The Royal Society of Chemistry (RSC) welcomes the opportunity to respond to the House of Commons inquiry into *Water Quality.*

1. The RSC is the largest organisation in Europe for advancing the chemical sciences. Supported by a network of 47,000 members worldwide and an internationally

should be emphasised that it is the *overall* risk from substances that is the key parameter in deciding what chemicals should be controlled in water discharges. The overall risk takes into account not just the intrinsic hazard of substances but also, crucially, the likelihood of a significant exposure to these substances in water.

5. *Acceptable Thresholds and Current Controls*
Acceptable thresholds for chemicals that need to be controlled are currently derived from the Environmental Quality Standard (EQS) for that substance, alongside consideration of the environmental sensitivity of the receiving water (e.g. are there any protected species present?) and the downstream use of the source (e.g. public supply, irrigation of crops). Limits should be set with specific parameters, based on the best available scientific data and an understanding of current detection techniques.

What are the roles of the public, industry, regulators and Government in ensuring chemicals that pose a risk are effectively controlled?

6. The government must produce appropriate legislation to ensure that substances which pose a risk to the environment and/or human health are identified and controlled. This legislation must be developed with appropriate scientific advice to ensure that it is based upon sound evidence. This can include advice from the network of Chief Scientific Advisers, as well as specialist committees. Committees such as the UK Chemical Stakeholder Forum and the Hazardous Substances Advisory Committee are important mechanisms in providing scientific advice in relation to the management of chemicals in the environment.

7. In general, the role of regulatory agencies includes identifying issues in the discharge of controlled chemicals, proposing limits, providing advice, ensuring monitoring is undertaken and enforcing regulations. As part of their role in constructing and enforcing regulation, they have a role in providing input on the efficacy of such regulations.

8. Industry can take a lead in eliminating the use of particularly hazardous chemicals by identifying ways to reduce, replace or substitute these. A 2010 workshop on *Pharmaceuticals in the Environment* by the European Environment Agency identified 'green pharmacy' as one way of reducing the environmental impact of pharmaceuticals. Green pharmacy is defined as *the design of pharmaceutical products and processes that eliminate or reduce the use and generation of hazardous substances.* The report suggests that incentivising green pharmacy (e.g. extending patents for such products) could help to reduce the environmental impact of pharmaceuticals. Industry is also required to comply with national regulations and European directives.

9. The general public have a limited role in the control of chemical risks, but they can be encouraged to minimise the use and discharge of hazardous chemicals (see paragraph 11).

Should pharmaceuticals in water discharges be better controlled and if so, how could this be[.)]TETB/F4-(u)-(R)-(o)-(le)(d)-(en)(1)--(com)-(ac)-(o)-2[pa)(te)-(nts)-2)-2(en)(1ETB)-(y)(12)-(k)-(n5(y)(12

fields, bypassing wastewater treatment plants. Before investing money in upgrading wastewater treatment processes to remove pharmaceuticals, it may be prudent to examine the relative contribution from domestic and industrial wastewater of human origin and that coming directly from livestock. Encouraging the correct disposal of unused pharmaceuticals by the public is important. One option would be to include a prominent warning on pharmaceutical packaging that unused items must be returned to the pharmacy for safe disposal.

12. There is a particular concern over the discharge of antimicrobial agents that has less to do with the ecotoxicity of these substances and more to do with the propensity of bacteria exposed to such agents to develop and then exchange antibiotic resistance genes. Assessing the levels of antimicrobial agents already in the aquatic environment and their effect on antibiotic resistance is an area of research that needs to be given some priority. Moreover, it has been shown that the over-prescription of antibiotics is a significant factor in decreasing the effective treatment of bacterial infections in humans and also detrimental effects in the aqueous environment with respect to antibiotic resistance of wild-type bacteria.

13. Industrial discharges in relation to the manufacture of pharmaceuticals are another area where control can be exercised and there are already mechang e

facility, once a new technology has passed proving and pilot stages, it must be assessed in real scenarios. This requires incorporation into working water treatment systems, which can carry regulatory, operational and public health risks, which must be managed.

17. Non-technological innovations can help achieve sustainability objectives and protect water quality. For example, land management practices to reduce diffuse pollution and flooding have been adopted successfully across some parts of the UK (e.g. in Wales and Scotland). These catchment based approaches often have synergistic environmental, economic, societal and landscape benefits.

18. The European Commission is addressing the link between water research and innovation by setting up a European Innovation Partnership (EIP) on water. The aim is to bring together stakeholders from research, industry, policy, finance, governance and other areas to g0 0 1 14217.49 , wTBT(7o)-7()-3(t)-1Tm[a03.18 Tm[tec)-3(i)59(no)4(l)-( )-1-14(ea)4(

of the contraceptive pill. No analysis has been carried out to understand the likely impacts if these medicines were no longer widely available. A cost-benefit analysis should be carried out for each substance. This will need to consider the economic impact of installing new treatment technology, as well as the impact on patients from the withdrawal of medicines.

adverse effects be mitigated?

24. EC standards should not be adopted without examination by UK experts, who should also consider if such standards are appropriate to UK conditions. The main likely impact would be a need to minimise and/or remove