TO: Marc Nering
FROM: Elyse MacDonald
DATE: November 23, 2010
FILE: 1088-04.04

RE: Summary of Mamquam rough zone ramping status

This memo summarizes the ramping events, stranding results, and notifications to date.

Date	Onsite during ramping?	Stranding or Isolation?	Client notification	Documentation	Sent to Client	Recommendation to Notify Agencies	Capital Power Notification to Agencies
September 14	No; onsite Sept 15	Yes – 1 RT fry mort, 4 isolated, 1 stranded	Ganshorn call to Neering; 12:00 Sept. 15	Y:\Projects - Active\1071 Mamquam IPP\1071-04 Mamquam Long Term Monitoring Study\2 Reports\Draft Reports\Lower Mamquam Hydro - Ramping Monitoring Report - Draft for Agency Review.pdf	13:07 Nov. 21	Yes	
September 15	Yes; onsite throughout plant shutdown	No	Ganshorn call to Neering; 12:00 Sept. 15	Y:\Projects - Active\1071 Mamquam IPP\1071-04 Mamquam Long Term Monitoring Study\2 Reports\Draft Reports\Lower Mamquam Hydro - Ramping	13:07 Nov. 21	Yes	

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				Monitoring Report - Draft for Agency Review.pdf			
October 6	Yes; onsite throughout ramp down through rough zone	1 stranded ST fry	Yes, email and memo Ganshorn to Neering,18:25 Oct. 6	Y:\Projects - Active\1071 Mamquam IPP\1071-04 Mamquam Long Term Monitoring Study\4 Correspondence\Memo to Marc Nering re 06-Oct-2010 Ramping Rate Monitoring.pdf	18:25 Oct. 6	Yes	
October 12	No; onsite Oct. 13	No	Yes, Ganshorn email to Neering and Tufts 11:05 Oct. 14	Y:\Projects - Active\1071 Mamquam IPP\1071-04 Mamquam Long Term Monitoring Study\4 Correspondence\Memo to Marc Nering re 13-Oct 2010 Ramping Rate Monitoring.pdf	Nov. 23	Yes	
October 17	Yes; throughout ramp down through rough zone	2 isolated ST fry	Yes, Ganshorn email to Neering and Tufts 11:08 Oct. 18	Y:\Projects - Active\1071 Mamquam IPP\1071-04 Mamquam Long Term Monitoring Study\4 Correspondence\Memo to Marc Nering re 17 and 22-Oct-2010 Ramping Rate Monitoring.pdf	Nov. 23	Yes	
October 22	No ; onsite ~9:00 Oct. 22	No	No notification provided to the client.	Y:\Projects - Active\1071 Mamquam IPP\1071-04 Mamquam Long Term Monitoring Study\4 Correspondence\Memo to Marc Nering re 17 and 22-	Nov. 23	No	

				Oct-2010 Ramping Rate Monitoring.pdf			
November 4	No; onsite 16:00 Nov. 5	No	Ganshorn call to Neering; ~15:00 Nov. 5 and email MacDonald to Neering and Tufts 12:33 Nov. 6	Y:\Projects - Active\1071 Mamquam IPP\1071-04 Mamquam Long Term Monitoring Study\4 Correspondence\Memo to Marc Nering re 04-Nov 2010 Ramping Rate Monitoring.pdf	Nov. 23	Yes	
November 22	No; onsite 09:00 Nov. 22	No	MacDonald to Neering and Tufts; 12:58 Nov. 23	\\dellserver\public\Projects - Active\1071 Mamquam IPP\1071-04 Mamquam Long Term Monitoring Study\4 Correspondence\Memo to Marc Nering re 22-Nov 2010 Ramping Rate Monitoring.pdf	Nov. 23	No	

Davies, James W FLNR:EX

From: Davies, James W ENV:EX
Sent: Tuesday, August 31, 2010 8:49 AM
To: Babakaiff, Scott C ENV:EX; Stoddard, Erin M ENV:EX; 'Knight, Francesca'; 'fknight@squamish.ca'; 'Busto, Vince'; 'Lail, Kelly '
Cc: Bennett, Timothy A ENV:EX
Subject: RE: Recent fish stranding incident (RE: Mamquam Monitoring Plan (Water File 2003040))

For Tim Bennett
If meeting is by phone, Thursday am is good, September 9.
Friday is good, September 10.

Do not have email addresses for:
Fikirdanis, Serkan;
Nering, Marc
Barrett, Rudy;
Wisdom, Tim;
Macleod, Doug

From: Bennett, Timothy A ENV:EX
Sent: Tuesday, August 31, 2010 8:39 AM
To: Davies, James W ENV:EX
Subject: FW: Recent fish stranding incident (RE: Mamquam Monitoring Plan (Water File 2003040))

From: Knight, Francesca[SMTP:FRANCESCA.KNIGHT@DFO-MPO.GC.CA]
Sent: Tuesday, August 31, 2010 8:38:32 AM
To: Lail, Kelly; Busto, Vince
Cc: Babakaiff, Scott C ENV:EX; Bennett, Timothy A ENV:EX; Fikirdanis, Serkan; Nering, Marc; Stoddard, Erin M ENV:EX; Macleod, Doug; Barrett, Rudy; Wisdom, Tim
Subject: RE: Recent fish stranding incident (RE: Mamquam Monitoring Plan (Water File 2003040))
Auto forwarded by a Rule

Hi everyone, next Thursday works for me; I can make Friday work as well, but would prefer Thursday.
Francesca

From: Lail, Kelly [mailto:klail@capitalpower.com]
Sent: Mon 30/08/2010 5:37 PM
To: Busto, Vince
Cc: Scott.Babakaiff@gov.bc.ca; Timothy.Bennett@gov.bc.ca; Fikirdanis, Serkan; Nering, Marc; Erin.Stoddard@gov.bc.ca; Macleod, Doug; Barrett, Rudy; Wisdom, Tim; Knight, Francesca
Subject: Re: Recent fish stranding incident (RE: Mamquam Monitoring Plan (Water File 2003040))

Understood.

Please advise when you have a date and time.

Sent from Blackberry

From: Busto, Vince <Vince.Busto@dfo-mpo.gc.ca>
To: Lail, Kelly
Cc: Scott.Babakaiff@gov.bc.ca <Scott.Babakaiff@gov.bc.ca>; Timothy.Bennett@gov.bc.ca <Timothy.Bennett@gov.bc.ca>; Fikirdanis, Serkan; Nering, Marc; Erin.Stoddard@gov.bc.ca <Erin.Stoddard@gov.bc.ca>; Macleod, Doug; Barrett, Rudy; Wisdom, Tim; Knight, Francesca <Francesca.Knight@dfo-mpo.gc.ca>
Sent: Mon Aug 30 18:31:41 2010
Subject: RE: Recent fish stranding incident (RE: Mamquam Monitoring Plan (Water File 2003040))

Kelly,

Thursday or Friday of next week works for me and hopefully also Francesca Knight. This meeting needs to also include MOE, so I will wait to see if Scott Babakaiff, Tim Bennett, and Erin Stoddard may be available. Both Tim Bennett and Erin Stoddard are on S22 ; so we may not know until next week if any of them will attend.

I will leave it to you to contact Adam Lewis.

Vince Busto, B.A.Sc., P.Eng.
Habitat and Hydrotechnical Engineer | Ingénieur de l'habitat et de l'hydrotechnique
Habitat and Enhancement Branch | Protection et mise en valeur des habitats
Lower Fraser River | Le bas Fraser
Fisheries and Oceans Canada | Pêches et Océans Canada
100 Annacis Parkway, Unit 3 | 100 Annacis Parkway, Unit 3
Delta, BC V3M 6A2 | Delta (C.-B.) V3M 6A2
Government of Canada | Gouvernement du Canada

Telephone/Téléphone 604-666-8281
Facsimile / Télécopieur 604-666-6627

-----Original Message-----
From: Lail, Kelly [mailto:klail@capitalpower.com]
Sent: Mon 8/30/2010 3:13 PM
To: Busto, Vince
Cc: Scott.Babakaiff@gov.bc.ca; Timothy.Bennett@gov.bc.ca; Fikirdanis, Serkan; Nering, Marc; fknight@squamish.ca; Erin.Stoddard@gov.bc.ca; Macleod, Doug; Barrett, Rudy; Wisdom, Tim
Subject: Re: Recent fish stranding incident (RE: Mamquam Monitoring Plan (Water File 2003040))

Yes.

Please advise if we can meet next week in the later part of the week.

I would like to Ada$m Lewis involved as he is in position to start the monitoring study as soon as you and Tim give us the go ahead.

Will Thursday or Friday work?

S22

Sent from Blackberry

From: Busto, Vince <Vince.Busto@dfo-mpo.gc.ca>
To: Lail, Kelly

Cc: Babakaiff, Scott C ENV:EX <Scott.Babakaiff@gov.bc.ca>; Bennett, Timothy A ENV:EX <Timothy.Bennett@gov.bc.ca>; Fikirdanis, Serkan; Nering, Marc; Francesca Knight <fknight@squamish.ca>; Stoddard, Erin M ENV:EX <Erin.Stoddard@gov.bc.ca>
Sent: Mon Aug 30 15:53:43 2010
Subject: Recent fish stranding incident (RE: Mamquam Monitoring Plan (Water File 2003040))

Kelly

This morning Francesca Knight received a report from Fisheries biologists who were on the Mamquam over the weekend taking swift water safety training. The biologists reported witnessing a number of rapid water level fluctuations over the two days, downstream of the powerhouse, that resulted in stranding of steelhead fry. The report raises some serious concerns over the impact to fish habitat, and the description of the impacts leads me to believe that the biologists witnessed what may be considered to be an harmful alteration, disruption or destruction of fish habitat. Can we set up a time to discuss next steps with you?

Vince Busto, B.A.Sc., P.Eng.
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