Changes to the Eels Regulations Process (ChERP) Project

Deriving acceptable cost and exceptional cost for intakes[1]

October 2019

Dear Agriculture sector

Thank you for you participating in our May webinar, when we presented the first draft proposals within our 'Changes to the Eels Regulations Process' (ChERP) project.

From subsequent feedback we noted a common query across sectors was around definitions for some aspects of our draft proposals. This included how we will define the economic feasibility for an operator implementing various 'Best Achievable Eel Protection' (BAEP) measures[2]. Appendix 1 illustrates some current examples of BAEP technology for agricultural intakes.

The proposed new regulatory process includes a step in the decision-making where an operator's proposed costs can be checked against what we consider to be the typical range of installed (and therefore acceptable) costs for that particular Sector. We want to engage with you now to review typical cost information and agree atypical or 'Exceptional' cost thresholds[3]. For proposed costs above these agreed thresholds, we may accept a cheaper/less protective option to be installed at a given site.

During this engagement phase of the ChERP project we would like to share with you our findings, derived from the cost (**Cap**ital **Ex**penditure) data we hold for BAEP solutions that have been recently installed by agricultural operators.

For consistent application across sectors and intake types, the standard metric we have derived from the CapEx data is **cost/cumec**[4] (cumec = a flow rate of one thousand litres per second or approx. 87 megalitres per day).

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[1] This engagement document presents data to inform discussion on acceptable costs for delivering a range of BAEP solutions for water intakes. Further engagement will follow in order to confirm acceptable costs for installing eel passage solutions at obstructions.

[2] As new technologies for eel protection become available we will incorporate these into our guidance (including costs) as appropriate. Any new evidence to inform our regulatory decisions on eel measures will also be adopted within our guidance. This may happen between scheduled document review dates if necessary.

[3] The prices of technical eel solutions will rise in line with inflation. In order to future-proof eel protection the agreed thresholds will be periodically reviewed to stay in line with inflationary changes.

[4] Capacity figures in cumecs (cubic metres per second) refer to the maximum rate at which an abstractor is licensed to abstract, or in cases where there is no licensed rate, the maximum rate that the structure is capable of diverting. It does NOT relate to the actual abstraction rate at any point in time nor the actual rate over any period of time.

Figures 1 and 2 display separately the cost data that we hold for specified BAEP solutions recently installed by agricultural abstractors. We have plotted the **scaled** costs of BAEP solutions (in the standard £k/cumec format) against the capacity of the intake at which the BAEP solution was installed (in cumecs).

Based on these figures we are proposing to develop thresholds above which costs for different BAEP solutions will be deemed **'Exceptional'**. We would welcome any additional/better data and evidence from you and your wider sector to make these thresholds as accurate as they can be.

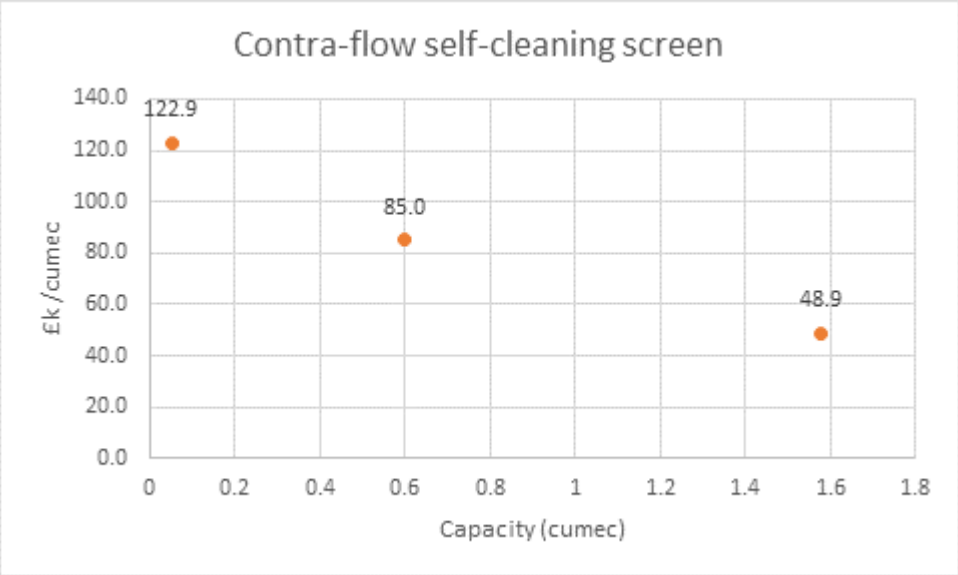

Figure 1. Indicative costs of specified BAEP solution for a range of intake capacities.

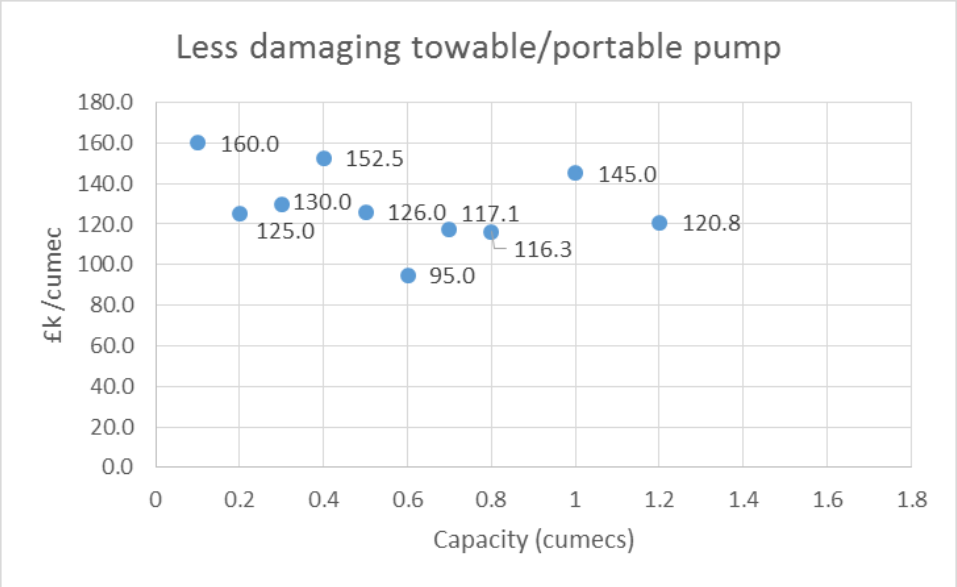

Figure 2. Indicative costs of specified BAEP solution for a range of intake capacities.

Given that we hold limited data on costs, it is reasonable to expect a greater degree of variability across the true range of installation costs than we can see in our dataset. For this reason we will apply an upper confidence level of +10% to the current data points in order to establish more realistic thresholds.

From the data we hold the highest costs to install each of the BAEP solutions listed are as follows:

1. Contra-flow self-cleaning screen: £122,920/cumec *(+10%:* ***£135,212/cumec****).*

2. Less damaging towable/portable pump: £160,000/cumec (+10%: **£176,000/cumec**)

It is important to recognise that these are **scaled** costs, rather than actual costs of installing eel protection. For example if the intake is 0.1 cumec (or 100 litres per second) this would translate as actual costs of £12,292 (+10%: £13,521) and £16,000 (+10%: £17,600). Appendix 2 presents some illustrative examples of how actual costs would be considered against an 'Exceptional cost' threshold.

Other known BAEP technologies, for which we currently have no cost data, are:

- Bar Racks of appropriate dimensions.
- Pump intake strainer boxes of appropriate dimensions.

If you are able to provide us with any installation costs for these BAEP technologies we would welcome them.

We plan to use these data and thresholds in our full ChERP project 'testing phase' this autumn in order to validate that they work practically within our new process. Any comments and extra data therefore need to be received by your sector leads by no later than **8th November** 2019 to be incorporated in this validation.

If you have any initial comments or queries please do not hesitate to get in touch sooner, via your sector leads **Bob Hillier** and **Louise Weller**.

Regards
The ChERP team

Appendix 1:

Current examples of Best Achievable Eel Protection technology for agricultural intakes:

Contra-flow self-cleaning screens:

The repeated fouling of suction strainers is a common issue for agricultural abstractions, particularly when finer mesh gap sizes are required for fish and eel protection. This has resulted in their removal and led to fish mortalities. A small number of manufacturers offer self-cleaning strainers that are appropriate for agricultural abstractions. In the UK, Rotorflush and in the U.S., Yardney, Sureflo and Lakos offer self-cleaning inlet screens for surface-mounted pumps (Figure 3). They tend to work on a similar basis, by returning up to 10% of the pump output to the filter, in order to drive a rotating spray bar in the middle of the filter that continually back-flushes the screen and reduces the need for constant maintenance. The screens are available in various sizes to cater for a range of pumping apparatus, can be moved around on site and transferred from one pump to another, or installed as fixed array s for larger abstractions. They can be designed for intake gap sizes and approach velocities to cover Eel Regulations compliance.

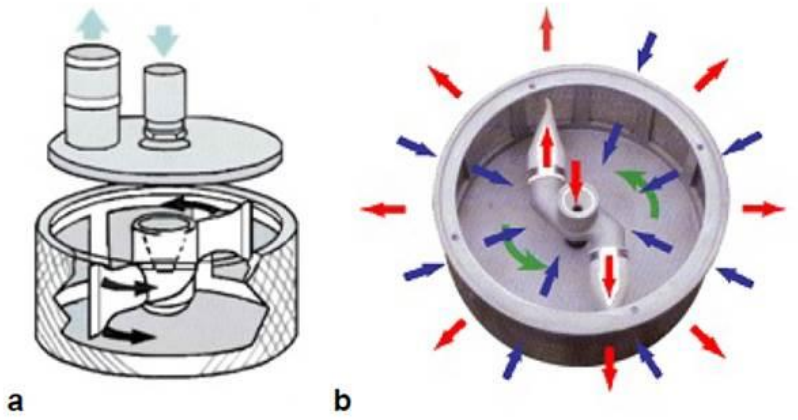

Figure 3: The Rotorflush RF works by redirecting a percentage of the pumped water (red) to a dual-head rotor. This creates jets that flush the filter screen up to 120 times per minute.

Less damaging Portable/Towable Pumps:

Where water is being pumped from one waterbody to another (rather than for e.g. spray irrigation), and the receiving waterbody can allow any pumped eels to complete their life-cycle, then certain types of mobile axial flow pumps can facilitate this. These pumps are termed “less damaging” or “fish-friendly”, due to their pipework and impeller design and can pass certain sizes of eels with minimal injury, when operated within certain limits. Examples of mobile pumps of this type are the Hidrostal Betsy/Super Betsy range in Figure 4:

Figure 4: Hidrostal Betsy 125M Mobile Pump

Appendix 2:

Examples using the Exceptional Cost thresholds for Best Achievable Eel Protection for agricultural intakes. NB for illustrative purposes only at this stage.

Scenario 1: An agricultural operator has a licence to abstract a maximum instantaneous flow of 80 litres per second from a local river for the purposes of spray irrigation. She is required to screen the intake to protect eels, to criteria set by local Environment Agency Fisheries staff. The abstraction is carried out using a mobile 6" pump. A quote is obtained for the provision and installation of a contraflow self-cleaning screen which totals £6,500. Upon receiving this information, Environment Agency staff would assess the costs as follows:

The cost of the quote would be factored-up to make it comparable with the cost/cumec (or 1000 litres per second) threshold. In this case, 1000(litres) divided by 80(litres) = 12.5. £6,500 multiplied by 12.5 = £81,250 per cumec for that site.

£81,250 falls below the illustrated Exceptional Cost threshold of £135,212/cumec for this BAEP. Therefore the operator would be expected to proceed with this installation to comply with Eels Regulations.

Scenario 2: The same operator has another intake in the area which requires screening. It also has a licence to abstract a maximum instantaneous flow of 80 litres per second from a local river for the purposes of spray irrigation. However, this intake is a fixed pump and concrete intake structure set into the river bank. A quote is obtained for the provision and installation of a contraflow self-cleaning screen which totals £11,000. The extra cost is due genuine site-specific difficulties in carrying out civils work to break out and reconstruct the existing intake structure to accommodate the screen.

Again, Environment Agency staff would assess the costs as follows:

The cost of the quote would be factored up to make it comparable with the cost/cumec (or 1000 litres per second) threshold. In this case, 1000(litres) divided by 80(litres) = 12.5. £11,000 multiplied by 12.5 = £137,500 per cumec for that site.

£137,500 falls above the illustrated Exceptional Cost threshold of £135,212/cumec for this BAEP. Therefore, once all other BAEP solutions had been ruled out for this intake, the operator could seek an Exception for the site based on Exceptional Cost. This would then bring in other parts of the Exceptions process – currently in development through the ChERP project.