

**Re – Your letter of 26<sup>th</sup> August**

**Water Use Application MC08-275 (amend. to licence MS02-203)**

1b) Icy Waters Ltd (IWL) is requesting an amendment to the licence.

Accompanying documents have been revised to remove all references to the extension of the expiry date.

2) The proposed wording is included in the revised Document 2, "Requested Amendments".

3) Deletions are included in the revised Document 2, "Requested Amendments".

4) IWL has requested changes and deletions to Clause 23; Schedule A; and Schedule B.

4a) Yes, effective for the rest of the Licence duration once changed

4b) Yes

4c) Yes

5) An orthophoto of the area, with the existing (PS1-7) and proposed (PS8) sampling locations is attached.

6) This site, proposed PS8, known as "the wall" is the wooden walled overflow weir of Pump House Pond (PHP). Water from the pond flows over, or leaks through, this wooden wall, ensuring there is at least some through flow in this area. The position, according to GPS is:

UTM : 08V 491037 6734548

Lat/Long : N 60 43'30.3" W 135 09' 51.4"

7) Please see attached sheet of Lat/Long co-ordinates for all existing and proposed sampling sites.

8a) Section D refers to the monitoring requirements for the proposed PS8 sampling site at PHP. The "Requested Amendments" document has been modified to include Total Nitrate and pH at this site.

Invertebrate sampling already takes place above and below PHP. However In light of question 10a), IWL is prepared to undertake annual benthic sampling at this site.

8b) For the sampling schedule, Schedule B: IWL proposes that PS8 should replace PS4 on Schedule B. This would mean Total Suspended Solids, pH, Temperature (field),

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Dissolved Oxygen, Total Ammonia (as N), Total Nitrate (as N), and Total Phosphorous would be sampled on routine (schedule) C, and Benthic Invertebrates on routine (schedule) A.

9) IWL will no longer request this change. IWL will continue to monitor PS3 as per the Licence, and YECL Hydro #1 tailrace, to determine if there is any significant difference in water quality between these sites until the time of its WUL Renewal Application.

10) Re-Environment Yukon (EY) YESAA Decision Document (DD)

DD 2

An allowance for elevated levels of suspended solids conditions has been investigated by the monitoring regime in all the previous IWL water use licences, since IWL began operations. Every Licence's monitoring schedule has measured output Suspended Solids as "above background" at the inlet. This sampling data has been provided to Environment Yukon through the reports in the IWL Annual Water Use Licence reports.

Consequently retaining the present wording in the existing WUL, in Clause 23, fulfils this requirement.

DD 3

EY believes the primary nutrient of interest is Total Phosphorous. IWL has included the monitoring of Total Phosphorous at PS8 in PHP in its "Requested Amendments" document.

IWL understands EY is developing an "integrated database". IWL presently submits its sampling data to the Water Board for distribution within 60 days of sampling. Thus the proposed monitoring regime fulfils this requirement.

DD 4

Levels of Total Phosphorous are a significant indicator of the productivity of the biological community.

Apart from mammals at the top of the food web, all other members of the freshwater biological community in PHP are cold blooded. Their rate of productivity is directly related to temperature.

Invertebrate populations are a reflection of the nutrient and temperature balance.

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Productivity is a relative term. High or low productivity requires to be referenced to another site. The CCME requires referencing possibly "human-influenced" sites to pristine, non-influenced sites to determine what, if any, affect the influence has had.

Therefore the proposed wording in the "Requested Amendments", coupled with the unchanged parts of the existing Licence monitoring schedule, will address monitoring the indicators for productivity by sampling at PS 8 for Total Phosphorous and Temperature, with annual invertebrate sampling. IWL cautions that this data is not directly comparable to southern jurisdictions due to the significant variation in temperature regimes. PS8 data can be used as a record for the present situation, to be compared with data in the future, but is of limited, or no, value for extrapolating into the past to try to determine pre-IWL baseline data.

DD 5

DD 5 contains a major assumption that eutrophication is taking, or has taken, place in PHP. No scientific evidence has been put forward to support this.

The assumption that the IWL WUL monitoring programme should monitor such assumed eutrophication also implies that any such eutrophication is the responsibility of IWL, but again there is no scientific evidence to support this.

However, the responsibility for Fish and Fish Habitat lies with Environment Yukon, Fish and Wildlife Branch, Fisheries Management (FM). FM has undertaken Angler Harvest Surveys in 1997 and 2004 (*McIntyre Creek including Pumphouse Pond and Louise (Jackson) Lake Angler Harvest Survey 2004 – DRAFT – Aaron Foos, YTG DoE, Fisheries Section, 2006*) in the MacIntyre Creek area, which includes PHP. These surveys include calculations of Lake Productivity to determine Maximum Sustained Yields.

Important points regarding "Effects on Fish and Fish Habitat" from the 2004 Survey are:

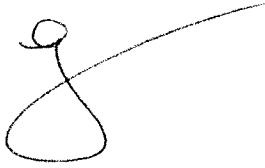
(P11) "The estimated Catch Per Unit Effort (CPUE) is the best indicator of changes in the fishery. CPUE results show slight increases for all species other than Arctic grayling from 1997 to 2004, with Arctic grayling being nearly identical." Specifically for PHP (P12) "Angler success in 2004 was higher than 1997 for both rainbow trout and Arctic grayling, and reasonable on a Yukon wide scale"

It can be seen there presently is a monitoring programme for fish and fish habitat in PHP, undertaken by EY. To require such a monitoring programme of IWL is a duplication of effort with significant economic implications for IWL, ie significantly increased costs.

Considering it is not known if eutrophication is taking place in PHP then it is difficult to develop a monitoring programme that considers indicators of eutrophication that may

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or may not be happening. IWL considers that the monitoring programme relating to DD 4 will yield information regarding possible eutrophication and will complement the present monitoring regime of Fish and Fish Habitat undertaken by Fisheries Management, EY.



Jonathan F. Lucas

3/12/09

V.P. Aquaculture Icy Waters Ltd

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Water Use Application MS08-275 (amend.to MS02-203)

Q7 - Provide Longitude and Latitude co-ordinates for all existing monitoring stations included in licence MS02-203

Sample site	Long/Lat
PS1 Hatchery Intake at site C	N 60 43' 26.7" W 135 10' 49.8"
PS2 Hatchery Outlet Culvert under Haekel Hill Rd	N 60 43' 31.2" W 135 10' 32.2"
PS3 Equivalent of Tank Farm Inlet Downstream end of Culvert under Fish Lake Rd at YECL Turbine #1	N 60 43' 21.0" W 135 11' 01.3"
PS4 Diversion Ditch "Beaver Creek" at upstream of Culvert under IWL driveway	N 60 43' 21.9" W 135 10' 43.6"
PS5 Tank Farm Outlet Upstream of culvert under Fish Lake Rd by IWL driveway	N 60 43' 21.0" W 135 10' 38.7"
PS6 Upper MacIntyre Marsh Upstream of first culvert from Fish Lake Rd under Copper Haul Trail	N 60 42' 58.9" W 135 10' 15.9"
PS7 Lower MacIntyre Marsh At old mine road crossing, below Pump House Pond (PHP)	N 60 44' 22.8" W 135 08' 45.3"
PS8 PROPOSED Overflow weir of PHP	N 60 43' 30.3" W 135 09' 51.4"

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