Written evidence for the Environmental Audit Committee (EAC) inquiry into water quality in rivers from Mrs Jo Bradley, UK Director of Operations at Stormwater Shepherds UK

Stormwater Shepherds UK is a new organisation, created as a partner to Stormwater Shepherds in Australia which has been operating for 2 years. Stormwater Shepherds is a not-for-profit organisation intent on reducing plastic pollution from towns & cities. We employ positive action such as litter cleans to reduce pollution; we collect data and share information to educate communities and businesses on pollution control, and we advocate for better regulation of polluted stormwater discharges.

1. **What are the best indicators for river water quality that could be used as targets being developed under the Environment Bill?**
   The best indicators for river water quality remain the measurement of macroinvertebrate populations, fish populations and water chemistry. The Environment Agency monitoring programme can be effective if it is properly resourced and includes monitoring points across catchments and up smaller tributaries so that we are able to see a complete picture of the health of entire river catchments. New technology and the creation and calibration of proxy pollutants can allow remote monitoring of some catchments whilst we focus our practical sampling capacity on waterbodies that need more attention. For example, some of the main river sampling points have returned the same, or similar, results for decades so we can divert our attention and resources away from them and turn it to waterbodies where investment and changes may deliver improvements that we need to measure.

2. **How could drainage and sewage management plans, introduced by the Environment Bill, play a role in reduced sewer discharges?**
   Drainage and Wastewater Management Plans provide a great opportunity to model entire sewerage systems and to identify where improvements need to be made. But there are two significant issues to consider with the DWMPs. They can become 'time-thieves' if they are not carefully managed and divert resources away from design and delivery of actual infrastructure improvements; they must be managed carefully to make sure they do not become too big to be effective. But, despite that consideration, I have suggested several times that their scope must be expanded to include pollution from surface water sewers. When the DEFRA guidance on DWMPS first appeared, it said that they would model pollution from all of the network, including surface water sewers, but that reference disappeared and I am keen to see it put back into the scope of the plans. If they do not consider pollution from surface water sewers, then we will, once again, allow urban pollution to be overlooked, under-reported and unresolved for another generation.

3. **How adequate are the monitoring and reporting requirements around water company discharges? How can technology improve and assist with transparency and enforcement?**

I haven' t been involved in monitoring water company discharges for awhile, but I am aware that self-monitoring is a fragile process and must be 'propped-up' with decent auditing and spot-visits. There has also been too much focus on final effluent quality, and no attention to the monitoring and management of other aspects of the Permits such as Flow to Full Treatment and we need to restore this balance. The shift to 'Modern Regulation' twenty years ago has gone too far and the monitoring has become too desk-based. We need to shift that and restore proper, effective regulation.

Remote cameras and real-time monitoring equipment can be deployed and monitored remotely, but there is still a need for site visits and for the Agency officers to have a comprehensive knowledge of the wastewater treatment works that they regulate.

4. **What is the impact of plastic pollution and other materials on drainage and water quality in rivers and what should be done to mitigate it?**

The full impact of **microplastics** on the health of aquatic animals is not fully understood yet; only this month a paper was published[1] that describes how it observed that environmentally exposed microplastics can translocate from the gastrointestinal tract into the tissues of macrophages, likely by cellular internalization. Research similar to this is ongoing globally, to measure how microplastics behave in aquatic environments and how they 'carry' toxic compounds into the tissues of aquatic organisms.

Macroplastic pollution is different, as the harm it effects is associated with strangulation, entanglement, compromise of stomach capacity and other physical effects.

The solutions to these two problems are very different and fall under the jurisdiction of different regulators. **Macroplastics** entering the water environment constitute 'litter' and should be managed accordingly, primarily by local authorities; the litter should be managed at source and not be allowed to get into the water environment. Organisations such as Keep Britain Tidy and the Marine Conservations Society are doing excellent work on this and the advent of Deposit Return Schemes & reverse-vending should have a significant impact.

But **microplastics** entering the water environment via urban runoff and sewers constitutes water pollution and must be regulated and controlled by the Environment Agency and, where it is a Trade Effluent issue, by the water companies. A significant proportion of the microplastics entering the water environment in the UK come from tyre wear particles in road runoff and these microplastics have toxic compounds 'stuck' to them which are also carried into the rivers & streams. This pollution should be controlled using the existing mechanisms in the Environmental Permitting Regulations and the Agency already has the power to apply the Regulations; they are simply choosing not to. With a simple redeployment of a small number of officers to this topic, they could serve notice on some highway outfall discharges and require the application for a Permit and the application of appropriate Permit conditions. There is no clear or justifiable reason why this process is not already underway. It would reduce this

pollution and treatment systems would be installed that capture over 50% of the microplastics before they entered the rivers and streams.

If a Stormwater Utility Charge mechanism could be introduced, or Extended Producer Responsibility Levies could be applied to tyre manufacturers, we could generate a fund to pay for plastic pollution prevention.

5. **How can consumers be persuaded to change their behaviour to minimise pollution?**
   Behaviour management is not an area that I am qualified to comment on.

6. **What is the required investment level needed to minimise storm overflows vs the scope for sustainable drainage and nature-based solutions?**
   If the Drainage and Wastewater Management Plans are effective, they will identify catchments where the installation of retro-fit SuDS are the most appropriate and cost-effective way to reduce CSO spills and to deliver nature-based solutions that add to the place-making of local communities. In older catchments, where combined sewers carry all the drainage, quick and cost-effective 'wins' can be delivered by taking road runoff out of the sewer and re-directing it to the watercourse, via a treatment system or SuDS scheme. By identifying these opportunities, spill frequencies at CSOs can be reduced and pollution will be reduced quickly. I am currently looking at opportunities to deliver a case-study for this work in Lancashire and I will be happy to share the findings of that work when it is complete.
   The cost of these retro-fit SuDS schemes to remove surface water and/or road runoff from combined sewers is high but there are multiple benefits that must be measured against those costs. The widespread removal of surface water from the sewer will reduce the costs associated with the conveyance and treatment of the sewage; the surface water will be returned to the local water environment; the pollution is treated at source, making it more cost effective; the SuDS scheme can enhance the local area, providing habitat for wildlife and amenity areas for people, and sometimes the SuDS can be incorporated into traffic-calming or pocket parks for the local street-scene. Once again, if a Stormwater Utility Charge mechanism could be established, it would provide a source of funding to carry out this work.

   We need to remember that some storm overflows are acceptable, and that our rivers have the capacity to handle a certain amount of pollution. The trick is to work out where that capacity is being overwhelmed and where we need to invest in retro-fit SuDS to reduce spill frequencies and restore water quality.

7. How effective are the planning policy and standards around sustainable drainage systems to reduce urban diffuse pollution in England?

The reference to water quality and pollution control in the National Planning Policy Framework needs to be strengthened. Despite its recent review, the NPPF is still very weak with regard to water quality and it needs to place a duty on developers to comply with the SuDS Manual or site-specific guidance for high-risk surfaces so that the Planning Authorities can insist on good pollution prevention designs.

We must go back to having the Environment Agency as a consultee on the water quality aspects of planning applications. Currently, the Agency neither see, nor comment on the majority of planning applications so the water quality elements of SuDS design are not assessed by water quality experts. This is a particular risk where groundwater pollution is possible. The SuDS teams at the local planning authorities do their best, but they are rarely equipped with the expertise to asses SuDS designs for high-risk developments such as roads, industrial estates, large commercial developments etc. This is allowing poor SuDS designs to be constructed, adding to urban pollution across the UK. I can provide details of a number of SuDS schemes where the water quality element of the design has been inadequate.

8. Should local authorities and highways agencies be given a duty to prevent pollution to watercourses without prior treatment?

Yes, but that duty to prevent pollution already exists; it is just not enforced. The legislation is already in place; it is a criminal offence to cause or to knowingly permit a water discharge activity unless you are complying with an environmental permit or exemption. The Environmental Permitting Regulations say that highway authorities can discharge the road runoff to the water environment without the need for a permit as long as it doesn't cause pollution. But all runoff from roads with a traffic density above approx. 15,000 Annual Average Daily Traffic causes pollution every time it rains. Road runoff contains toxic metals, carcinogenic organic compounds and microplastics and these pollutant levels must be reduced to an acceptable level before the runoff is allowed to discharge. So, since the duty already exists in law, it simply needs to be enforced by the Environment Agency.

9. How effective is Ofwat's remit and regulation of water companies? Does it facilitate sufficient investment in improvements to water quality, including sustainable drainage systems and nature-based solutions such as constructed wetlands?

Ofwat has been very effective over recent decades and there have been huge improvements in effluent quality at Wastewater Treatment Plants and improvements in river water quality associated with this investment. But there needs to be more flexibility in their approach, to allow water companies to consider Catchment Based Approach or Catchment Systems Thinking, where pollution is considered across a catchment and solutions can be delivered where it is most cost-effective to do so, with

the most benefit for the local community, even if that is away from the water company assets.

The Environment Agency has focussed too much for too long on pollution from water companies, simply because that is where the majority of the Permitting income comes from. But the pollution comes from multiple sources across a catchment and Ofwat and the Agency need to widen their focus to consider other sources of pollution and other solutions to pollution, rather than being blinkered by the income streams. There are sources of pollution that have had no attention for decades and it is about time they came into the spotlight and were addressed, instead of chasing tiny gains at a WwTW that are disproportionately expensive.

And we need to eliminate the 'fear-factor' associated with SuDS adoption and maintenance. They are easy to maintain – it's basically just gardening! - and the more we use them, the more people will get used to them. Sometimes we have to have the courage of our convictions and do the right thing, even if we get some complaints and push-back because is it unfamiliar.

Finally, Ofwat need to 'unpick' the 'stormwater conveyance & treatment' component of the water bills that customers pay. If that income could truly be directed to the conveyance & treatment of stormwater, it would allow the installation of these devices & schemes to proceed quickly & to deliver water quality improvements.

10. <u>Is adequate investment being made in adapting water treatment systems to future climate change?</u>

I'm not going to answer this question in detail, because it would take too much space, but we need to massively increase our use of rainwater capture & re-use. We all know that it makes no sense to use potable water for watering the garden & washing the dog and yet we are doing nothing about it. If water companies can be given the mechanism to design, install, own & operate community rainwater harvesting systems and to charge customers for the non-potable water, that might help to get these systems included on new residential developments. It should be mandatory on all developments in water-stressed areas such as the chalk-stream catchments and then, when we have more experience of the systems, they should be mandatory on all developments. Even in areas that are not water-stressed now, we can be pretty sure that they will be in the next 50 - 100 years, so there is no excuse not to plan ahead and to include these mitigation techniques now.

We must also increase the focus on protecting groundwater from pollution on every development. Currently we only protect groundwater that is being used by people for drinking water, irrigation etc. But as water scarcity increases, we will need to consider the use of other groundwater sources, so we must protect all groundwater from pollution now, so that it is available for our use, and it doesn't pollute rivers & wetlands in the future.

11. <u>How could the designation of inland bathing waters by water companies affect the costs of achieving the associated water quality standards?</u>

I am passionate about the improvement of water quality in the UK and it has been the purpose of my entire career to date. But I fundamentally disagree that the designation of bathing waters should be used to drive improvements in water quality. Rivers belong to wildlife; it is where they live. We use the water for many things, but rivers & streams are not our habitat and it is wrong to drive water quality improvements on that basis. River-swimming is fine where it can be done safely without affecting local wildlife, but recreational activity of humans mustn't be the driver for water quality improvements. At Hackney Marshes this summer, where hundreds of people congregated to swim in the river, local nesting birds were disturbed and abandoned their nests. So outdoor swimming must be done sensitively, in numbers and places where it has no detrimental effect; it is not the role of wildlife to 'make-way' for our recreation.

So, for example, where we designate a river as an inland bathing site, then the focus for water quality 'zooms-in' on human health – how do we reduce the levels of faecal indicators to an acceptable level? But actually, aquatic creatures aren't that bothered by faecal indicators; they are affected by oxygen depletion, toxic metals, sedimentation of spawning grounds and eutrophication. So on the River Wharfe at Ilkley where the river is to be designated for inland bathing, there is huge focus on the CSO spills affecting the river. I don't disagree that the spills from the CSO are unacceptable and happen too frequently, but what about the runoff from the main roads and the M1 – they are not being addressed at all. For the aquatic life, the reduced CSO spills will be excellent, but they also need the road runoff to be addressed to remove the toxic metals and carcinogenic, bio-accumulative compounds from the river. We are allowing ourselves to be distracted from the true purpose of environment protection, by high-profile, headline-catching topics and it is a mistake. We need to refocus on the function of rivers & streams and the life within and around them, and stop trying to appropriate every habitat for human-use. We will regret it in the future if we get this wrong now.

[1] Environmental exposure enhances the internalization of microplastic particles into cells by A. F. R. M. Ramspergeret al. *Science Advances* 09 Dec 2020: Vol. 6, no. 50, eabd1211

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