**Meeting between EA/SVWMS staff and Severn/Vyrnwy confluence constituents**

**18th March 2021 at 4:30pm via Zoom (follow up to meeting on 26 January 2021)**

**Attendees:**

EA staff:

Jason Walker (SVWMS Public Liaison Officer)

Imke Goalby (Engagement Specialist for EA, supporting JW on the project)

Paul Jones (Senior User concentrating on technical side of SVWMS, chartered engineer)

Mike Adams (Appraisals Expert, Strategic Senior User on SVWMS secondment to EA from Jacobs)

David Preston (Water Transfer Programme Manager for the West Midlands, with a small team)

Lizzie Quarmby (the hydrologist on DP’s team)

Kinnerley PC - Nick Barclay, Lorraine Jones, Charles Green

Melverley PC - Rosy Harding (also Melverley Flood Action Group and Save our Severn)

Lucy Roberts (Powys CC Councillor for Llandrinio)

George Whitworth (ex Powysland IDB, and user of 2-D catchment modelling)

**Notes of meeting:** these notes are largely a transcript of recordings of the meeting, but include some summarisations, and some annotations in square brackets

1. **Preamble** (about 2 mins): **JW** said that the purpose of the meeting is to sum up everything that has gone on in the last couple of months, and Charles raised a number of questions coming out of the meeting with Owen Paterson, emails back and forth around Clywedog and Vyrnwy. Lizzie is on the call and Dave Preston is there as well from our Water Transfer team, so questions about that can be answered as well. Paul will do a really quick presentation to make sure we’re all on the same page, the same level of understanding about where we’re at with the project *[the meeting was offered by EA as a follow-up to the meeting on 26 January arranged by Owen Paterson with Clare Dinnis and Adam Lines of the EA]*
2. **Brief introductions** (about 8 mins); LJ and RH emphasised the effect on local houses, cut off for days at a time, things are becoming worse and floods are coming faster and the impact from incoming streams other than the Severn, particularly the Vyrnwy and the Morda Brook which massively affect Melverley and Edgerley and how the EA are managing those.
3. **Presentation given by Paul Jones** (about 12 mins) [the presentation was an update on catchment-wide presentations we had seen before in various versions].

The prime purpose of this presentation is the Severn Valley Water Management Scheme (SVWMS), which is a catchment-wide scheme. Within this presentation we won’t be drilling down to the level of detail (Morda Brook etc mentioned by Rosy) but I hope you’ll get the theme of what we’re trying to achieve.

The scheme as it evolved was initiated back in 2009 with the perceived opportunity to combine two pieces of infrastructure, the North West Relief Road (NWRR) and the potential for a flow control at that location to control downstream flooding and flows on the Severn. At the time it was looked at and found to be technically feasible, with a few caveats. One was that there would be increased depth of water upstream and there would be a need to look at mitigating that together with the upstream community. The scheme did not go ahead then because it was thought to be viable only if the NWRR and the flow control went ahead together and funding for the NWRR was withdrawn.

The NWRR started to come back on the agenda in 2019/20 and received funding, so EA took the opportunity to have another look at whether this form of flood scheme was viable, in combination with the NWRR. We did quite a lot of work on this, as shown in the slide, initially we looked at high level modelling assessments to determine benefits and we considered at that time that we could benefit around 3,000 homes and 1,000 businesses going downstream. There would have needed to have been some amendments to the alignment of the road to make it viable, so we had twin-tracked studies looking at the flow control and we looked at combined schemes, practical constraints, upstream impacts, engineering assessment and the planning and legal side of the scheme which were all fundamentally according to plan. We took what we’d done in 2009 and we extended it and looked at it in more depth. We looked at developing a business case with a long list assessment of various options to consider, ultimately whether combining with the road was the best option to manage flood risk going forward.

The interim findings (see the relevant slide) were that the engineering was feasible, ground conditions were difficult, and potentially costly. There would have been impact on local water supplies, we believed, so that would need to be studied in further detail. Planning and legal constraints were looked at and assessed in line with whether we could we tie in the programme for the road in line with planning approvals, and also the upstream impacts. In all of that, we quickly covered the engineering, that was fairly extensively done, cost estimates were looked at, but the engineering also involved a more detailed look at what was then a dam structure, which started to get quite complicated, quite costly. Ground conditions were something that would need further investigation but at that stage we’d got to were essentially classed as a constraint. The upstream impacts on surrounding properties, increased water levels and then again environmental mitigation, all of which took us at this stage to say that this scheme was probably not the best one to look at in isolation. We also received some questions from the public saying well actually you have only gone ahead with one scheme, we need to look at a wider range of schemes please. So we’ve parked this idea for the moment.

We’ve decided to take the more catchment based approach looking at how we can manage or control flooding in the Severn Valley. This is going to take the form of a wider catchment scale programme, working with various partners across the Severn Valley and the Upper Severn catchment, those being farmers, landowners, various Local Authorities, the EA and Natural Resources Wales (NRW). This project doesn’t stop at the border, it is a catchment based project. We will be looking at risk management, storage, reservoir operation in the round, largely with, and through the River Severn Partnership (RSP). The scheme, although being led by the EA, is under the umbrella of the RSP, which gives us the advantage of unlocking partners along the Severn who have an interest in what we’re doing, funding and schemes that benefit what we’re doing as we move forward. The initial development of this part of the programme is likely to take until somewhere near the beginning of 2022, when we get to a stage where we think we will have a range of options that we can take forward in more detail. We are starting the engagement process now, engaging with not only local partners, but also Local Authorities, Parish Councils, to find out what the problems are in your area, where flooding occurs, what your concerns are. It’s not often flagged up, we’re talking about a catchment scale approach, you’re talking about the detail of Melverley and the Morda Brook, the overall catchment area upstream of Welsh Bridge is something like 2,300 sq km [other figures from EA indicate 2,030 sq km to Montford]. The peak flows that we are initially trying to address have been modelled in excess of 700 cu m per second (700 cumec). So when we’re trying to reduce flooding we’re trying to reduce it from that high level down to about 3,500 cu m [PJ meant to say 350 cumec], that’s around 19 olympic-size swimming pools per minute at that point [an olympic pool is 50m x 25m x 2m = 2,500 cu m, so 19 = 47,500 = 792 cumec].

So we are at the beginning of a very detailed study. We will be looking at land management to see what impact that can have on downstream flooding, Natural Flood Management (NRM), which will include dams and improvements to planting, as well as hard engineered storage where it is needed. We don’t know the value that each approach can give to the overall result yet, we are right at the beginning of this journey. Over the coming months and years we’ll be able to reveal more about that.

The arrow shows we are here [Step 0], we’re developing the catchment vision, the programme identifying what we need to do and what the impacts of what we want to try to do on the overall reduction of flooding in the catchment. We’ve got a few other stages to go through. Step 1 outlines the Strategic Case, this is all part of the EA’s project development process. Step 4, construction may well be a series of detention basins or an ongoing program of improvement to land management, installation of Natural Flood Management processes which could take a period of time but we’re looking to start that work somewhere around 2027, but don’t hold me up to that. We’ve got a long way to go, we have a lot of investigation to undertake and a lot of approvals to obtain as well. The timeline is likely to extend but this is the best we’ve got at the moment.

Afterwards please raise your questions with us all. Jason is quite happy to field questions at any time.

1. **Questions** (about 1 hr 11 mins); these were taken as they arose, without imposing any structure, for instance as in the suggested agenda at the end of these notes, which was offered ahead of the meeting.
2. **GW**: Question about peak flows and the target. **PJ** Confirmed that the current analysis of the catchment indicated that the peak flow we’ll be dealing with is around 700 cumec. Don’t take what I’m saying now as being absolute, because as we develop a greater understanding of the catchment and the modelling is further refined those figures could well change. Target is to bring it down to around 350 cumec.
3. **LR**: I heard a presentation last week at the Catchment Based Approach meeting and it was very useful. As the representative from Wales, how do you square the fact that the majority of the work will need to be done in Wales, but the financial benefit is almost all in England? How do you cross that bridge? **PJ**: We’ll be trying to identify, and looking to gain, benefits across the whole catchment, but can’t give the definitive answer until we’re much further down the line. **MA**: Conversations are ongoing between EA, RSP, NRW to understand some of those linkages and to understand what benefits NRW might be seeking to achieve on the other side of the border, so that we can start to build that into our thinking. There are also parallel conversations with legal colleagues and treasury around how we can distribute that funding recognising that many of the benefits will be in England but ensuring that we have an equitable share of funding across the whole area and that Wales can seek some of those benefits as well. **PJ:** It’s not just a Wales England thing. Wherever people are in the catchment they will be asking the same sort of question and we’ll be trying to address that across the catchment area. **LR:** Represents a particular patch, like Melverley, but a lot of the work will be higher up the catchment, nobody is representing them, so I need to be thinking about that too. **PJ:** As part of the engagement process we will be asking where do you flood. We know so much from our flood mapping. **GW:** The confluence area defended zones (e.g. Pool Quay/Criggion/Llandrinio) would benefit from upstream catchment works that will eventually benefit Shrewsbury and everybody downstream. Broadly, if Pool Quay doesn’t overspill and is dry, then Shrewsbury will be dry and to some extent Melverley will be dry, or drier. There would be benefit for Wales. **PJ**: We’re also looking to find out not only the benefits but what are the problems in Wales that we can address. That’s part of the dialogue with NRW.
4. **CG**: Question about where the peak flows are; 700 cumec cannot get through Montford, that’s why we flood. **PJ**: The 700 cumec is the design flow. The flows experienced from flooding recently in 2020 and 2019 didn’t exceed a 1 in 20 year flood event. For our design, we’re looking at a much greater event, 1 in 100 year event, which are much higher than have been experienced recently. At the moment, the design figure that we’re looking at is in excess of 700cumec. We want to be able to reduce that, by managing the catchment, to something like 300-350cumec, if we can. All this is very much, if we can. But the figures we’re talking about are not the flows that you experienced recently, they’re much higher than that.
5. **CG**: Clarification on what stage we’re at: I think that what you’re saying is that up to now the EA/RSP/SVWMS has only been talking about the dam at Shrewsbury. This is probably about the seventh presentation I’ve witnessed on similar lines, so we’ve been having engagement all along. But I think what you’re saying is that that engagement from Mark Barrow, Adam Lines has all been aimed at when you were still at the stage of the dam being your only consideration and you’re now saying that you’ve moved to a holistic approach to the catchment, which I thought you were on all along. The RSP gives out that it’s always been holistic. So I’m just surprised you’re not further down the road of getting towards your Strategic Outline Case. You say you’re only at the start of a journey. **MA**: The key thing with the NWRR is that there was a piece of infrastructure being developed that was going to go across the river Severn. What we wanted to make sure we didn’t do was miss an opportunity to achieve huge flood risk benefits, whilst also making massive savings to the public purse, so it was really about pursuing an opportunity that was very much time limited. It was not closing off to all of the other options, but focussing on that one initially because that is where the main time constraint was, whilst always recognising that we needed to have full consideration of all those other options. The element that's changed is that recognition that it isn’t just going to be about a handful of different flood risk management engineering interventions, this is about a whole patchwork of measures including land use management change, implementation of NFM on a very wide scale, looking at existing management regimes for certain assets as well as some of those more hard engineered type solutions across the catchment. This has always been part of our thinking, it’s just that initially we were reacting to that opportunity to ensure we didn’t miss it. **CG:** That was part of the message that I got. The fact that the NWRR came up got you out in the public before you were really ready to go. I got the impression that things weren’t quite as well organised as they might have been.
6. **CG**: The other thing that worried me, Paul, was you said you wanted us to tell you where we flood. We thought the EA knew where the floods were, and that you included that in your modelling. **PJ**: Can I be specific on that? It’s one thing for us to have plans and data that show where flooding is that we’ve got from reports we receive. It’s even more useful when we approach you and you tell us, well actually I do get flooded, and I get flooded in these circumstances. You can add the detail that we may not in all cases have. We know a lot, and we have got a lot of information, but we don’t know it all. We don’t want to go down the line of a particular approach to dealing with flooding, then find out that there is information out there that people know about that we aren’t aware of. **MA**: We do have detailed hydraulic models of this area, that do include detailed survey of the areas, and have gone through substantial hydrological modelling to get inflows and have then been tested, calibrated and verified against past events, so we do have a good idea of flood risk in the catchment, but it’s some of those more local nuances that we need to make sure we’ve captured. If there are multiple sources of flooding, overland surface water flow routes that are really integral, sewer flooding, small structures that haven’t been picked up in the catchment scale modelling, then it’s those sorts of detail we need to ensure we’re capturing. And we also need to understand what ‘good’ means for people; is it taking the water away, is it managing it at certain locations. We need to make sure that our thinking is aligned with what would actually make a difference to people on the ground and in these communities.
7. **GW**: Can I ask if you’ve got a 2-D model of the entire 2,000 sq km Severn/Vyrnwy catchment? **MA**: You can ask. What we’ve got, in terms of the River Severn model, from the Severn/Vyrnwy confluence downstream, we’ve got detailed 1-D/2-D linked flood model approach two flow model that extends down to Buildwas. We’ve then got a 1-D only model from Buildwas downstream, currently being updated and modified, so that will also be a 1-D/2-D linked model. We’ve then got a 2-D model for the Vyrnwy confluence section and we’re currently liaising with NRW to understand the detailed modelling that they have further up into the catchment. **GW:** Does anyone have a 2-D model of the Severn catchment and probably a separate 2-D model of the Vyrnwy catchment? **MA**: As just described, we do have those 2-D models of the Severn catchment and the Vyrnwy catchment, but sections of those right at the top of the catchment are covered by models that NRW hold, which we don’t currently have access to and that’s why we’re liaising with NRW to obtain those. There isn’t a single model of the entire catchment, it’s chopped off into sections. Running a 2-D model for 2,000 sq km at the sort of resolution that we need to have a good indication of flood risk would take days if not weeks. **GW**: I would question that. **MA**: I am more than happy to have a more detailed conversation outside this meeting.
8. **CG**: Another one, for Mike and Paul, from the list sent beforehand: this meeting is an update from the meeting on 26 January, just after the January 2021 floods [storm Christoph]; on asking Clare Dinnis whether the modelling correctly modelled those floods she seemed to say that history couldn’t be relied on to predict what’s going on now – she said that the performance of the river system has changed; you implied you had tested your model against reality. **MA**: For any hydraulic model that the EA commissions and builds, where there is data available, gauge data, flow/level relationship, rainfall data, we will generally calibrate that against large scale events. So we’ll check that the relationship we’re seeing at the gauge locations is being mimicked in our hydraulic model when we run through those previous events. And we also check that where we’re seeing flood events they align with the model. That does happen, it’s quite an involved process to go through, it’s not a quick and simple exercise. Clare may have been thinking of when we start to look at optioneering and designing flood defence schemes for the future, we don’t necessarily design them against an event that’s happened in the past, we design them against future predicted events, so that we can take into account the impact of things like climate change and that some of the events we’re designing to are far greater than those you may have seen previously**. PJ**: I come back to the point I was making earlier about the numbers that I’ve given you. They are the design figures. Your previous events that you’re worried about were much lower events than that. **CG:** I’ve got a better understanding now. Thank you both.
9. **DP**: It’s the only chance I get to ask questions. Just picking up on the comments around options in England and Wales. We’re talking a lot about the high flow end. The work that my team does is also a lot around the low flow end. We do a lot of work with Water Resources West (WRW) to look at that limit side, with how it joins up with the higher flow end. WRW are working with RSP, thinking about water management holistically, that also links to potential options in England and Wales, particularly through NFM, sustainable management and natural resources. Potentially there are some restrictions about what we can do here but on the other side of the coin through the water resources picture, that can also open up similar opportunities, holding the water in the catchment and balancing some of these flow issues.

**JW**: I wanted to pick up on that definition between EA, RSP and SVWMS. It’s true that the RSP was taking a holistic approach, also looking at the Warwickshire Avon, the top of the Wye. Our SVWMS project team, which are here, are now looking at a more holistic project as opposed to what we were looking at tying something in with the NWRR. That wasn’t the end game, that was an idea. When I mentioned to you we were looking at a more holistic approach now, what Paul was talking about. The RSP sits above us, because it can access far reaching Government funding rules as opposed to us being able to fund anything on our own. It is complicated and it’s a complicated relationship. **MA:** In essence the RSP is just a group of influential organisations across the Severn catchment, of which we [SVWMS] are one. The advantage of the RSP is that it offers us a huge number of opportunities that as individual organisations we wouldn’t be able to pursue, which might be around funding, delivery, and also about giving us the political backing to pursue an agenda that is very much about the whole and trying to take on that enhanced place-shaping type work as opposed to just focussing on the specific outcomes or elements that an organisation is measured against.

1. **CG:** Having said that, you here on the call today, are all paid by the EA, aren’t you, not RSP or SVWMS? You’re EA employees, sort of seconded to the SVWMS, just to get the hierarchy straight? **JW**: Yes. The SVWMS is just the name of a project. Then you’ve got the RSP which is a collection of organisations. It doesn’t have to exist as an entity or a business. It’s all about unlocking the opportunities as well as the funding calculation. The more people and benefits you’ve got, the higher score you get on that Government funding calculation, the higher chance you’ve got of actually getting the scheme out at the end of the day. I think that succinctly summarises it, Mike? **MA**: Pretty much, yes. I could talk about partnership funding all day. **CG**: Just one more supplementary on that. You might not be on the RSP but it does put out some fairly hairy financial figures. For instance the claim for billions of pounds of benefit was partly based on the huge amounts of agricultural land, subject to periodic flooding, that were going to be released being currently valueless. It was applying an uplift to that land of something like [£9,000 an acre]. Do you have any influence on how RSP put out their figures in order to get their funding from Government? **PJ**: It would be fair to say that we didn’t have much influence on that document. **MA:** There is a recognition that in terms of that initial prospectus, there were a number of assumptions that were built into that, which were outlined in more detail in the reports that sit behind it. That prospectus was almost used as a promotional tool with Government to seek some interest in terms of what the Partnership were doing. You would be able to pull the figures apart. There is a recognition that more detailed analysis needs to happen around that to understand what that benefits picture will look like. It was more about demonstrating the potential scale rather than the specific detail. And to a certain extent it’s helped because we’re here talking around a potential investment in the Severn catchment and trying to make that work for the communities that sit in that catchment. There’s pros and cons and a recognition that that benefits picture needs to be understood in more detail as we move forward. The background is on line now. **CG**: Only because I put in a Freedom of Information request which took months to deal with through the EA’s inordinately bureaucratic system. But you guys are sounding more approachable, which is good.
2. **RH:** The slide showing 2027, which I’m not going to hold you to, is for delivering some hard engineering scheme. My massive concern and the concern of Melverley in general, is the way things have gone just over the past few years, we can’t wait until 2027 to get anywhere, we’ll be under water by then. In the meantime, if we’re looking at various other options and coming up with lots of fantastic holistic management ideas, are they going to be implemented as we go or are we going to have to wait until the end of this umbrella, because there are quite a few residents saying we can’t go on like this. **PJ:** There are two answers to that. One is that we work out what we’re going to do and just start in 2027, or we can implement elements of the scheme as we go along if they’re being undertaken by partners. You may find that some work is being undertaken by partners and may already be started. But what we won’t know until we develop a greater understanding of the options and the overall concept of the scheme is how they will influence different parts of the catchment. There may be partners working in the Upper Severn that will have an impact, through NFM or change of farming practices that will influence locally in that area but may not impact further downstream for instance Melverley. We can’t at this stage say, but it is potentially likely that there will be things going ahead in parallel, but they won’t be run by the EA, they’ll be run by partners working within the scope of the RSP. We as the SVWMS will be able to use the outputs in terms of overall flood reduction. Does that answer the question? **RH**: Yes, in theory.We in Melverley, and Kinnerley too, have our fingers in various pies, and I’m sure you have too, to try and improve things on a more immediate basis for our area. There are a couple of things we’re desperate for, to get people out here. Our local farmers, for example, are desperate to start doing things locally to help mitigate our current situation, it’s just getting the advice on actually what on earth they’re supposed to do, because they don’t know which tree planting and which field is going to have the biggest impact. We’re all desperate to crack on here. Things in the meantime that we’re doing are we going to be rendering complications further down the line with anything that you’re then trying to do with your scheme, not that anything we’re going to do is going to have huge impact. Actually, our dream in Melverley is to get our argaes moved. They were put somewhere where they were really good there about thirty years ago but things are completely different now, and we need to shift them. That’s something that we’re definitely trying to do. Does that come under your umbrella or do we carry on going on a parallel scheme, essentially they are EA owned assets. **MA**: The important thing is that we’re all sighted on what each other are doing. You can’t just go and dig out flood defences, especially if they are EA owned, without getting the necessary environmental permits because someone will come and tell you off. We need to know what it is you’re looking at. What we can start to do, if there are specific things you’re thinking of locally, we can start to build that into our thinking as we’re developing this plan. There’s nothing wrong with that but it needs to be within reason. There are broad ideas we can start to look at as we’re developing our plan. The thing that we’ll also be doing as we start to understand what these options are is working really closely with a whole group of different partners, and that includes people like NFU and CLA so that we can start to make sure that our plans are set in the context of reality, and they are deliverable for people which is a really important part and something that’s been missed previously. In terms of that 2027 deadline that’s all around the Government six-year investment programme for flood defences. It starts on 1 April this year and then it runs to the end of March 2027. All of the funding is within that six-year capital investment period, which is why we’re setting that as our date. That doesn’t mean that we necessarily will have everything built by then, but that’s at the moment where the funding sits for this. As we develop that programme we’ll start to understand how we might be able to phase that and how we work with partners to enable some of that phasing. We’re talking about the big bucks stuff, so drawing down those big Grant in Aid sums from Treasury we need to have the benefits and business cases signed off in order to pull that down. In terms of immediate deliverables, it’s us supporting you to understand what you can do locally and also delivering as much as we can through partners when there’s more flexibility with funding as we develop the longer term bigger spend type stuff that will need more rigorous input and analysis. **RH:** Thank you, that was really helpful.
3. **GW:** The “What’s next” slide (also at the Kinnerley meeting) mentioned possibilities for mitigation of flooding and NFM, land use and reservoir management broadly. If you do the maths on a reduction of 350cumec it’s about 1million cu m an hour. A flood lasts different durations in different points of the catchment, but if you took 12 hours, you’re talking somewhere in the region of 12 million cu m. What proportion of that sort of amount of grab of flood water do you think will be achievable with NFM, land use management and reservoir re-management? The emphasis in recent years has been on NFM and my difficulty is I just can’t see how it’s going to come anywhere near the number of cubic metres that are needed to achieve the target that you’ve talked about. **PJ:** You are right George. At this stage our answer is, we don’t know. We’re commissioning a study to try to identify what proportion of the overall flows in the catchment can be reduced by the respective elements that we’ve just talked about. That will then inform the strategy of how much we can deal with by NFM and LUM and where we can change it. At this stage I can’t give you that answer, it’s far too early in the process. You’re right, they are big numbers to play with. **MA:** Just to add to that, you are entirely right. NFM and LUM change are not the answer, but they are potentially part of that answer. There will be a need for engineering at a large scale as part of this. What we’re trying to do is understand to what degree we need to do that engineering and how much of that volume is left. **GW:** It seems so often that the default solution is the concept of NFM, so often NFM is majored, when realistically there is no way that NFM will come anywhere near the volumes of mitigation work that is going to be required. I think that’s misleading. NFM is put forward, but there’s no backing in science and calculations that it will ever get there. **PJ**: We have to emphasise that it’s only being considered as a component of the overall solution. How large that component is, we don’t know. We will have to justify whatever we do. **GW:** But everybody knows that NFM is never going to get anywhere near 1 million cu m an hour, but other schemes would, and yet they’re not mentioned. **MA:** I think the key thing here is that that assertion that everybody knows that NFM won’t do it, I’m not sure everyone does, and that’s the question we have to answer in order to move people along that journey towards understanding what might be able to manage those sorts of volumes. No-one has really looked, at scale, in terms of what NFM could achieve. Tons and tons of pilots have been done across the country at varying different scales. What we need to understand with the backing and the opportunity we’ve got with partners is what percentage that would take. I think you’re right, it would be a very small percentage, but we need to demonstrate that for a whole variety of purposes, mainly because lots of different partners and lots of different people have been asking us that question. The same with LUM. I think you’re right, I suppose the reason that the other options aren’t listed (they have been on some presentations we’ve given) is we don’t know the specifics around those other options. We have talked about flood storage areas, reservoirs, linear defences, conveyance improvements, NFM, LUM; there will be a whole variety of things that come together to give us the answer, and at the moment we’re trying to work out what percentage of that total volume each of those things will help us manage. **GW:** I can’t see how you can do those calculations without a 2-D catchment hydraulic model. I did it myself 8-10 years ago and it’s not that difficult. **MA**: There’s varying different ways we can do it. Initially we may not need a hydraulic model to do it at all. We can probably do a series of hydrological calculations and assessments and start to work out conceptually what we might be able to achieve in those catchments based on the variety of different catchment descriptors we’ve got in those areas. We can then start to do higher level 2-D models at a fairly low resolution and start to look at what that means. But if we’re talking about then building that into detailed 2-D models that include 1-D representations of the river channel at a resolution of 5x5 type metre cells, then that’s quite an undertaking. We have all of the model coverage, all of those models run together, but they’re not in one single model at the moment. But we’re absolutely developing that understanding of working out the best and most efficient way of doing it.
4. **DP:** I wanted to illustrate the power of the RSP and the way it can work with WRW. It isn’t just around sharing some of that financial burden it’s also around sharing some of the technical specialists as well. The modelling side of that is part of it, certainly in the medium to longer term, one thing we can do is develop a model of the Severn and keep developing that as part of a broader reiterative process. It’s very much the start of it. It’s a really good opportunity here through the partnership work to capitalise on it and start bringing that level of understanding around the way the system operates and also the benefits these options could potentially utilise. The second thing was around reviewing reservoir management operations, which is very much a focus of our attention. I don’t think there’s been a comprehensive review of that since the original operational rules were conceived back in the ‘70s. It’s something we need to do because it’s also adapting to changing weather patterns or climate change, looking at ways of trying to maximise the dual benefits from the reservoirs, whilst not forgetting the prime purpose there particularly about the water resources. It’s a piece of work we’ve got to do in partnership as well, obviously working very closely with NRW, water companies and other stakeholders as well. That’s something we’re going to want to deliver in the medium to longer term. It could potentially involve changes to section 20 legal agreements and changes in partnership acts as well.
5. **JW:** Lorraine, have I seen your hand go up a couple of times? **LJ:** I think Charles will probably respond to what Dave’s just said about the reservoirs, but could you come back to me, I haven’t got anything new to say, but if you could come back to me afterwards?

**CG:** Thanks. I want to go back to the point that Rosy raised about the possibility of moving the Melverley argaes. The next thing on our calendar is a meeting that our MP, Owen Paterson has arranged with the EA, to do a site visit, to walk the argaes, on 13 May, which is probably still in Covid restriction, might be rule of six then. The idea of that meeting is for locals to say where on the system they think improvements can be made. That would obviously be things like, should the Melverley argae be moved. Is that the sort of thing you think might be dealt with at such a meeting (probably only half a day/a day) and would any of you guys be coming out to take part in that meeting? **MA:** I’ve just made a note in my notebook to follow up on that, and see if one of us can come along to that because it sounds likely to be a really beneficial conversation for us to be part of. It may already be in the calendar, and I’m not aware of it. Thank you for flagging that. **PJ:** First I’ve heard of that, it would be interesting to know more about the argaes. **JW:** I know that Paul Ardil in our assets team is doing quite a lot on argaes up there. We can get in touch with our asset performance team.

1. **CG:** Adam confirmed thatboth the Clywedog and Vyrnwy reservoirs are actively managed to maximise flood benefits, but, as has been mentioned, there has been persistent doubt about that for years because levels are kept higher than one might expect during the winter. Can you (David) tell us a bit more about the Vyrnwy/Clywedog liaison group that Adam gave a forerunner of the presentation we’ve just had, he gave it to them about 19 January (which we saw before our meeting with Clare and Adam on 26 January). David was talking about reviewing the reservoir management operations. People have been talking about this for years; why hasn’t it been done before? What’s the point of the liaison group? What is its purpose? How often does it meet? Who is on it? What does it do? Are minutes available? Has it actually effected any changes in the management of either dam? Because as I mentioned in my email to Adam, Clywedog only just barely escaped overflowing in the last week – the levels showed it to be 2mm below top level, which just seems crazy at this time of year when there are still storms about. It doesn’t seem to be being used for flood benefit. It’s being used either for water storage or for the benefit of the sailing club. Comments please. **DP:** It’s fair to say there’s been some quite long deep-seated views around reservoir operations. The prime focus of the reservoirs is to serve water resources and also, particularly at certain times of year, maximising opportunities around mitigating high flows. The challenge at this particular time of year is that we need the reservoirs full for the start of regulation season which is why if you look now, we certainly expect it to be at or very near 100%. Certainly with the weather there’s been over the last few years we’ve seen it shift from very wet periods to very dry periods. If the reservoirs weren’t full at the start of regulation season and we had a prolonged dry weather event we could certainly very quickly end up in the territory of drought orders with, particularly if it carried on longer, issues around public water supplies and certainly environmental harm. Clearly that’s something we want and need to avoid. Lizzie, also on the call, could probably talk around the actual control curve side and the drawdown side. I’ll just add that work is ongoing at the minute. NRW are in the process of leading a review of reservoir refill curves, so again looking at that risk of how far you can draw it down but yet have confidence that you’ll still get a full reservoir ahead of regulation season. We’ve got a further technical meeting with them in May to start looking at some of the outputs from that. That’s very much the first phase around reviewing the reservoir operations. The Vyrnwy/Clywedog group would meet ideally on a six month basis but Covid has made that difficult [**CG**: It’s made it easier, here we are in Covid having a lovely meeting without anyone having to leave their homes] – I think it really has worked so it’s definitely the future. The message we provided there, as well as giving them a bit of forward look around how we’re going to take forward a much broader comprehensive review of Severn regulation itself. That would certainly lead into a longer term piece of work because it’s also linked to gaining a much better understanding of the hydrology in the catchment, particularly around the ecology and particularly habitats at the top end of the segment of the Vyrnwy, support the protected sites at the estuary and the species at the bottom, understanding more around estuary inflows. There’s a lot of work we need to do in order to allow us to understand the system, needs around prescribed flows, any opportunities to apply best practice for river management and how that reflects in the actual way we manage the reservoirs themselves. It’s ongoing, it’s something we do in partnership with WRW and the water companies and obviously clearly bringing in other stakeholders as well who have an interest. That’s the headlines, Lizzie, is there anything else to bring in specifically around the control curves and reservoirs? **GW:** I must interrupt there because I don’t think it’s fair to say that the prime function of the Clywedog reservoir is associated with drought. The authorities always make out that this is the case but Clywedog was built in the 1960s and the original function of Clywedog at the time was more like 50/50 water supply and flood alleviation. It was the severe, catastrophic floods of the 1960s that catapulted the Clywedog dam into reality. It’s so often said that the prime function is indeed water regulation but what you imply is that water regulation equates to water supply. The prime function may be water regulation but 50% (for want of a different figure) in the interests of West Midlands water demand but also 50% in favour of Welsh flood safety and damage to people and property. You started off your piece there saying, we must all remember that the prime function is . . . most of us that live in Wales would dispute that, it’s just not true. **DP:** What I learnt, certainly from looking into this, I think there has been some, how can you say it, some creep in the understanding of the remit of those reservoirs. During the passage of time, without doubt, there has been increasing demand on water resources. There’s also other things around environmental protection side of things, particularly protecting the SSSI/SAC down the bottom end which has over time put greater emphasis on the weight of that water resources role it provides. That, without doubt, has shifted the thinking about the role of the reservoirs more toward the water resources than the flooding side. That’s not to say that it shouldn’t be managed in a way to provide benefit for flood picture but that’s where we’re at. The way that the systems involved and the reliance on it has meant that, particularly at the start of regulation season, we’ve got to start with a full water bank effectively. **GW:** I don’t think that is the case, I don’t think it’s fair to say that. You could start the season with the reservoirs five, ten metres down. That would make it safer for Welsh people who live in the valley, never mind Shrewsbury. **DP:** I think this is part of where we’re trying to get to with this review of refill curves that NRW are leading on, it’s to look at exactly that, what can we do in terms of, you’d have to apply a precautionary approach around it, but what sort of level could you drop that to and still ensure that you could meet that water resources need, also maximising potential high flow storage opportunities. The message I’ve been hearing from our hydrologists are that, when they’ve run some scenarios, even if you started with significantly lower levels in the reservoir what we would have seen is that they still would have filled, certainly particularly in the case of Vyrnwy which is more liable to overtopping. In many ways that reflects the change in weather patterns we have and the severity of storm events. Bear in mind when it comes to management there are limitations around forecasting capability, certainly for storm events we haven’t had the best reliable forecasts. There is obviously uncertainty about modelling. **GW:** Insofar as the forecasts are less able to predict beyond a few days, that in itself is a reason for keeping the level of the reservoir lower, because of the impossibility of accurate weather forecasts you need a bigger buffer because you’re faced with increased latency. **LQ:** Exactly, Mr Whitworth, exactly. **DP:** I think idealistically, yes, I don’t disagree. The other aspect of this is that we have to manage them in accordance with the operational rules, which obviously have a legal basis behind it. Now within those operational rules there are elements of discretion. At the minute we are certainly maxing out the level of discretion that we have. Lizzie might be able to comment here a bit more than I can. Certainly the way we’re managing at the minute, we’re trying to provide as much benefit as we can. Certainly in terms of reading the rules and applying them to the minimus we can we’d be in quite a bit of a different situation. At the minute we’re doing everything we can within the rules set that we’ve got. All I’m trying to do is highlight here is that it isn’t an easy system to manage. Of course you’ve got interpretation by the people about managing it and the system itself is complicated. There’s always going to be uncertainty. In hindsight, we could have done this, we could have done that, but overall all best attempts have been made to manage them well. I do push back on any assertions that they aren’t being managed well, it’s just inherently a complex system. **LQ:** We fully understand your concerns which is why we’re working with NRW. They’re leading on these refill curves in Wales and we’re working with them and their hydrologists to review their work to see whether there are any changes we can make. I know there were flood drawdown curves as part of the original Act of Parliament that allowed Clywedog to be built and that has been reviewed over time and we are now operating curves that are lower than that. Over this winter we have drawn it down even below the normal curve we would to allow for an additional buffer and some additional storage there which has helped. Unfortunately, the last rainfall event, there was more rain than was forecast. Part of the issue we’ve been having recently is that our models can deal with the rain that is forecast but if more is forecast it’s a bit of an issue. Just relating to Vyrnwy, I fully appreciate it does spill frequently because there’s only a limited amount of water we can get out of Vyrnwy and the inflows often exceed that. There’s just not the infrastructure in place at Vyrnwy to get more water out of the reservoir during times of wet weather. That was built to supply water to Liverpool and the north-west of England, that wasn’t built with flood storage element to it. It’s just been almost impossible this winter to get it sufficiently drawn down to provide flood storage from Vyrnwy itself. **DP:** I’ll just come in there as well just to add, there’s obviously controls over the releases we can do depending on the dam flow levels, statutory flow levels there as well. **LQ:** Yes. Whenever our lead person looking at the reservoirs wants to make a release they do liaise with NRW and check to make sure the statutory level on the rivers are within tolerance and if it is too high releases can’t be made because it might cause further flooding and we have to wait for the river to drop slightly before we can increase release from Clywedog. **DP:** And of course what tends to happen is, that’s OK if you have a one off storm, but what we have seen, some of the weather patterns is when you have storm after storm after storm with very narrow windows in between. So that undermines that ability for the levels downstream to fall and in some scenarios you can end up with a situation where you want to make a release because you can see a storm coming in but the levels downstream are still too high. You can hold that position for a certain amount of time before eventually capacity is reached and the reservoir will have spilt. It’s worth adding that, even when it’s full there’s still benefit in terms of buffering some of those inflows. There’s certainly benefit in having it there than not. But it’s not easy.
2. **JW:** I’m conscious of time. Do you have a last question, Charles? **CG:** Thank you. I’m conscious of being talked out by you EA guys which is what I was afraid of. Just on that, Clywedog was built for flood alleviation. It was built on the back of the 1960 floods for flood alleviation so it sticks in the craw to hear you say it’s for water resources. The answer to that is find some other water resources. Vyrnwy is a problem because it can’t discharge fast enough. One idea that’s been put to me, it may be a joke idea, I don’t know, is get some massive great syphons to get it out quicker instead of that little release valve down at the bottom. I’m glad to hear you’re learning about the management of Clywedog, David. It’s been there for nearly 60 years, I would have thought it was a well-oiled machine by now. And Jason, I did want to talk about the map that Adam sent us, but there’s no time for that now. It’s been a really useful session, thank you all very much. It’s great to hear so many of you talking. **DP:** When you talk about new options, that is part of the work that WRW are looking at generally for the geography they cover and again if you’re looking at sustainability as well as potential transfers and things like that, reservoir operations do fit in there. All I can say is that in itself is a longer term piece of work. The impact of the reservoirs aren’t forgotten, we are very much looking at ways we can improve it. I am listening to you, I do take your point, perhaps some of the thinking around the reservoirs has been under tension certainly what local people were told. I can only convey the position that we’re in now and the importance of supply to the West Midlands, what is it, five million plus people? It’s of major strategic importance but that’s not to say we shouldn’t do everything we can to try and maximise any flood risk benefit associated with it.
3. **JW:** That just leaves me to say thank you all very much, it’s been really productive and collaborative and we’ve got a lot out of it from a project perspective and hopefully you guys have as well. Lorraine? **LJ:** Have we got a minute, or are we going to run out of time, because I didn’t have a chance for you to come back to me? I’m not saying anything new. Thank you for your time. Thank you for your honesty. I’m afraid I’m still very scared. Thank you to Paul for being honest about the fact that we were just looking here at the dam [at Shrewsbury] and if people hadn’t kicked up a fuss round and about you said you wouldn’t have looked wider at all the catchment. So thank you for your honesty, I’m really scared about that. I don’t understand the numbers, I’m only a primary school teacher so it’s all beyond me, the 700 cumec, I’d love to know whereabouts that is in the confluence area and how it compares with different sites in the confluence area, whereabouts in the confluence area will you put all the rest of that water to bring it down to 350 cumec, I really want to know. Thanks for the honesty also about how, yes, you know roughly what’s going on but you don’t know the specifics of where it comes. My family have lived there for six or seven generations and farmed on a family farm. Different floods bring it in different places slightly differently. The argaes make a difference, the river Vyrnwy, the river Severn, the river Cain, the river Tanat. I’ve worked 30 years teaching in Powys, I’ve got colleagues from Llanidloes, from Llanfyllin. They tell me, and so did my dad when he was alive, that overlap between faming and teaching, if you haven’t got a model that works together on the whole of that area. Our own farm has the Vyrnwy water come over from Maesbrook four miles away, it’s going back into the Severn and the Severn floods the other part of our land. You’ve got to have the entire understanding of it all. So those models, really we need you talking to Wales. We care about Wales and they care about us in the confluence, we all work together. It hasn’t really reassured me but thank you for your time. We need people in our area both sides of the river, talking to us, looking at exactly what happens and how it affects us before you change anything or give us any more water. So thank you very much. **MA:** Lorraine, if I can just come back on a couple of points on that? I know we’re nearly out of time so I do apologise. I completely appreciate that. The whole point of coming to these conversations is that we don’t do anything without talking to people because we want to make sure we’re capturing that local expertise and that local knowledge. What I will do off the back of this just to hopefully give you a bit of reassurance is give you an overview and a breakdown to show where all the control models are, the catchments they cover and also give a bit of a breakdown going down the catchment in terms of those design flows that we’re looking at and that we’re working with. So the flows that Paul’s been talking about have been immediately upstream of Shrewsbury at a single point. Paul started to demonstrate what those flows look like for you. **LJ:** We want to know how it’s going to impact, and a point I was going to make and didn’t say, if it hadn’t have leaked about the dam is that we don’t know what you’re considering. We want to know how it’s going to impact. We want to know what we think it’s going to do. To get that feedback we need to know these different structures you’re looking at because that’s where you got your feedback on the other one. **MA:** Absolutely. In terms of that NWRR it was about making sure we didn’t miss an opportunity. In terms of what those structures are going to be – we’ve got no idea at the moment. **LJ:** We’re trying to represent a lot of people with a lot of knowledge out here, that you need to come and talk to us. **MA**: I absolutely agree and that’s the information we want to capture to make sure that we’re including that local knowledge in our thinking as we develop this plan. **PJ:** I agree with Mike. What we’re trying to do, Lorraine, is we don’t miss out any opportunities that are out there for data gathering and understanding how things work. **LJ:** What I found really reassuring, Paul, is when you said your models don’t cover everything. For example, it was after either the 98 or the 2000 floods, brilliant EA people who worked really hard on the ground were out there measuring a mark on a hedge. My brother-in-law who farms on the confluence came along and said what are you doing, oh, we’re measuring the height that the water got to. No lads, you’re not, that water was way up there over that hedge. So what I’m saying is, those measurements, which you’re relying so heavily on, without you being out there and you’ve spoken to the people those measurements aren’t necessarily all the measurements and that scares me, when so much is predicted based on those measurements. OK? Thank you.

**JW:** Thank you all very much. I’ve just put my email address in the chat box. Feel free to email me or it might be Imke. We’re more than happy to have a one-to-one conversation. Thank you all very much, I’ll close the meeting now but we’ll continue to be in touch as we develop the project as well. **CG and others:** Thank you all very much, and for assembling such a useful team.

**The meeting closed soon after 6:10 pm**

**Suggested Agenda** offered beforehand

1. *Brief introductions*
2. *Management of Clywedog and Vyrnwy Reservoirs – brinkmanship?*
3. *Hydrological models – in what way is the river system responding differently?*
4. *Map of argaes, flood doors, outfalls etc – could further changes improve performance?*
5. *NWRR planning application - involvement of EA/RSP/SVWMS*
6. *SVWMS Strategic Outline Case – progress; contact with IDBs*
7. *EA review of February 2020 floods*
8. *Further meetings*