

Please quote the reference number below when contacting the office:

Our ref: GH/2634
Your ref:

12 June 2017

Oliver Harmar
Deputy Director-Operations
Environment Agency
Tyneside House
Skinnerburn Road
Newcastle upon Tyne
NE4 7AR

Dear Mr Harmar,

Re: Run of River Hydro at Framwellgate Dam, Durham

Fish Legal is a not-for-profit membership association which uses the law to protect fish stocks and to uphold the rights of its members.

We have been consulted by the Wear Anglers Association over deep concerns about the design and operation of the Hydro at Framwellgate, Durham (The Hydro).

As the Environment Agency will be aware, that this award-winning and much-vaunted project allegedly supplies up to 75% of the energy requirements of the Framwellgate Centre.

In the main our concerns are as follows:-

1. Ensuring that the flow regime is being adhered to.

We are concerned that this Archimedes' screw hydro is being inappropriately operated in conditions of low flow. Enclosed with this letter is a CD-ROM [Enclosure 1] containing 6 videos. Video 3 in particular shows footage taken on 19 October downstream from the fish pass with the gauge level of less than 1 ft. depth. Stills from the video help to explain the point being made and these are also included with this letter [Enclosure 2].

Abstraction licence NE/024/0005/010 governs the operation of the hydro. Condition 6.13 states: "The licence holder shall install a calibrated gauge board with clear visible markings immediately upstream of the abstraction point in the River Wear, at a location approved by the Agency, indicating the water flows required as in conditions 6.8, 6.9 and 6.11 above providing clear visible evidence of compliance. This is not present. We asked the Agency in April 2017, through an EIR request why there was no gauge board installed to which we received the following

Patron: HRH The Duke of Edinburgh | **Chairman:** Richard Vincent | **Chief Executive:** Mark Lloyd
Solicitors: Robert Younger, Andrew Kelton, Cameron Hogg, Geoff Hardy, Justin Neal
Chartered Legal Executive and Practice Manager: Penelope Gane

response (our emphasis) :- *“A gauge board is present and visible at Freemans Reach Hydropower site on Framwellgate Weir, Durham, **however due to the width of the weir and its poor condition it is very difficult to accurately relate water depth to flow. The gauge board at the site is not set at the correct height, so it will appear that abstraction is taking place outside of the licenced limits.** When installing site gauge boards unless there is a gauging station very close by it can be difficult to set it to the right level immediately. Environment Agency staff are waiting to notify site staff when the level at the downstream gauging station at Chester-le-Street is reached. Once this occurs the water level at the hydropower site will be marked in a couple of locations so that the gauge board can be re-set to the correct height. The trigger level at Chester-le-Street is yet to be reached. We are working with the site operators to install a notice outlining this.”*

This point was already taken up by representatives of Wear Anglers Association firstly with John Shelley and subsequently Chris Carter from the EA in November 2016. Mr Carter stated on 5 December (again, our emphasis); *“Due to the length of the weir at Freeman’s Reach **the gauge boards on site only provide an indicative guide** to when the hands off level (HoL) will be triggered. Prior to the construction of the HEP turbine measurements were taken on the weir at Freeman’s Reach at the same time as low flows were recorded at our control gauge at Chester le Street to try and provide a calibration of recorded levels at both sites. This was quite problematic due to variable flows downstream of Freeman’s Reach. In practice abstraction is controlled using alarms on the river level recorded at Chester le Street which ensures that the turbine stops operating at the correct flow”.*

Hence, we have a condition in the licence, designed to re-assure people publicly and transparently that there is no over-abstraction taking place, not being satisfied. Furthermore Mr Carter’s response seems to suggest that, given the length of the weir, it never can be properly met. One does therefore question why the condition was included, if it is impossible to have been met in the first place.

The choice of using gauging station data at Chester le Street some 5.6 miles downstream and extrapolating this to assume that river levels up at Durham are okay is unacceptable. Enclosure 3 is a list of all of the 35 features discharging water into the River Wear between Durham and Chester le Street. Additionally we understand there is a major potable water extraction at Lumley, 1 mile upstream of the gauging station licensed to abstract up to 40megalitres per day, but subject to variation at the discretion of the operator. Finally, we also understand that the dam at the weir will also inevitably be subject to leakage not factored in. Given this massive amount of variables, we have to ask how can the EA possibly demonstrate that this flow regime is working?

We also note that Mr Carter stated in the same email exchange that flow rates are also checked during enforcement visits. How frequent are these visits, and where are they carried out?

2. Fish Health and Welfare

We note that there are two fish passes connected with this development and that Rainton Construction (the developers) are quoted in a newspaper at the time as stating:- *“Fish are attracted to the white frothy waters produced by the Archimedes*

screw so Rainton Construction installed a system which diverts fish safely around the screw.”

We understand that during the construction phase, representatives of our member club raised the need for proper fish screening, in addition to the trash-screens already planned. The EA seemed to accept this point at the time but absolutely nothing further was done. This omission now seems to be taking effect. Our members have received numerous reports from members of the public including walkers in particular who have witnessed dead salmon and sea-trout downstream of the hydro.

We have already made reference to the videos in Enclosure 1. Aside from depiction of flow already mentioned they primarily show footage of salmon caught and being killed in the turbine chamber. We have concluded that this is down to the following reasons:

- a. Lack of any fish screens. In the EA response to the EIR referred to, it states: “Environment Agency Run of River Hydropower Guidance states that Archimedes screw turbines are not required to have fish screens other than trash screens, provided that certain criteria are met. These criteria are explained fully in the Run of River Guidance and relate most importantly to the number of blades, the speed of the tip of the blade in relation to the diameter of the screw, and the requirements for leading edge protection”. We respectfully suggest that this guidance should be re-visited, given (what we are advised is) regular occurrence of fish being caught in the chamber at the hydro, of which the videos sent to you only represent a small sample. We understand that at least two sea trout were witnessed being caught in the chamber within the last two weeks and, understandably, feelings are running very high locally.
- b. Improper design of the hydro. Enclosures 4a) and 4b) show the turbine outfall at usual river levels. Enclosure 4c) shows the outfall during a spate flow with all the open areas immersed and clearly presenting no barrier to fish entering the chamber.

We would draw your attention, when viewing the videos, to the stills and (where shown) the timings in Enclosure 2, where one can see healthy adult salmon being effectively battered to death by the turbine blades, protected by baffles though they are and being thrown against the chamber walls. In the circumstances we find the statement in the response to our EIR request of April 2017 unjustifiable. We were told: “*Archimedean Screw Hydropower Turbines (ASHT)’s have been shown to cause minimal damage to fish as long as there is appropriate protection on the leading edge of the screw and they are designed within acceptable limits.*” Clearly in this case a baffle-protected turbine in a scheme within the ‘acceptable limits’ is killing significant numbers of fish. Despite what was said when this scheme was designed there is clearly no systemic protection for these fish, whose stocks are under threat from a wide range of factors already. The Angling Trust, our sister body, was elected to lead the ‘Save Our Salmon’ campaign and neither they nor Fish Legal are prepared to sit by and allow hydro schemes

of flawed design to kill fish at a time when anglers are having restrictions placed on them for catch and release.

- c. Failure by the EA to recognise the issue. We understand that some 6 to 8 salmon deaths were witnessed by EA staff in September 2016, however the EA (in a surprising display of ignorance of the salmon life-cycle) excused the dead fish as being kelts, when no kelts would ever have been in the river at that time of the year. We understand that the dead fish were taken away, but we are not aware that any autopsies were carried out to confirm cause of death. If they were, please could we see the results?
- d. The apparent mismatch between the monitoring of fish passage and the suspension of turbine operation. Condition 6.18 states that if threshold values (per the table) are not met for 6 consecutive days during June to November the abstraction must cease for 24 hours. Under condition 6.19, if there are zero fish counts on three consecutive days between June and October the abstraction must similarly cease for 24 hours. However the assessment of compliance with the passage thresholds only take place on two working days each week, we therefore fail to understand how assessments over 3 and 6 consecutive days are possible? Furthermore we are concerned that the condition at 6.18 is too generous in that the threshold levels are too low. Lastly, sea trout and salmon are known to favour passage during a lift of water and during the hours of darkness. We are concerned that reference to 'working days' incorporates only the hours of the working day and therefore evening, night-time and early morning passage is not adequately reflected and catered for.

Finally, although this does not relate to fish welfare, our members have noted that the buildings at Framwellgate are frequently fully illuminated when the complex is clearly shut. It does seem a waste of resources to construct a power generator and then use this energy to light the facility.

The way forward

The EA, respectfully, needs to regain the regulatory imperative in this case. A properly regulated gauging point needs to be established as close to the weir at Framwellgate as possible together with an accurate and visible gauge board to re-assure our members and the public at large.

Proper fish screening needs to be erected up and downstream of the hydro and to include the complete turbine chamber, with no gaps for fish to enter when flow conditions make it currently possible. The EA ought also to learn from this example. Inappropriately designed Hydros with inadequate monitoring have the potential to do far more damage to the environment than the benefits they purport to bring.

We look forward to hearing from you as soon as possible that these works will be taking place and receive a timetable for the same please. To summarise, can we also be supplied with details of the enforcement visits mentioned by Mr Carter as well as the results of any of the autopsies of dead salmonids taken away by the EA.

Can you kindly acknowledge receipt of this letter?

Yours sincerely,

A handwritten signature in black ink, consisting of stylized, overlapping loops and lines, likely representing the initials 'GH'.

Geoff Hardy
Solicitor

Encs.