



HOUSE OF LORDS

Industry and Regulators Committee

Corrected oral evidence: Follow up: Ofwat, the water industry and the role of the Government

Tuesday 4 July 2023

3 pm

Watch the meeting

Members present: Lord Hollick (The Chair); Lord Burns; Viscount Chandos; Lord Cromwell; Lord Gilbert of Panteg; Baroness McGregor-Smith; Lord Reay; Baroness Taylor of Bolton.

Evidence Session No. 3

Heard in Public

Questions 21 - 32

Witnesses

[I](#): Ruth Barden, Director of Environmental Solutions, Wessex Water; Sarah Jenner, Strategic Catchment Lead, United Utilities.

Examination of witnesses

Ruth Barden and Sarah Jenner.

Q21 The Chair: Good afternoon and welcome to the Industry and Regulators Committee inquiry into the water industry, Ofwat and the role of the Government. I am delighted to welcome this afternoon Ruth Barden and Sarah Jenner, who will tell us a bit about who they are, to discuss nature-based solutions. During our main inquiry, we learned that they can play a significant part in addressing some of the infrastructure problems that we are now becoming increasingly aware of.

Ruth, would you like to start? Tell us who you are and give us, please, a description of these solutions. In particular, it would be helpful if you could comment on the distinction between nature-based antipollution and nature-based run-off management to new readers like me.

Ruth Barden: I am director of environmental solutions at Wessex Water. Thank you very much for inviting me today.

To set the context, it would be useful to describe what we mean by catchment-based and nature-based approaches. On the catchment side, water companies have been working with landowners for a number of years now, primarily to look at methods to reduce the amount of agricultural chemicals, which can impact our drinking water abstractions, either ground water or surface water, and so are working with farmers to promote efficiency and different changes in land management. That is one of the catchment approaches.

We also have catchment permitting, which is much more of an asset-based approach whereby we look to optimise existing sewage treatment works to deliver reductions perhaps in nutrients at scale, also across a river catchment, and to catchment nutrient balancing, which combines catchment management and offsetting, working with farmers, and the catchment permitting side. Then we have a range of nature-based solutions, which go from much more naturalised solutions such as river restoration and integrated constructed wetlands to the more engineered solutions such as reed beds.

The right solution for the right issue that you face is a bit of a pick-and-mix. Certainly in a rural area we might look to work more with the agricultural sector and land management sector on run-off. In an urban area, it might be working more with local authorities to look at the opportunity for SUDS and reducing run-off from roads and urban areas, for example.

For our individual assets, we have opportunities on the catchment permitting side of things, or nature-based solutions, constructed wetlands or more engineered solutions if you are talking about an end-of-pipe way to reduce the impact of pollution on a water course.

Sarah Jenner: I am strategic catchment planning manager at United Utilities.

Nature-based and catchment solutions come in a broad spectrum, from landscape change and restoration—for United Utilities, that might be peatland restoration; we have quite extensive land ownership to protect drinking water quality—to the other end of the spectrum, where you may be looking at things like sustainable drainage. Some of that can be more engineered, where you have nature tying in with more engineered systems but are trying to bring the best of both to address an environmental issue and effectively to get the landscape to act more like it would have done if it were not so urban. It is a broad spectrum.

The Chair: What are the advantages? Price? What are the other benefits of this solution as opposed to steel and concrete?

Sarah Jenner: The biggest advantages are in the wider benefits that they deliver. Engineered solutions often target one particular issue, and they benefit that but do not bring a broader benefit. Sustainable drainage systems, for example, could bring water quality benefits, reduce flood risk, improve amenity and the liveability of our cities as climate change accelerates, and bring biodiversity benefits. That is the biggest benefit.

Some catchment nature-based solutions will be cheaper but not necessarily all. The wider benefits are key to making these work. Therefore, partnership becomes key, because those wider benefits may have multiple beneficiaries and require co-funding to get them off the ground. That is the very different thing about nature-based solutions: the broader benefits they deliver.

Q22 **The Chair:** How enthusiastically are nature-based solutions used and the opportunities grasped by the water companies?

Sarah Jenner: Water catchment management is quite mainstream and has been done quite extensively. United Utilities has been working for around 20 years now to improve the land to protect the water quality. We have done peatland restoration extensively. We have a long-standing partnership with the RSPB at our Haweswater estate in Cumbria, because we recognise that what is good for water is good for nature. We come from different places—one is an environmental NGO and the other a water company—but we have aligned interests, so we work closely together. It has a long-term tenancy there, because its objectives are managing that landscape to improve the water equality for us.

The Chair: Ruth, do you agree with that? It seems in some ways, from the evidence that we have taken, that these types of solutions have an orphan status in the industry.

Ruth Barden: They probably have not necessarily been as adopted as they could have been. As Sarah was saying, certainly when it comes to drinking water protection, most water companies have been doing that for in excess of 10 years. Again, we have been working extensively with the farming and landowner sector, particularly in Dorset. We are slightly different to Sarah in that the work we have been doing in Poole Harbour is on land that we do not own, so we have a business-to-business

relationship with farmers to enable them to deliver their productivity more efficiently without perhaps wasting some of the chemicals that are ending up in groundwater and not in the crop. That is much more mainstream among water companies at the moment than possibly the nature-based solutions on the wastewater side of things.

Also, the permitting has been less well adopted. At Wessex Water, we have our Bristol Avon catchment permit. We worked with the Environment Agency in 2015 to develop that. That was the first catchment permit to be used by a water company, and we have had a couple of iterations of that since then given that it has been so successful. We have also now worked with the Environment Agency to develop catchment-nutrient balancing permits in the Tone and Parrett catchment and the Dorset Stour catchment, combining the catchment permitting with the offsetting. I believe there is also one of those in the Petteril catchment. They are the only examples of that type of innovative permitting in the water industry.

Again, we have been using wetlands as well. We have the first phosphorus removal wetland at our Cromhall sewage treatment works in South Gloucestershire. That is testament to the additional benefits which that provides. Although it was designed for phosphorus removal, it delivers a significant amount of nitrogen removal and about 70% removal of emerging contaminants, which are pharmaceuticals, as well as a 95% reduction in microplastics. It removes the human faecal indicator organisms, which are of real relevance for recreational bathing waters, beyond the limit of detection. Given that it is treating purely domestic sewage, that is quite remarkable for a nature-based solution.

That is very much at the pilot stage. There has not necessarily been the ability to adopt that more widely across the industry, partly because the data is still emerging on the effectiveness and the permitting is still being worked on with the Environment Agency to mainstream those solutions.

Q23 Viscount Chandos: From the perspective of a water company, what are the principal barriers to the adoption of nature-based solutions?

Ruth Barden: From my perspective in Wessex Water, some of the challenges have been the data and the confidence in the effectiveness of these particular treatment solutions, not so much the catchment side of things. The permitting and regulatory barriers remain. We are still developing these permits to understand what they look like.

There are also issues with discrepancies, perhaps between outcomes that have been identified in government policy or primary legislation and how that translates into guidance and the detail. That becomes a lot more prescriptive, which makes it quite challenging to implement these solutions.

An example is the Levelling-up and Regeneration Bill, which is going through Parliament at the moment. That has a significant impact on Wessex Water. We are fortunate in that we live in an environmentally

sensitive location, but that creates challenges in terms of sewage treatment works improvements. About 46% of our area will be covered by nutrient neutrality under that legislation, which means that all sewage treatment works in areas above 2,000 population equivalent will need to achieve phosphorus removal down to the technically achievable limit, which is not possible through those wetland solutions. In our example at Cromhall, that wetland is serving a sewage treatment works for 2,000 people and it works effectively, but it is a hectare of land to deliver that. If you are talking about large sewage treatment works trying to achieve the technically achievable limit, that is a real barrier to nature-based solutions.

Sarah Jenner: Some other things are potential barriers. If you go back to nature-based solutions delivering multiple benefits to multiple parties, it is about identifying the right partnership opportunities and bringing co-funding to the table so that those multiple benefits can be delivered.

At the moment in England, as it stands there is no single body at the centre of a geography co-ordinating and planning across the catchment and aligning interests. There are quite interesting developments in Greater Manchester in the north-west where we are working with the combined authority and the Environment Agency in the development of an integrated water management plan, which I am quite optimistic will help us to start to see much more broadly opportunities for the alignment of objectives so that we can start to deliver something quite different. For example, when new cycle lanes are put in, they will have sustainable drainage embedded in them. Those sorts of opportunities are routinely missed at the moment. If we leave nature-based solutions to be driven solely by water companies, we will miss a lot of opportunities. That integrational alignment is vital.

Another thing is creating flexibility for water companies so that they can be agile enough to align with partners' interests when the opportunity is right to co-invest to deliver schemes. That is particularly important in an urban area when it comes to sustainable drainage. We are working on that at the moment.

The Environment Agency and Ofwat have a joint initiative where they have given water companies the opportunity to propose an advanced water industry national environment programme, or WINEP. That is asking us to come up with how we might create the flexibility to enable much broader delivery of wider environmental outcomes, recognising that there are constraints in the existing process where being fixed about named geography and named timescales makes it hard for us to be agile and work with partner organisations. That is a real focus area. There are the beginnings of some interesting movements in that field, but it needs to be seen through in relation to creating that agility.

Q24 **Viscount Chandos:** Picking up on Lord Hollick's suggestion that maybe this is an orphan area, how much are the barriers internal to the companies, and how much are they external to the regulator and getting the partnerships that you have described together?

Sarah Jenner: One key thing is confidence. We all run with that confidence. We have driven some innovative projects quite heavily. The first flexible catchment permits in the Petteril catchment in Cumbria have been quite successful. That has driven delivery of significantly greater benefits than we anticipated, but it took a lot of energy to get to that point. We have now written a guide to share with the industry to enable others to get there more quickly.

However, the levelling-up Bill means that we now cannot take that very far. Having that confidence about the government ambition is helpful to us to know where to put our energy when driving nature-based solutions. We are absolutely keen. United Utilities is currently leading an Ofwat innovation project that specifically looks at how we break down some of these barriers, how we align interests and get those plans more joined up, how we bring to bear co-investment. That is often what is needed to get these off the ground.

We have been heavily involved in a project in the Wyre Catchment up in Lancashire, where we have worked with organisations such as the Rivers Trust to get off the ground effectively co-investment in natural flood risk management. The Wyre Catchment suffers from a lot of flood risk, but no one organisation can make the business case to invest. It was only when we started to align ourselves with the Environment Agency, insurers such as Flood Re and so on, that we started to build the case to invest. In that area, a community interest company has been set up to deliver that investment, and we are basically making an ongoing payment into that for the benefits that we will receive from that, as will other parties. Innovative things like that are potentially needed to get projects off the ground that look inherently sensible but have not progressed because individual organisations cannot make them work.

Q25 Lord Cromwell: First, I should mention that I am a director of a farming company that is in HLS and has river frontage. Having done that, can you give us a flavour of how much of this is on land that you own and control? Trying to organise a catchment of 50 different holdings is quite tricky. On your own land or with a single tenant is much easier.

Secondly, Defra and the RPA have a whole range of incentives out there for biodiversity. I have always had the impression that the water company things and what goes on with ELMS, Defra and HLS are very much two separate beasts. I hope you can prove me wrong.

Thirdly, you keep mentioning this investment. What are they actually investing in? What are they doing in the project you mentioned at the end?

Sarah Jenner: They are delivering natural flood risk management. Do you want me to explain that further?

Lord Cromwell: Is that damming rivers?

Sarah Jenner: Yes, effectively. It is using natural materials to dam rivers, or at least partially to dam them, to hold the water back so that

the catchment retains a lot more of that flow. That benefits flood risk and it also potentially gives more resilience to that catchment in times of dry weather, because more of it is held back in the land, and it improves biodiversity. You have those multiple benefits as well as the fact that flood risk benefit potentially accrues to multiple parties and organisations.

Lord Cromwell: That is helpful. On to Defra and the joined-up bit. Do you want to have a go at that one?

Ruth Barden: You have two water companies with slightly different models here. Certainly Wessex Water is not a large landowner. All our work in Poole Harbour is on land that we do not own. There, we are typically engaging with 200-plus farmers to work with them to understand how we can deliver our common aims. The issues in Poole Harbour are eutrophication and nitrate levels in the harbour itself. It is a groundwater-fed catchment. The management of the land directly impacting the quality of the groundwater below it, admittedly over decades. We are working with farmers to innovate to understand how they can maintain their cost margins and their productivity while cutting back on some of the agricultural fertilisers in particular that they are using in order to ensure that that is being retained by the crop and not being lost to the groundwater.

There are also complementary schemes working with agri-environment schemes, whereby we can provide education and understanding to encourage and provide farm advice. We also have about 10 agronomists who work in Wessex Water primarily in that catchment to provide advice to farmers such that they can make the right decisions that fit in with their farm business plan to maintain their profit levels while still achieving those environmental benefits. Where they are reducing their nitrate leaching levels but it is in our or their interest to promote biodiversity as part of it, we are looking for complementary measures such as cover crops and, instead of just having grass buffer strips, having buffer strips with pollinator strips and nectar-rich plants. Again, it is about working with them in some of the application of the fertilisers, doing sprayer calibrations to make sure the equipment works well and things like that. They are very complementary.

Lord Cromwell: I am sorry to pursue this, but is that something the water company is doing? It is very much HLS territory.

Ruth Barden: Yes.

Lord Cromwell: Are farmers receiving a payment from the water company for doing this?

Ruth Barden: We are understanding what opportunity there is for farmers to deliver things themselves and gain public funding incentives to do that, and how we can maximise anything on top of that. There is an element of layering up. We are strict about not paying for anything that they should be doing anyway or that they can get additional funding for. We are looking for the icing on the top.

Q26 Baroness McGregor-Smith: Do you think the Government and the regulators, including Ofwat and Defra, should be doing more to encourage the use of nature-based solutions? If we take PR24 as an example, do you see that there is enough in that that is supportive of what you do with incentives as opposed to disincentives?

Ruth Barden: Again, there may be some slight differences here between companies. From Wessex Water's perspective, we are finding it challenging in PR24 to deliver the catchment and nature-based ambitions that we would like to do. WINEP is still being developed. At the moment, we are looking at about 9% of the 1,400 lines that are currently in that being targeted away from asset solutions, such as investigations, catchment approaches or biodiversity measures.

That is partly because, although the headlines and the policy statements are outcomes-based, the nature of the WINEP is still very much based on outputs and a lot of the guidance is a bit constraining. The Environment Act, for example, allows for the treatment of storm overflows. In the Wessex Water area, we have a high number of storm overflows that are influenced by groundwater infiltration. Essentially, groundwater is getting into the public and the private sewerage network, causing those overflows to operate for a long period of time. It is virtually impossible to seal the entire network because we do not own it—we do not have access to do that—or to build sufficient storage tanks that you could then hold back the aquifer such that that overflow does not operate.

We believe that the best solution for both the environment and the customers is to install nature-based solutions to treat those overflows. That is permitted in the Environment Act, but the PR24 WINEP guidance does not allow the treatment of storm overflows. There are five drivers there. One is for investigations, one is for screening of storm overflows, and the other three are about providing attenuation to reduce spill frequency. There is nothing there about treatment.

Baroness McGregor-Smith: Do you have the opportunity, though, to put in a non-compliant PR24 bid?

Ruth Barden: We do, and recently our CEO has spoken to his counterparts in Defra, Environment Agency and Ofwat to seek the opportunity to address storm overflows differently as part of our bid.

Baroness McGregor-Smith: Why did they not focus more on nature-based solutions in the guidance?

Ruth Barden: There is probably a perceived lack of evidence base that supports these. You are talking about nature-based solutions, which are biological systems, so you do not have the same robustness and rigour that you might have from a mechanical and chemical solution to deliver a permit. There is possibly a bit of nervousness or hesitation there. That does not fit so well with an outputs approach, but it does fit with outcomes, particularly if you value the wider benefits that can generate.

Sarah Jenner: On whether there are barriers, there will definitely be an increase in nature-based solutions in PR24, but the regulators know that there is more to be done. That is partly why they have put this advanced WINEP out there. Also, in the Ofwat innovation project that we are leading, the regulators want to work closely with it because they know that we all have to work together to find a solution. A solution that is completely designed by the regulator will probably not be right, and likewise with the water company. I think it is recognised by all parties that there is more to do to unlock nature-based solutions and that we are on a journey. We are starting that journey and we are scaling up, but there is definitely further to go on some of the barriers that I have mentioned, such as aligning planning, enabling that co-investment, getting that confidence in the nature-based solutions, and even simple things such as the monitoring regime.

We have looked at catchment nutrient balancing in the past where the monitoring cost has not made it cost effective. We have worked closely with the Environment Agency and have managed to reduce some of those monitoring costs, but even on some of the finer details such as monitoring the benefits you have to be careful not to kill the project by doing that. Nature-based solutions deliver multiple benefits, so people want to measure them all, and that is when you can suddenly increase the cost of your project significantly. There is definitely more work to be done by all parties to scale this up, but we are moving in the right direction. I would describe it as the beginning of the journey.

Baroness McGregor-Smith: Do you think that the Government and the regulators could do more to drive the best practice that is seen across the UK and drive more for the innovative partnerships? I would have thought they have a fairly significant role in supporting that.

Sarah Jenner: Yes. That, again, is one of the things that this innovation project will look at doing—pooling all that best practice and running real-life pilots that are shared across the industry so that everybody is brought up to the same level of expertise and understanding. That is why we have written a guide on catchment nutrient balancing. It was quite painful for us to do and, having gone through that pain, it is helpful to share that learning.

Q27 **Baroness Taylor of Bolton:** I find it quite depressing in a way, because you are talking about things that have lots of potential and yet there seem to be lots of blockages to people doing what is perhaps the obvious way forward. I think you have answered this question about too many bodies and plans, too many hoops that you have to go through and too many hurdles to go over in order to make real progress.

Following on from what Baroness McGregor-Smith said, who should take a lead and grasp this and push this forward? I gather that the National Infrastructure Commission's recommendations were for more joint working and properly costed plans between water companies and local authorities. That is all very well in theory, but there has to be a step change. It is not good enough just to leave it almost to good luck as to

whether the right people get together to get the integrated alignment that you were talking about. It almost sounds as if it is partly cultural, but there is no proper leadership or a coherent approach that would bring significant benefits.

Sarah Jenner: There is definitely a lot of work going on through the catchment-based approach, but if we want to see scale-up and ambition, particularly in the urban setting where there is a huge amount of change and constant investment going on in an urban setting, optimising that needs a different approach. The recent trailblazer devolution deal for Greater Manchester, which sets out a role for the combined authority as a test bed for integrated water management planning, is helpful in that context. I am optimistic about that. I think that will help us to make big steps forward in this area. That is what is needed—a body to bring the parties together and to create that governance within a geography.

Baroness McGregor-Smith: That is dependent on the individual players and a bit potluck in who gets together and pushes things. Is that fair?

Sarah Jenner: I guess that if piloting an approach is successful, that might become more widespread. We do not routinely and uniformly have the guiding mind and the governance within a geography to bring that alignment at the moment, which is a gap.

Baroness McGregor-Smith: Do you have any thoughts on what the National Infrastructure Commission has said about the way forward in this? Do you think it is realistic to expect the kind of co-operation that it was talking about?

Sarah Jenner: Joint plans are potentially worth while. We also have to look beneath the surface into every organisation's remit and capability to invest in the same scale in line with their risks and issues. The planning is one element, but it is enabling all parties also to invest in the goods that nature-based solutions deliver. That will be key, as will making sure that the local authorities have the capacity and so on to play a part.

Ruth Barden: The drainage and wastewater management plans have recently been published. Producing 25-year long-term plans on the drainage elements and flooding is a first for the water industry. They open the door to partnership working, co-designing, co-delivering and co-funding some of these projects. From our experience, we are keen to work with our local authorities, and we have good relationships with them here. There are issues to do with a mismatch of funding, a mismatch of timing of funding and the resources available in those organisations to do that, but there is very much the will to recognise that there is a common direction here and to enable that to work. This is the first iteration of drainage and wastewater management plans, so again, over time, that will improve and those mechanisms will become more apparent and probably more trusted across the different organisations to enable them to deliver more wholly.

Q28 **Baroness Taylor of Bolton:** This is a slightly side issue, but will we

make real progress on the outcome/outputs argument? This is something we looked at previously. I think we were pretty convinced.

Ruth Barden: My view, and I think the view of Wessex Water, is that we are in favour of outcomes-based environmental regulation. It is something we have pursued for a number of years now and we are having ongoing conversations with Defra, Ofwat and the Environment Agency to pursue that. There are some issues, certainly given the public scrutiny of water companies at the moment, that outcomes seem to be possibly letting water companies off the hook and therefore output is the way to control delivery of options there.

I think we would favour outcomes going forward, because it enables different organisations to work together to deliver the right solutions for the environment and society, looking more holistically and understanding that each catchment is different. There are different challenges, different issues, different partners working there, so there are different opportunities. That is what we need to recognise to deliver the change that we all want at the moment.

Q29 **Lord Reay:** Nature-based solutions tend to require a longer-term timeframe than the five-year regulatory cycle to generate results. How much of a problem is that, and how can water companies be encouraged and supported to take the long view?

Sarah Jenner: Some nature-based solutions do take a long time to mature. I will go back to peatland restoration, which goes through many stages before it eventually reaches maturity, going from bare peat to a fully functioning peat bog that is acting as we want it to. In reality, a lot of nature-based solutions deliver results quite quickly.

What takes a lot of time is aligning interests and co-funding. That can be challenging for a water company. If we know that we have overflow acts and investment is needed in the next three or four years, it can be difficult to align interest in that particular area. That is something we are working on with the regulators, proposing through the advanced WINEP approach a more flexible outcomes-based approach that allows us to invest when partners are ready. We have long-term targets for storm overflows, so we know that massive change and a huge amount of investment is needed, and we want to make sure that as much of that as is sensible goes into the nature-based solutions that deliver multiple benefits. That needs a lot of focus.

Lord Reay: Are you saying that at the moment you are only prepared to do the projects if they can be completed in a reasonably quick timeframe, because if it goes on too long it will not be commercially viable or a project that you want to take forward?

Sarah Jenner: Yes. The accountability regime in the water industry means that we have things such as price control deliverables by which we will be financially penalised for not delivering things on time, and there is also the Environment Agency's environmental performance assessment. There are significant implications from not delivering schemes on time.

That can take away some of our agility to act and work with partners to secure that nature-based solution.

You need to secure the nature-based element of the scheme to lock down the design of the grey element, because if the nature-based element does not get you all the way to your final end game in what is needed, you still have some grey to design, and that all takes time. The danger is that you lock in your design too early because you need to design your grey, so you go for lower ambition on the nature-based. That is the bit that we need to turn around, and that is why we want to be able to do the nature-based first, ahead of following in with the grey, because we need to give it a good chance.

Ruth Barden: I agree with Sarah. It is the planning that takes the time, not the nature-based solution. At Cromhall, we started talking to the landowner in 2010 about a wetland solution there. He could not have been more supportive. There was even a Defra payment for an ecosystem services project that funded looking at the outcomes of that in 2012. However, there was no driver for it in the WINEP for PR14, so it had to go in at PR19 with a construction date of 2020.¹ It was constructed in 18 months and has revealed results in that time. It just took 10 years to construct it, partly, I think, because of the alignment of objectives. In that instance, we did not need any co-funding, but the fact that there was no permitting regime for it or driver that could go in the WINEP, it missed that opportunity for five years before there was something that we could hang it off and deliver.

Q30 **Lord Reay:** On outcomes monitoring, which you touched upon earlier, how strong is your outcomes monitoring capability and what challenges and opportunities exist in that area?

Sarah Jenner: When we have delivered nature-based solutions, we have monitored the outcomes. In the Petteril Catchment, where we did catchment nutrient balancing, we demonstrated that we not only significantly outperformed on the phosphorus load production, which is what we were targeting, but delivered significant improvements in soil health and nitrogen. It delivered a lot more. We had to work closely with the Environment Agency to make sure that the monitoring regime was proportionate, because this was very much one where the cost of the monitoring was in danger of jeopardising the scheme. We learned a lot as we went along and we have honed that, but there is definitely more to do in this space.

One of the projects that we are leading at the moment in partnership with the Rivers Trust and quite a lot of other water companies is CaSTCo, which is looking at trying to find cost-effective ways to monitor the health, particularly of river systems but also potentially of the landscapes that impact those river systems. We know that monitoring is vital for a catchment-based approach and for assessing the benefit of nature-based

¹ The witness would like to clarify that she intended to refer to PR09 and PR14 respectively.

solutions, but it can be costly. Part of that is trying to find the right blend, from citizen science to high-tech online monitoring and everything in between. If we can find the best blend that gives us confidence without overmonitoring to the point where it starts to kill the business case, that is what we need to do. We have done some of that, but it is work in progress and it needs honing to make more of these viable. Those ongoing costs can become a burden to a business case for a nature-based solution.

Lord Reay: Has the EA been supportive in working with you to try to overcome these issues?

Sarah Jenner: Yes. I think we have all learned a lot from trialling this. They have worked with us. It takes courage from everybody to take a different approach and we are used to a grey solution. You usually have one point to monitor, so you can monitor that frequently. In a catchment solution, you could be monitoring many points in the catchment. In our first example we did interventions on only a few farms. In the next one it was about 12 farms. We could not scale up the monitoring in the same way because it would have caused problems with the business case, so we came up with a more pragmatic approach of monitoring key points in the catchment. We have moved forward, but every scheme is a bit different, and that is something that has to be worked through as we go forward. Everybody needs to be vigilant about this to make sure that does not become a barrier to nature-based solutions.

Ruth Barden: We have similar experiences. As you do trials, clearly you want to demonstrate that they work, so you do a lot more monitoring to be able to convince yourself and others of the effectiveness of that solution. As those trials become normalised, you can step back on the monitoring because you understand what they can deliver. There is then the opportunity to develop models. In the work we have been doing with farmers down in Dorset we have spent 10 years doing porous pot monitoring of the nitrate level below the root zone of different types of cover crops throughout the year. We have been doing that for about 10 years.

There have been probably tens of thousands of analyses undertaken on a yearly basis. That has been shared with the Environment Agency, which has developed a nitrate leaching tool based on that data. Now you can model what would be the anticipated leaching for different crops over different years and with different rainfall patterns. Then, instead of monitoring to the same degree, you are just calibrating or validating that model. We need to pool our data understanding and refine that so that we do not need to do the same level of monitoring, but we still have the confidence of the delivery of those solutions.

Q31 **Lord Burns:** You will have seen that many of our discussions have been dominated by the problem of CSOs and a litany of comment about dirty water and its impact on the rivers and beaches. We have been told about the huge cost of trying to modernise the combined sewage and stormwater system. One solution, of course, is to build huge concrete

tanks to try to hold back the water. In practical terms, what role could nature-based solutions play in helping to solve that, and is there any evidence of things that have been most effective? Can they make a significant difference?

Sarah Jenner: I believe that we need to use every tool in the box, particularly in the north-west of England where it rains a lot and we have a lot of combined sewers. Nothing is taken off the table as far as I am concerned, because we need all of it.

Tanks are sometimes the right thing to do. They are incredibly effective at dealing with the first flush from the sewer system, so they have a role, but nature-based solutions such as sustainable drainage deliver wider benefits. They can help to reduce flood risk and bring you longer-term resilience to climate change. Once you have that rainwater out of your system, it does not really matter how extensive climate change is. It is not affecting the storm overflow in the way it was. They definitely have a role to play.

The challenge in an urban context is that you sometimes need to separate out very large areas. Some of the places in the north-west of England with street upon street of Victorian terraced properties entirely combined at property level and where car parking is a nightmare will be really challenging to deal with. In suburban areas, we have more opportunity where there is more excess road space and things like that to do things differently. We will do different things everywhere we go. In developing our plan for the next price review, we found that in Cumbria there are more nature-based solutions. That is probably no surprise. There is more land there. That is easier for us to go at.

Lord Burns: Can you tell us more precisely what those solutions would be in Cumbria?

Sarah Jenner: There could be sustainable drainage where we separate that water out of the sewer system and slow the flow—some of it may still go in the sewer system—or completely separate it from the system and reroute it elsewhere to a water body. There may be a smaller element of natural flood risk management as well. Sustainable drainage systems and natural flood risk management will be the key in getting that flow out. We already have some good partnership opportunities that we are exploring up there to work with other organisations to do that, because the flood risk is so significant up there. People want that flow attenuated and held back. There are great opportunities there. In the urban areas, we have lots of work to do.

The Chair: On that note, there is a vote in the House, so we must hit the pause button for five or 10 minutes.

The committee suspended for a Division in the House.

The Chair: Welcome back. Can we resume our discussion on environmental solutions? I believe Ruth Barden was about to give us a response to the question.

Ruth Barden: Yes. That is right. The question was about the effectiveness of nature-based solutions to storm overflows. From a Wessex Water perspective, we have a slightly different geography and geology to United Utilities.

One key issue in addition to rainwater-influenced storm overflows is groundwater-influenced storm overflows. We have been doing a lot of work to understand the effectiveness of treating groundwater-influenced storm overflows through nature-based solutions. We have real examples. A particular one is at Hanging Langford, which is storm overflow. We constructed a reedbed there. It is on Wiltshire Wildlife Trust's nature reserve and it discharges into the River Wylfe, which is a SSSI, SAC and chalk stream. It has been operational for about 10 years now and we have been monitoring it over that time.

We find that the effluent into the reedbed itself would comply with a standard sewage treatment works permit because there is a lot of groundwater in there, but the reedbed itself provides a good level of treatment. Typically, we are seeing about a 50% reduction in suspended solids and an 85% reduction in E. coli and bacteria. When we have upstream and downstream monitoring of the River Wylfe around the storm overflow discharge point, we see no discernible environmental impact on phosphorus or ammonia but we see a much lower level of E. coli downstream of the storm overflow because of that level of treatment. Particularly in locations with high levels of groundwater infiltration and recreation on those rivers, this is probably a far more effective solution than if you looked to attenuate or even reline those sewers, because ultimately you would not be able to do it sufficiently to solve the problem. With this, you ensure that there is not ecological or environmental harm as a result of that overflow operation.

Lord Burns: How much scope is there? You have one example. How much wider could this go and how many more places could this be deployed in?

Ruth Barden: We are trying to get that site permitted with the Environment Agency with a numeric permit for setting quality standards for when it operates, but we have pushed ahead anyway and we are committing to delivering 28 of them by the end of 2025 in similar locations. That forms part of our business plan to tackle storm overflows. There is clearly a risk there, because that does not quite follow government guidance or Environment Agency guidance right now. There is not the permit there. We have been working hard with Defra to redress that, because, to my mind, it is the best environmental solution in those instances.

Lord Burns: Both of you described earlier some of the problems with bringing together the various participants. Does it apply to this whole area of dealing with storm overflows as well?

Sarah Jenner: Probably less so in treating them but more when you come to the sustainable drainage. That is where you have real

opportunities to deliver wider benefits for multiple parties in reducing flood risk, making cities more liveable, increasing amenity and so on, because those solutions will be in the public domain, not behind our fenced boundaries. They will be out there on the streets that people live on. It is those types of schemes in particular.

Lord Burns: You were saying that in this urban environment the flooding issue is part and parcel of—complementary to, in a sense—the issue about what follows subsequently in relation to the storm overflow. Places that are likely to be flooded or where there are flooding risks are presumably also places where you have heavy use of storm overflows.

Sarah Jenner: Yes. They vary. Greater Manchester, where we are putting quite a lot of focus, has a key issue with both, because the city is effectively in a bowl surrounded by hills on nearly three sides.

Lord Burns: That is why it exists.

Sarah Jenner: Exactly. It was there for a reason and the water was helpful in the Industrial Revolution, but it creates challenges now when we deal with storm overflows. It is exactly the sort of area where the water causes multiple challenges and we need to manage it differently, but we also have soil that is not very permeable either. We need to find other ways to manage that water in partnership.

Lord Burns: If you have other case studies of where it has been done successfully, we would be interested in hearing about them and about things that give us some basis upon which we can air these issues more widely.

Baroness Taylor of Bolton: Especially in urban areas.

Lord Cromwell: I totally agree. Use all the tools in the box. The guides and what you have learned from the experience of doing it will help more of it to be done elsewhere. Behind all this somewhere is a spreadsheet with numbers on it. It would be helpful, as Lord Burns was saying, to have case studies that directly compare a concrete-and-steel version and a nature-based version—not just of the costs but the benefits, because I appreciate that there are wider benefits in some cases. It would be helpful to the committee to have a few of those with actual numbers on them. Thank you.

Q32 **The Chair:** Who are the cheerleaders for environment solutions at Defra and Ofwat? What are their names?

Ruth Barden: At Defra, the key person we have been talking to is David Hallam. For Ofwat, I am less sure, I am afraid.

The Chair: Secondly, are any of these solutions at a size and scale that would be suitable for the special purpose vehicle approach, which we have seen with the Thames Tideway and which could be done by a separate dedicated company driving it through with all the enthusiasm that is needed to get it through?

Ruth Barden: There might be some examples in more urban areas, but in rural areas it is probably a bit trickier.

Sarah Jenner: Effectively, the Wyre natural flood risk management project was done in that way with a special purpose vehicle with multiple partners paying for the benefits that arose from it.

The Chair: What was the scale of that?

Sarah Jenner: I am trying to think of the numbers now. It is not an enormous project. It is nowhere near the scale of the Thames Tideway. We are talking about £10 million or that sort of order. It is nowhere near the scale that you would ordinarily consider going down that route for.

The Chair: Thank you very much indeed. I am sorry about the interruption, but it was interesting. If you could give us some follow-up points that have been requested, that would be most helpful. Thank you very much indeed. You will get a transcript.