

## Nenthead community consultation: 21<sup>st</sup> November 2022

Simon Wilson - So, a warm welcome on a cold and wet evening. Very good to see you all for this update session on plans around treatment ponds here in Nenthead. My name is Simon Wilson, I'm an independent facilitator. I have met most of you before I think but I'm not part of the team doing this work. I'm here purely to facilitate the conversation and make sure that as many as possible of your questions get asked and answered.

The overall format is, we've got a couple of hours until 8 o'clock if we need it, if we finish before then, that's also fine. I'm going to ask Jan from the team to just do a sort-of five-minute intro and then really open it up to you. The purpose is to provide you with an update of what's taking place and the opportunity to ask any questions and to get answers from members of the team. Just before we go any further, can I ask you to say who you are and what you do, starting with you Jan. I think most of you will know everybody, but I just want to make sure we get that done.

- Good evening, everyone, I'm Jan Brand, I'm the Coal Authority Project Manager for this team.
- Good evening, everyone, I'm Nick Cox and I'm Programme Manager for the Coal Authority.
- I'm Andy Edwards from the Environment Agency and I'm the North-East Lead for the Water and Abandoned Metal Mines project.
- Hugh Potter from the Environment Agency, I'm the National Water and Abandoned Metal Mines Programme Manager.
- Hi, I'm Sarah Darling and I work for the Environment Agency engagement team,
- I'm Holly Dodds and I'm for the Coal Authority – engagement, stakeholder and communications.
- I'm Caroline Wood, I'm with the Coal Authority and I'm Programme Support.

- Thank you. If it's OK, I'm going to ask Jan to speak for about five minutes to just update you on where we got to, and then open the floor and it's over to you.

Jan Brand

Forgive me for reading from my sheet, I just didn't want to forget anything. We've had a busy six months. We've been working on developing more of the design to treat the pollution that's coming from the adits. I hope that you recognise some of the progress that we've made has been a result of the comments that have been made by the community and some of the questions and concerns that we've heard here six months ago and in written correspondence with the Authority.

I'll just go through the items: Over the summer months, we've conducted revised ecology surveys and the timetable of those surveys was done to reflect the latitude and the elevation at Nenthead. It had been correctly commented that previous surveys had been done on a more typical ecological calendar, whereas this time [it was] a little bit later to reflect the later emergence of the season up here. We've done an arboricultural survey which is the trees within and close to the site boundary. In planning terms, we have something called the red line boundary, which is the big red line that goes around site proposals that can be referenced with the planners. So, if you hear us refer to 'the site', it is within this red line boundary. We've had a meeting with local representative from the local red squirrel group, so we're grateful for that. We've installed a weather station. That's on the top of the reservoir and we've also got a local temperature sensor, which is down in the Nenthead carpark and that's to provide us with more local weather information. We've done a background noise assessment and that was, an acoustic consultant came out and did measurements of the noise. That was a direct result of some of the comments that we heard here about concern of the potential noise of the pumping station, and we will do that again because what we want to

know is what quiet sounds like. Here, we acknowledge it's a rural, quiet community so we want to know what the background noise level is. We've been working on the location and preliminary design for the pumping station. We've got some mock-ups up here. These are early stages. Afterwards, or now even if you'd like to go up and just see what it might look like down at the carpark. We've undertaken some CCTV surveys of various tunnels and pipelines so that we have an understanding of the location, capacity and condition of the sites now. We've had geotechnical experts come out and review the geology and condition of the pond site, so that we are best informed about the engineering required to build the ponds. We've looked at one of the options that was raised in this room in May about potentially taking the pipeline up the river corridor. There was a question about whether or not we could...rather than take the pipeline from the adits up the track, whether we could actually go in the river so we've had a report taken to see whether that's an exercise we can do. We've uploaded quite a few more documents to the website that better explain the site selection. This is now live on the website and details of a much more complicated and in-depth overview of why and how the site has been selected. At the request of your local constituency MP, Dr Hudson, we had a face-to-face meeting with him in the summer. He raised some other concerns that you had shared with him, so we had a meeting with him. The reports that I referred to here will be put on the website in the next few weeks and they'll be available for you to view.

The work that is ongoing...so those are all things that are finished, and we can share shortly. We're doing a peat assessment, the landscape involving peat, obviously is very precious and valuable so we are doing an assessment to see where the peat is in relation to our proposals, so that is going to be done quite soon. Again, we'll share that when that's been finished. We were asked to provide details about the pump specification that would be involved in the pumping station. We had hoped to be able to share that tonight but unfortunately that is still ongoing but when we have that information, we can then provide more detail about the pumping station itself. So, coupled with the noise, hopefully we can then provide the pumping station, the installation, the pump noise package, we can share that with people. We've engaged a specialist organisation to investigate the reservoir pipeline. If you recall, I mentioned last time that there is a possibility of using a pipeline that has been in the ground between Handsome Mea, it runs down the track and pretty much comes out at the bus depot and it would be really good if we could re-use that pipeline, so we've engaged a specialist contractor to look at that. And again, we're hopeful that we'll share the results of that when we know about that. We've been looking at opportunities to reduce erosion damage on the mine site. The main pollution which is impacting the river comes from Rampgill and Caplecleugh adit, that's the main pollution that we want to deal with, with this scheme. But we also acknowledge that there is diffuse pollution that gets mobilised during rainfall events so as part of our proposals we would try and reduce that and in doing so, also stop some of the damage to the monument, which I'm sure you will have seen, you get heavy rainfall events, and you do get erosion particularly of the path. We're looking at options for the footbridge from the carpark that goes over to Dowgang, that's something that we're looking at. And we're also starting to look at the construction phase planning, which would be how we can minimise the impact on the community. We are very aware of the concerns that you have about maintaining access for residents, businesses, the noise, the disruption, the comms... so we're starting to look at that. We're hoping to have one of these community events on a weekend next year because we're aware that not everybody can come to an evening so we'll commit to that in the Spring. And then one of the things that we would welcome is, when the Nent Hags treatment scheme, which is the one that is being competed down the road, once that's up and running, we're going to try and have some sort of open day. We will have to think a bit more about how we can do it so people can come and see one of these treatment schemes in action. And I think that's it for where we are at the moment. We are continually updating the design. In fact, one of the things I've missed here is that, since we met in May, we've moved the ponds south, away from the village by a few metres and that takes the reed beds, you might see that this iteration is slightly different from previous plans that have been shared.

Simon - Thank you. So, that's quite a lot. Let's open up to questions and if there are points to add, we'll bring those in. So, who'd like to kick off? Yes please.

**- Can I ask, when you talked about stabilising the scheduled monument and the mine site area, would that be naturally, or would that be more construction?**

Jan- Some of the things that we're looking at now is to try and control where the rainfall flows. There are some existing leats as you know which channel the water in various locations. Some of those can be, either maintained or repaired to try and keep the water in the right channels. There's an additional area where we've noticed that there's a culvert collapsed. That should be quite an easy fix to go in to just stop the water flowing into those areas. There are a number of things that we think we can do. More of a maintenance element. We don't have any big construction plans for any of those things.

**- You referred to the site. Do you actually own any of the site yet? Are you in the process of negotiating to own the site? Have you handed any money over to the...**

Jan - No. At the moment they are plans and we are in discussion with Nenthead Mine Society over the potential to have a long-term lease. We have not entered into detailed discussions with them yet and we haven't paid any money to them.

**- So, if they turn round and say no, what would happen then?**

Jan - We hope they won't say no.

**- Obviously you're aware of the assay. They have the assay and the assay states that anything that happens on that site has to be for the benefit of the community. So that's what they signed up for when they signed up for having the assay, so hopefully you're aware of that. Also, they're not meant to change the use of the site, either above or below ground at all and that's what they signed up for. And to confer with the community at all times – they haven't. So just be aware that, you know it's the assay that they've taken on is for the benefit of the community. And as you can tell, we're not quite sure this is going to benefit our community.**

**- Just on Brian's note that, on your new suggested plans where the water course is going to be taken up the blue line is actually more invasive over the actual scheduled monument site than if it went up the track and if you look on...where you've put the blue line, it goes up and around, so on one of the provisional plans, it's going to go up the track up behind the original dam and that was where it was going to go. It doesn't now. It goes up and around...**

**-...it goes south, doesn't it?**

**- Well it goes more invasive over around up over the scheduled site so I'm just making you aware that the assay that they have taken on as a mine heritage group, the assay has to benefit the community. So, I'm just noting that more of the scheduled site is going to be disrupted.**

Jan- I think we would definitely comment that there are significant environmental benefits to the scheme. The reason we want to do this scheme is because of the continued pollution from the two adits and that there are very real reasons for doing that and I would assume that that would at least count towards some of the benefits.

**- I'm not sure, but the community totally takes on board...we're not saying we don't want the water improved but Adrian, who unfortunately can't be here at the moment, has found lots of different less invasive techniques, and Hugh's very aware of this and obviously knows all about talking to Adrian and stuff...that can be investigated. But what you're saying, we're not against the water being improved because obviously, in this age of climate change and everything, that's what we want but where it's being detrimental to our community and our environment for a benefit...for a small benefit up the river – I'm not sure.**

**- You were on about discharging from the treatment plants, down [inaudible] to somewhere in the river which leads to the hydro- turbine. Why could you not discharge for that and get more green electricity?**

Jan - That isn't an option we've discounted. We haven't yet worked out the optimum place to return the water to the river. That's an area we're still looking at as part of the design and I think there are some benefits to return to the reservoir.

Andy- Part of the reasons that we can't just go ahead and do that, is when you're getting a lot of water in Handsome Mea, there's an overflow for the reservoir to protect so that the level is maintained. That overflow then comes through the Nenthead mine site and it's causing some damage to the scheduled monument so that some of the work we've talked about with managing service waterflows, includes that overflow. So, if we're going to put extra water into Handsome Mea, it needs to be manageable so that the overflow from the reservoir doesn't cause any additional issues by us putting water into it.

**- So you could put your own turbine in?**

Nick - We'd certainly look at... we've investigated this micro-hydro, which again would be part of this assessment of the various options. So, if it wasn't possible to put it in to Handsome Mea, we'd certainly look to get maximum benefit from it. Yes, absolutely.

Jan - And that could run 24/7 because the plan is to treat 20 litres a second so micro-hydro could be 20 litres a second all the time.

**- And how much of the energy required to run the site, including pumping the water up there, would you get back?**

Jan - Probably nowhere near as much as we would need. We can have more of a say about what the energy draw would be when we've got the pump specification, but we haven't got that. But it could be, for example that any micro-hydro unit could be used locally at the top.

**- No, I was thinking more in terms of the net zero aspect.**

**- Can you explain to us how you are going to meet the net zero energy usage, seeing that it is the forefront of the COP 27 meeting that's going ahead now and how you are going to quantum this when you activate the pumping system. Because that's obviously going to be quite intensive. So how are you going to meet net zero energy usage with a pumping station?**

Nick - So, firstly, just coming back to one of your points Jackie, you mentioned Adrian obviously had some discussions with me around different treatment technologies. So, fairly early on in the feasibility stage, the contractor assessed a number of different treatment technologies, and obviously one of the things that we are looking at is, not only the initial capital cost but whole life cost, which includes carbon footprint as part of that process. Some of the things that Adrian had flagged, some of these sort-of more, what we would describe as active chemical treatments, they have a much larger carbon footprint than what's currently being proposed.

**- I think actually you might slightly be not quite so sure. Because actually what he discussed with Hugh was a lot less carbon because he mentioned the Cardiff research. I'm not a scientist so I do apologise...**

Simon - There's two things here isn't there? One is, the carbon footprint of what you're proposing. And the second thing is, are there other options...do other options have less of an impact.

**- It's about, the enormous energy use for pumping water uphill, when we're nearly at the top of the hill anyway. And that, maybe there's nowhere downstream where you could do one of these, but something else downstream and you'd instantly no longer have to pump the water.**

Simon - So, let's just let Nick and Hugh speak.

Nick - I guess what I was trying to describe was, for example within the current WAMM programme, we

have a site which uses active treatment plant in Cornwall which is much more carbon intensive than what's being proposed. I accept that when you're pumping water uphill, there is a carbon cost to it, absolutely. Saltburn is another example where we pump water out of the ground and treat it before discharging it. In that scenario, we constructed a small solar farm nearby because that was adequate and there was enough land and it fit that particular landscape. As Jan has said, we are still investigating how we could go about powering that. It could be that we can look at the existing hydro, we could look at micro-hydro, but I guess what I'm trying to say is that as part of our assessment, and indeed our government process is that we have to have as small a carbon footprint as we can and that has to flow all the way through the treatment process including bringing materials on and off site as well as, if we're using chemical treatment, how those chemicals are produced.

**- Also, it's lifelong isn't it?**

**- It's not just going to be for the next year that we are very good and our carbon footprint is going to be sort of...it's a twenty-five thing and hopefully we're still going to be here in twenty five years. So we've got to deal with what you're placing up there, not just in the next year but it's for our lifetime because this is our community.**

Nick - Yes, and we accept that so in that process of assessment that we've just described, our standard is to look at it over a twenty-five year process. In the same way when we look at the benefit from doing the work, which again is done through a third party and they assess that, again it is discounted over that same twenty-five years. It's a standard government process, a Green Book treasury process, what we call a cost-benefit exercise. So, there's a monetary value placed on the benefit of improvement and there's a monetary value placed on the cost of building, which includes things like the carbon inputs and so forth. And if that isn't a positive ratio, we can't proceed.

**- Pumping water uphill, the cost of doing that has just trebled in the last few months. That, surely given the low-cost nature of the actual treatment and everything here, relative to other things, that must have a massive impact on the...**

**- This is about energy costs affecting the overall...**

**- Yes, because the energy costs of pumping water uphill seems to be a phenomenal part of the running costs. What is the percentage?**

**- Well, that's what I wanted to ask actually, what is the current projected annual cost of this treatment process considering the rise in....and is going to rise future and further...**

**- The main component of the running cost has just trebled in cost.**

Jan - It will be the pumps that are needed to transfer the water, until we've got those sized, we won't be able to...we'll need that information before we get a green light.

Andy - It's about looking at those elements that we do put in place, like the pumps because they're not determined yet. So, making the right choice of pump to put in to make sure it uses as little as possible. We've already talked about the potential of looking at micro-hydro, whether there's any potential for solar power. All of those elements, we're not at a final point on any of those.

**- But you're still confident that this is the cheapest thing to do?**

Andy - The alternative...the reason we've ended up where we are, is that we've gone through a site selection process, as Jan mentioned. We updated, I think we accepted there were some gaps in how we'd explained that previously. Hopefully, what's on the website now will answer what you wanted us to answer. But we have been through a selection process and there are only so many places that we are able to put something like this. If you take it too far downstream, you're then talking about a pipeline in the road similar what has happened in the Hags. And taking the water downstream, with it being at the top of the valley, you're then likely to have to return it because of the loss of water to the river. Because, through the summer months those two adits do put out quite a lot of water into the river. And so taking water out of the river, it has to be put back, either at the same place or upstream so that we're not starving the river system of

water. So, if we took it too far, we would have to find some way of getting it back up so it would be the same sort of problem as you're describing.

**- Can I ask Hugh about the aeration cascade that you were proposing, to be built at the same time as the rest of the works, which was meant to save on the cost. Why isn't it on the map?**

Hugh - I think there must have been a misunderstanding in what I may have said before. I certainly didn't mean to give the impression that we wouldn't decide what it was going to look like until we were on site building. Whatever's being built, we will have designed before we go on site to start building. The aeration cascade, I suppose what I was trying to say on that is, we need to re-oxygenate the water when it comes out of the bottom of the ponds before we can put it back in the river, because by design it has no oxygen in it, because that's how the metals get removed – we strip all the oxygen out. So, before we put it back in the river, we need to put oxygen back into it. There are multiple ways we can do that. What we are proposing to do is initially, or primarily to use the hydrogen peroxide dosing system, because that destroys the hydrogen sulphide, so it gets rid of the risk of smell and by doing that, it also puts lots of dissolved oxygen back into the water. An alternative way to do it is to put in an aeration cascade, which puts it down a series of steps and that just naturally aerates it. We're not proposing to do that on its own here because that would have the risk of releasing hydrogen sulphide odours. We would also put, another way of putting oxygen back into the system is to have a wetland on the back end of it, so a constructed reedbed that we would put in the same way as the one in Haggs. Because also, by putting the water slowly through those reed beds, just the plants put oxygen back into the system. And again, that's another way of doing it.

**- Where though?**

Hugh - On the plan up there, there is a space for a reed bed but going back to the carbon question, the reed beds in themselves capture lots of carbon because you're growing plants and that's stripping carbon out of the atmosphere so that offsets some of the carbon that is then needed to be used, generated by having to operate pumps. So, exactly what will go on the back end of the treatment ponds, whether it's a cascade, or a cascade and a wetland or just a wetland, we haven't decided yet. But that's just part of the design process and it's completely normal in a design project like this that there are options. But we would have to say in the planning application. Part of the planning application is exactly what we're going to do. So, we would do that, we wouldn't then be making it up as we go along on the construction site.

Jan - And it wouldn't be a big feature? It would be a fairly small scale – we're not talking a glamorous cascade or some monumental feature, it would be quite subtle – it would be steps to agitate the water.

**- And that's not having anything to do with hydrogen sulphide?**

Multiple people- No, because we're absolutely clear that...

**- I mean, how big is the site going to eventually be? How many times are you going to change it with the construction site as well? How much of the land is going to be lost to all this?**

Hugh - The plan that is up on the wall I think is on your tables...

**- But you've changed it a bit at Haggs, you've had to as you've developed things. So, you don't really know do you, exactly how much land you're going to be needing?**

Hugh - When we put in the planning application for Haggs, I don't believe that things have changed in terms of...

**- They have.**

Hugh - The size of the ponds is the same now as the ponds now as they were in the planning application, the size of the wetlands is the same. There have been some changes around the odour-dosing building on site, that has got bigger because we've put extra...

**- So there has been a change**

Hugh - In terms of the building but the ponds have not changed.

**- I was just going to say that I don't think any of your arguments are helped by the mess that is at Nent Haggs. I mean, it's absolutely shocking and it's been like it for a couple of years. So, speaking**

personally, I have absolutely no confidence that this isn't going to be anything other than a similar mess. And none of that is working. And I don't honestly know how it's even good use of money to plan for this scheme. You don't even know if it's going to work properly and be functional at Nent Hags. It's beyond me that that's possible. Why are you spending all this time and money doing that, when that is still a muddy field, and nothing is happening there?

- And they've destroyed the road. They've made the road absolutely lethal in the winter, because the water is flowing the opposite side of the road to what the drains are. You get ice on that, it's going to be lethal.

- There's been constant disruption along there, making people's lives difficult. And that field on the other side, it's doesn't look natural. It looks like a massive, massive muddy puddle. It looks awful, with that pumping station stuck in the middle of it.

Andy - You're referring to the field where we've got the pumping station as opposed to the treatment site?

- Yeah, the treatment site is terrible. It's absolutely ruined what is a beautiful bit of valley. Of course we don't want that to happen up here.

Jan - I hear what you're saying. I think that in a few months when the planting has...it was finished less than two weeks ago, the wetland planting, that meadow has been seeded with a preparatory mix of hay meadow that's suitable for this area. So, I don't deny that it's brown and wet today - I've driven past it, it was brown and wet - but once those seeds have taken, we're going back at the end of the month to do some tree planting, which is going to be natural tree planting, so we don't want to have a line of trees that looks artificial. We're going to have a meadow that I hope I can sit here in June and say it looks brilliant.

- I hope so too.

Jan - The planting that happens there, will invite more insects and pollinators and we will get more wildlife back to that field.

- What about the main road?

Simon - So, there was a comment about the road and the water on the road and the risk?

- The water's on the wrong side and it doesn't even hit the drains.

Hugh - With the road, we have had visits and spoken with Highways as well and there is clearly an issue with drainage on the road, which comes from a lot further up and is nothing to do with the works that we've done and it's coming all the way down the road valley. Highways are looking at that and our contractors have been back out and looked at specific issues with the...

- It's not a Highways problem, it's a Brown's problem.

- The water that's coming out it wasn't come out of the same place as before...

- It was never on that roadside

Hugh - As Jan says the field, it's clear that it's muddy at the moment. It may or may not reassure you but the bank of the treatment ponds on the main site where they're constructed at the moment, the side of that which faces the river, last spring or the spring before was made into a muddy mess when they were doing all the construction and re-mobilising stuff. There was no planting put onto the side there, just the topsoil was put onto that, and it has re-vegetated itself over the summer. This is really rich, rich grasses and wildflowers in there. And that happened in the season, and we would expect absolutely that to happen and even more so at the site. We completely accept it's a mess and we have said this before and I'll say it again, we do apologise for the length of time it has taken, the construction project, because we recognise the, particularly the impact on the community in terms of the road and the construction has been very, very bad and we have apologised for that. And we have absolutely learnt from what has happened there. Much of it was outside of our control but that's not a help to you and the community. We've learnt from that in terms of what we would do at the Nenthead scheme and plan thing differently and certainly almost no work would be needed in the main highway so a lot of those issues we've had at Hags would not be happening again.

- I just wanted to say [inaudible]...the Highways is just a joke. The road cambers the wrong way...[inaudible]...there's water on the side that's never been there for years, and you've just made a mess of it all.

-...No, I'm just going to say, you've got all this going and how's the community...what benefit is it for the community? How are they going to benefit from this?

Simon - So, there's two points here. One is about the state of the highway and the second is, what's the benefit to the community?

Jan - We have been contacted by local residents about the highway issues and we've met with both ourselves, the contractor and representatives from the council highways. There are some actions that are still outstanding and perhaps we can take an action away to share who is doing what. Off the top of my head, I'm not sure who's committed to do what action. There was some re-planing of the road surface that has been identified, that actually the tarmac there was too high so the water wasn't getting through...

- ... so that'll be another three months.

- ...there's not even a camber on the road.

Jan - ...and one of the things that we did do before is have a condition survey of the road. So, I think one of the things we can do for this meeting is to share the actions and who's going to do what and when. We have been talking fairly regularly – Holly our comms colleague has been in very frequent communication with the immediate community next to the horse and wagon field.

One of the things, in answer to your 'what is the community getting back?' we've opened up the access to that field and while you wouldn't want to walk round it this evening, next summer it will be a really nice place for the community to...

-...or at any point for the last two years because it's not that it looks like a muddy field because November it's looked like that for two years.

- So all this hassle and we're getting is a place to walk?

- But we'll lose other places to walk.

Jan - We've done the planting at that site in collaboration with the Tyne Rivers Trust and we've also had input from the AONB Partnership and Woodland Trust I think were consulted as well so we're hopeful that what we've provided there, prior to the pumping station site, it was a grazed field, it was a nice grazed field. We are hoping to increase the biodiversity interest of that field. And one of the other things that we have done as part of the Nent Hags project, prior to the work, there was a large section of that footpath that was closed because it had had river erosion, so the Coal Authority project improved the footpath from one of the corners to the Foreshield Bridge along the Isaac's Tea Trail. So now you can walk from Nenthall to Foreshield Bridge and I did that recently so – good improvement.

- Can you explain to me, as you show on you projection that the ponds, or lagoons are going to be sitting high up on the bank? Because obviously, the site where you're going is a hill anyway. So obviously we're going to have to dig in and how's this bank going to be secured...it's not going to blow away obviously...I still can't envisage how you're going to build level lagoons on a hillside.

Jan - The two ponds are going to have a downstream embankment, just the same as Handsome Mea

- ...but the camber of that hill is huge. So, where the weather-station is, and presumably it's going to be where the lagoons are going to be situated, so the camber of that hill is that, so you've got to build that to make it level. So it's not going to be two foot. It's going to be huge.

Jan - It won't be dug out, there will be formed engineering...

-...So you're going to be coming in from where...that's quite a big build of height that you're going to have to do to make it level, so it's quite scary, how high this is going to be.

Jan - And it will be...it's an engineering design, it will be designed.

- What will it be built of? because it can't just be built of mud because it won't survive.

Hugh - We can't answer exactly what it will be built of, it will be built of a material that will stand up in a



secure way and with all weather conditions and be there for the lifetime that it's needed to be built for. In the same way that any embankment, any engineered embankment would be built...

**- This is Nenthead.**

Hugh - And that will be taken into account.

**- ...we have the high wind so, I'm really sorry but can I just, sorry, I'm really sorry to interrupt you but obviously we're all a bit passionate about this. This is Nenthead, we have the high wind. Now, hopefully with a couple of years from the weather station you'll understand what we're talking about because we have wind at home, constant. When they say you'll have 60 miles an hour, we have 80 up there and it's even more on the fells. So, mud alone, however compacted it will be, will not survive, it will blow away and crumble.**

**- Yes, it's quite exceptional the weather conditions. It's really important.**

**- I think you need to camp up there to realise.**

Hugh - Absolutely. I mean, all we can say at this point Jackie is that it will be designed to cope with whatever weather conditions and everything else. And we can look into...I mean that clearly is going to be part of the design that is, how it will stand up under the weather conditions in the location that it is.

**- It has to be a natural product. You can't make it out of the non-natural product. You cannot put concrete because it's on an AONB...**

Andy - Before we move on, there's a visualisation there. The slope that has been designed for that embankment is pictured on that bottom picture there. And that's what's currently being designed and the detail of it will follow but that's the sort of thing that...

**- Thank you and I completely get that, but my understanding is that the ponds are going to be deeper. So, that looks quite shallow. You were originally going to have three ponds or three lagoons and we've now got two which is, OK it may be better but they're deeper so the height that you've then got to create to sustain this for the bank has got to be greater than what's being shown to a certain extent...**

Andy - Those visualisations are the most current ones. They don't need to be deeper than what we're showing there.

**- OK.**

**- Again, what you've done before is not helping you here. The carpark and the way that was underpinned was absolutely appalling. Despite the fact that you must have had to do wildlife surveys and all the rest of it, you destroyed a colony of sand martins there and you've got a wooden – I don't know what it's made of – but it doesn't look remotely natural, with holes in it. The grass has never grown properly on it, it's just scrubby. It doesn't look lovely. It's not ecologically anything other than a disaster. So, what we don't want is that up there.**

**- Can I just say, the sand martins have relocated on the site that you want to put the lagoons on. So, you're going to disturb them again.**

Hugh - I wasn't aware of that, although certainly when our bird surveys were done they saw sand martins on that area but they certainly didn't see any sand martins nesting, because there was no obvious nesting points. So, it would be interesting – if we could have a chat afterwards we can work out where on a map and then we can point it out for next year.

In terms of the artificial sand martin habitat, that was an RSPB approved sand martin habitat which is why we put it in. Yes, absolutely, the sand martins did not come back and it's a huge shame and...

**- It needs taking away because it's just an eyesore.**

Hugh - What we are doing, is we're looking at putting another one up. I don't know that exact design, what it's going to be. But again, what we can go on is what RSPB and others say works as artificial sand martin habitats because...

**- Well, the clue's in the name. Sand.**

Hugh - There is sand in the tubes, behind the front face there, you can see that in there. And that design was put in because it works in lots of other places. Clearly it hasn't worked at this location so far but it is something we continue to look at.

**- Does this mean that we have to spend years with you sort-of solving problems that you've created and losing our wildlife...**

**-...it's just not desirable...**

**- I'm sure there is, Kim told me that one of the comments about squirrels was 'it will be interesting to see if they return'. Well, you know, that's not good enough.**

**- Well, it's interesting to them. It's actually quite important to us.**

**- Going back to up top there, you've got your reed beds – how deep is that reedbed going to be? Because, what I'm concerned about is, we get a lot of frost here. It may be minus two down here and it'll be minus five, minus ten up there. That reedbed is going to freeze over. The water will not flow through it. What's going to happen then? You're still pumping water into your ponds, the ponds are then put to your reedbeds which are frozen, what happens? It runs into your reservoir.**

**- The river freezes, the waterfalls freeze.**

Jan - In that situation, it wouldn't back up and go into the reservoir. If it did freeze, it would go over the top and return to the pipeline.

**- I see here, you've got your pipe coming out of the pond that has gone into your reedbed, well that will still flow wouldn't it?**

Jan - The levels would be such that the ponds would keep the water contained.

**- Your pump will still be pumping water into your ponds, at 20 litres a second, so, there's going to be a lot of water up there, where's it going?**

Hugh - I think, well exactly, and I think all we can say at this point is clearly we have to take that into account as we design it, both the depth and the pipes that we have in there, to ensure that it doesn't freeze all the way through so the water can continue to flow through it. And we have to take account of that as we design the reedbed. As a result of that, I can't say right now whether it will be 200mm, 300mm, 500mm. We have to take account of that as we're designing.

**- So you need to monitor weather up there, at a least a couple of winters before you actually go ahead with this.**

**- Very hard ground frosts.**

**- With the wind which comes along, on a frosty day...**

Nick - Sorry, just to close out a couple of the other points. So, just on the sand martins, which I agree it is really unfortunate, that particular site was putting more than a tonne of lead, zinc and cadmium into the river every year. Caroline, I think we have sourced some different sand martin boxes have we not?

Caroline - We have.

Nick - I'll take an action, I will share with you as part of this follow up process, will share the design with you and equally where we intend to put them. But we haven't given up and obviously our hope is that they come back. You also asked a question before, I think you were talking about (and I agree with you) the Higgs treatment site at the moment is a mess. It is a construction site and we obviously hoped in a pre-covid world that we would be long finished, well before the two years. It's unfortunate that things have happened the way they have. You asked the question around 'why would you go ahead with Nenthead if you don't know it works?' Well, clearly we're confident that it does work. We don't believe we're doing anything that is unproven elsewhere. And equally, in terms of Nenthead, I know there's a lot of concern there around the temperature here but back in 2010, Newcastle University ran a small-scale trial, a four cubic metre Braithwaite tank trial using the same type of treatment media that we were proposing to you which ran for two years. So, in a similar environment, the metal removal averaged (I think) around 85%. Again, we can provide some of the data. So, there is some evidence. And when you say we don't understand the climate

here, those sulphur reducing bacteria systems are proven.

**- Can I just come back on that. The thing is that I appreciate you do things with good will, like the sand martins and all the stuff that happened around that. But you say you're confident that Nent Hags will return the benefit that you want it to, but you don't know yet. And, when things like Nent Hags looks like it is and all the delays and the terrible mess and then the work was done on the carpark and the sand martins, you don't give us any confidence that what you're confident about is going to happen. The work that was done on the car park is another problem that needs to be sorted out. It is really unpleasant to look at, and my house is right there.**

Nick - As I said, I do acknowledge your concerns and I've already taken an action that we will share that information with you in terms of what we're going to do in terms of that replacement sand martin habitat.

**- But it doesn't really answer the question of, why don't you wait and see what happens at Nent Hags and be confident, you know...not confident – have evidence that this is something that will be of benefit.**

Jan - This is something we can do now the timetable has shifted to the right. So, next year, when Nent Hags is turned on and commissioned, we will be able to get the water quality samples, we will be able to say it's removing whatever percentage of metal, so we will be able to prove that it does what we wanted it to do. We will be able to walk round on a summers day and know it's not smelling. We will be able to look at it and see that it's grassed over and it's green and it's in the landscape and that's hard to believe now. But in July or August when it's ready, you'll be able to see for yourself. And I hope then, when the site's tidy and green and quiet, you will be able to see.

**- But you did say in the previous meeting to a lot of people here that you would give that a year to be up and running before you started on this one.**

Jan - I can't recall...

**- Well it was said.**

**- We would like to see some evidence that it is running properly and is OK before you start on this other project.**

Jan - I think we will be able to do that.

**- Not just a couple of months, it wants to be over a couple of years over wintertime, you want a full cycle over a couple of years. Then come back to us.**

Hugh - I think we completely hear, we all hear what you're saying, we've said that. Just to explain on the timeline now: because of the delays in what needs gathering just in terms of information, we aren't going to be expecting to make a planning application until the back end of 2023 or early 2024 for the Nenthead scheme. The determination period for that is a minimum of four months but, you know for Hags it took a year. It will take a period of time before we would be able to even think about starting to build the Nenthead scheme. And if we find that when we're operating the Nent Hags scheme, that it doesn't work in the way we're expecting it to work, then obviously we would not build the Nenthead scheme in the same way because we would learn from that. We don't believe we're going to need to change the design of the Nenthead scheme because we are completely confident that the Hags scheme will operate as we designed it. But we will have the benefit of operating it, I imagine at least a year before we even have planning permission, let alone when we're ready to build something at Nenthead. Now, those timelines...the exact dates, they're not fixed in stone at this point but just to give you, hopefully some confidence that we're not going to be building the Nenthead scheme in the near term, or in the next year because of the need to get permissions and finish the design and all that kind of thing. So, we will have the opportunity to clearly show how Hags is working.

Jan - Everybody has welcomed that, I know the community wanted to see that. Everybody has suggested that that is welcome.

**- I was just going to say is that what you're really aiming to get is the confidence of our community aren't you, not your confidence in an experimental project. And also in this time that you're waiting to see that Higgs works, if an alternative and a more environmentally friendly solution is developed, would you be looking at that?**

Hugh - We are continually looking at all the latest R&D that is being done by academics, both in this country and round the world. And, I have to say that right now I think it would be unwise of us to come forward and propose to the community that we would be building a multi-million pound scheme that will deliver many environmental benefits, it would be unwise of us to propose that on the basis of an experiment done in a smaller volume than this microphone here in a laboratory.

**- But this is an experiment.**

Hugh - It is not an experiment like that. It's a proven technology that works...

**- In certain places, not necessarily here.**

Hugh - ...and the alternatives that have been proposed by some members of the community, the kind of university research, it is simply not a viable technology at any scale at this stage as they have acknowledged in their paper. It will take years of research before you can work it out, and even then, the carbon footprint of that system is completely unknown at this stage.

Nick - Just backing up what Hugh was saying in terms of, we are across all of this process. That Cardiff University research, that research was part of what's called the "Metal Solver" project and that is a project with which the Coal Authority is a partner. So, we are very aware of what's going on and are part of that assessment process.

**- When it goes to the planning, where does it go exactly?**

Jan - The planning authority for this scheme would be Cumbria County Council. We understand that there's going to be the split. It would go to the Westmoreland and Furness half of the county and with any substantial planning application, there are statutory consultees, of which there are a lot of people are consulted, such as Environmental Health, Environment Agency, Eden District Council, there is a whole suite of people who will be consulted, water companies, utilities – a whole raft.

**- It actually seems as though this scheme is just going to go ahead regardless of what anybody says or does or...it's going to happen regardless.**

Jan - I'd like it to because I'd like the river to be clean but it is not a done deal.

**- It's a done deal.**

**- And I think that's why there's less people here tonight because people are just not thinking that it's not going to do any good coming to be honest.**

**- What we're getting at really is, how can the Council planners make a planning decision about land they actually own?**

Jan - Cumbria County Council used to own the mine site but they don't any longer, that was transferred to the Nenthead Mine Society. So, they are not the title holders of the land. And your point as to whether it's a done deal, quite a lot of the work that we've done over the last six months is a direct result of some of the questions and concerns because we want to get this past the post. We want to make a robust argument for these environmental improvements. If it was the done deal that you seem to think it is, we wouldn't bother with the work.

**- The goalposts keep on moving.**

**- How many millions is this going to cost? is one question. And secondly, we all heard the Autumn Statement the other day, with cutbacks everywhere, what's the chances this money, however many millions it is being called in, and stopped for the time being and reused for such things as our ambulance here, our hospital and other projects on Alston moor, transport - which will benefit people a lot more than what the scheme will that you're proposing now?**

Nick - So, in terms of an estimated cost, obviously we haven't got a completed scheme designed yet so I

can't give you an exact figure but based on Nent Hags and based on construction inflation etc, I would estimate a construction cost at this point of between six and seven million.

**- I think you've quoted more before. - I think it was ten to twelve million last time was mentioned. I've got it written down somewhere at home. It was quite a lot. That seems quite low.**

Nick - Well, based on all our recent builds, which obviously isn't just in this area, six or seven million pounds.

**- Would you be applying for regional funding?**

Nick - Sorry, there are a few questions here. Obviously, we are in the first year of a three-year spending review period. I don't have a crystal ball and I don't have visibility beyond those three years, but once DEFRA funds something to build, it is part of this programme. They also then make provision that they will continue to provide the funding to operate that scheme into the future. The funding as part of the allocation for each spending review period, again, that's not something that we control. So, DEFRA will say, OK there's this amount for water quality as an example, there will be a certain allocation that will go to water quality agriculture, water quality sewerage, there's the WAMM programme, we're looking at metals. So, all we can do is we can allocate the funds that we've got, we can prioritise the sites that we are looking at, we've said before, the River Nent is the most metal polluted river in Northern England. So, it's a high priority site for us. Beyond the three-year spending review, you're right - I can't guarantee this. But ultimately, the current River Basin Management plans, the current Environment Act targets, which are proposed, that would indicate that there will be funding there well into the future, and this would be a high priority site.

**- I just wanted to quickly ask about the proposed site for the pump house. It looks like you favour site four, which is directly in front of our houses, which we don't want there. One, for the noise, because there will be underground noise, I can guarantee you because you can hear everything that goes up that track in them houses. And two it would devalue our houses. That's our houses directly behind it.**

Hugh - I think in terms of the noise, what we can say is that we are doing the assessment as Jan said we are getting the exact pump specifications...

Hugh - So of the four options, we've looked at them and from our point of view, it seems like it would be the least disruptive to the community and it would be the best location to put it. And that's why we are preferring that site.

**- Well I can assure you we do not want that site there. We do not.**

Hugh - OK. In terms of potential for noise, vibration and things like that, we are waiting for the exact pump specifications so we can design what we need to prevent it causing any noise, disruptive noise or disruptive vibrations. So, we need to do that. We haven't done the assessment yet to design it because we haven't got that detail but that is what we need to do. In terms of the look of it, there are things we can do to alter the look, the façade and things like that...

**- Why can't it go into the opposite corner?**

Andy - There's a part of the scheduled monument in that corner...

**- Straight over the track, below the trees?**

Andy - So, that location there is part of the scheduled monument and there's building foundations in that location.

**- Because I'd hate to think what my house is worth now and what it'll be worth when that's built right in front of it.**

Andy - We have to cover all the legislative designations and one of them is the scheduled monument.

**- It's led into my question actually, you've just said it. You can't move that particular building because it's going to go near the scheduled monument. That's correct isn't it? So, obviously where the lagoons are going to go, there's going to be another building built isn't there, which originally, on the original plans we were given back in 2019, there was two buildings which would be on the scheduled monument site. So if they can't be there, where are these proposed two new buildings going to go,**

because when you look at the plan, they'll have to go down, because that's where the chemicals are going to be housed. That's going to go on the scheduled monument site. Because that's the area you're going to be. Because you won't go uphill. That's a public area. So, how's that going to be...I know at Hags you're making that a public area but that's a very, very public area, very dark. There's only us there and we won't be policing it. That's a potential danger spot for those two buildings to be. Plus you just said you can't put something near a scheduled monument. How's that going to work?

Andy - We can put it in the scheduled monument. There's building foundation in the location that you suggested, there are building foundations that form part of the scheduled monument. So being in the scheduled monument and removing a fundamental part of it are two different things. We couldn't go and build it...we couldn't take out any of the features that form the scheduled monument. But if we're putting it in the monument area, this is for Historic England and where their consultation comes in. That's their assessment for them to make.

- But, where the building were on the plans is where the under-workings are on the...I can't think of the name for them but the tunnels that are built. So that is actually here, a scheduled monument building site... So, how's that going to work? Because actually under the 1979 act you can't...unless you go to the Secretary of State to have that done, you can't actually build on that site. So, I'm slightly concerned about where these building are going to be.

- It's one of the obligations they've signed up to for the transfer of land was not to build on it.

- Obviously you've got to have some thoughts about where these buildings are going.

Jan - There would be a requirement to have the dosing building or the odour control building. That would be a small building up near the ponds. Any development within the scheduled monument would have to have approval for scheduled monument so that would be a separate exercise that we would have to...

- Change the criteria again.

- How is this going to be powered then, do you know yet?

Jan - We have made an approach to the local power company and will probably bring in power from...

- So, you'll have an actual power cable going across?

Jan - It wouldn't be an overline cable.

- Underground?

Jan - Yes. There is one building, and that could be the building that the micro-hydro comes back and helps with power.

- You mentioned reed beds. Are you going to do an experimental reed bed because we can't grow where we are, we struggle to grow even ivy sometimes, so it's a very different thing. Reed beds are quite delicate, I mean they are tough things and they do a lot of stuff with the cleaning of water, but are you sure they're going to survive it? Will you have to do a test do you think?

Jan - One of the things that we are doing, bearing in mind the delicacy, the sensitivity of the plants, we're procuring local plant species so we wouldn't get plants...

- But we don't have reeds up here, not the sort that you're talking about. We don't have high reeds on any of our ponds up here. Not at this height we don't. So, they wouldn't be local.

Hugh - I think one of the things is we haven't decided which type of plant would need to be in that reed bed, that wetland. But clearly it needs to be something that's going to grow and there are other areas, there are ponds and reedy areas on the top fell, which do grow. We're not talking about the phragmites which is super high.

- I'm born and bred Nenthead. I don't live here now but when I was young, that was like a free area for us. We just used to roam sort of thing. And my daughter now loves to go up there for a walk. Are you

**going to fence all this area off to make it safe for children and stuff? Because really, why should you be allowed to do that? It's a free open area. And I can imagine, most of Nenthead don't want part of it fenced off. So, at what point are you going to understand that the people of Nenthead don't really want this.**

Jan - We have had preliminary discussions with the access officer of Natural England because, you're right it's classified as access land, so they are aware of our proposals. We would have to put in provisions for health and safety but it would be appropriate and proportional. It isn't our wish or desire or intention to prevent access unnecessarily on the moor.

**- But you will, won't you? It maybe isn't your wish but we will have to because of health and safety.**

Jan - The site that I can refer you to is the Force Crag site, which is in the Lake District. That is a site that is on National Trust land and again, there are two lagoons and they are delineated by a small post and wire fence.

**- They're also three miles away from an inhabited building, which is not the same as this site whatsoever. And, lots of visitors come here, lots of walkers come here specifically to walk that land. So, if there are lots of signs saying 'danger, toxic mud' and stuff like that, we're not going to be getting those visitors are we? We're not going to be promoting tourism or anything like that. It's going to lose its appeal.**

Jan - But the Force Crag site is a very well walked site. And what I was saying is that the response to safety is proportional and necessary. It's not big palisade fencing, it's not high security prison style...

**- No, it just says 'toxic, danger'...**

Jan - It's agricultural, rural...

Hugh - But, you're absolutely right, it has that big yellow sign that says 'toxic' and all that and I think one of the things we need to look at and discuss with our health and safety folk and with the council's environmental health and things like that, is what is appropriate signage up there. Because there are question marks over whether it needs that signage, given what is at that site. But we need to look at that.

**- But it's still going to be spoiled isn't it? From my childhood memories for the future generations, you are going to spoil the area.**

Jan - But on the plus side, your grandchildren will have a cleaner river.

**- Nobody has ever been ill from going in that river.**

**- They're not going to gain anything from a cleaner river, are they? People maybe further down the line are going to gain something but people of Nenthead are gaining really nothing from your plans, your designs, your concerns. They're not gaining anything from it apart from years of hell really.**

Hugh - The greatest water quality improvement and environment improvements will be in the Nent Valley. That's where the biggest change...

**- For us to drink?**

Hugh - Not for you to drink...

**- What difference will it make?**

Hugh - For the wildlife and the local environment which then benefits the wider community as well. That is where the biggest benefits will be. Because it is currently so severely polluted, which is why the green algae-covered condition it's in during the summer-times now, and that's because the river insects aren't there to graze on that algae to keep it under control, because of the metal concentration, which makes it very difficult for them to survive.

**- It's always been like that. When we were young and we paddled in the river, it was like that...**

**- Nobody has ever been ill.**

**- So, what you're doing is not in proportion enough benefit for Nenthead or the wildlife or anything. You know, your proportion, your 10% that might be good, the people in Nenthead are going to suffer the 90% and it's not worth it.**

**- If the river is so polluted, then why has the Environment Agency not got signs up everywhere? Because people swim in it, people have been swimming in it for years, there's fish and things in it. If it's so polluted, why is it just now that you're talking about it?**

Andy - It's been polluted for hundreds of years, since the mines have operated... The pollution that we refer to relates to river life. So whilst you say, people swim, people drink it, the Environment Agency are there to look after the river water quality which has an effect on aquatic life – fish, invertebrates, and the knock on effect of that through the eco-system – the birds, through all of that. Those are the standards that the Environment Agency work to. Human health standards, drinking standards, that's for Environmental Health to deal with. The Environment Agency are concerned with river water quality standards and improving water quality for the benefit of the environment. And there are significant benefits to improving, to remove the metals from the two adits, there are significant benefits to be had throughout the River Nent region, benefits to the River Nent as well as South Tyne. I appreciate you see less of, but those benefits are there.

**- I was going to say, heron fly up this river and fish in this river. They only fish in cleanish water that doesn't poison them. Frogs also only live in clean water, water they can survive in. Why is this river so polluted that...I mean, nobody's ill, you know, there are animals in it.**

**- There's the metals in the water that are the result of human activity, mining activity and I mean, that's a lot. But there was metal in the water before the mining started, before anyone even thought about mining. That's why people came to mine, because the metals were there and the aquifer's saturated with metals as well. There's always been a big bit of metal. I think...you must accept that. So, you have a massive clean up in the Nent, and the Nent will have to be disproportionately more cleaned up to produce decent water quality in the Tyne. What happens to all the metal tolerant species up here that rely on the metals to keep the competition away?**

Hugh - In terms of the metal tolerant species, they are primarily on the land and that is where the Calaminarian grasses are, the lichens and things like that. And there is an awful lot of those around. As you know, at the horse and wagon field site, we have created an area to try and encourage more of those plants to grow from the material that we took out of the river in a couple of places. And, in the work we have done at Garrigill, the culvert there, we are creating a better environment for those Calaminarian species to grow and we're trying to do more of that and we're learning from there, how to do things better here in terms of improving the vegetation on the new embankments when we rebuild them. And, also with the Nenthead carpark bankside, the approach we took there hasn't been as successful as those we took elsewhere, so that is something we can come back to look at. I think in terms of the pre-mining condition, in this country it's not possible to find any pre-mining condition. In other countries there have been water quality samples taken before people have started mining, then there was mining, then it was closed down and there is an order of magnitude difference in the harm that there will be as a result of mining activity, and that is what we are trying to address. We're not trying to make this into a sort of pristine stream that has never been mined, that's not feasible but we are trying to remove the severe harm that is done as a result of mining activities.

Andy - I think you've picked up a point there Hugh, you're right in that there may well have been a naturally higher background level of metals in the rivers across the Pennines because of the geology of the area but all of that has been made worse by man made activity, by those mining activities. And, the legislation up until 2000 was that mining operators could walk away without any responsibility for the pollution that they caused, which is why this programme has been set up to address that polluting legacy that has been left behind by all the companies that have gone before and have mined. So, we're not looking to get back to the wholly natural level, but we have a baseline of where we are now that we know what the environment quality standard is and what's feasible in making those improvements to the very worst situations that you get through the summer months when it's can be up to hundreds of times [worse] that the quality standard that we work to for other rivers. We might not get there for the River Nent but we can get there for the South Tyne and make those improvements.



**- It says you've done the geological survey and obviously you'll send that to us, but have you done a flora survey yet?**

Jan - Yes.

**- And, what's the findings on that?**

Jan - We did the NVC, National Vegetation Classification survey.

**- And that's obtainable for us to get?**

Jan - We'll upload it in the next few weeks, yes.

**- Great, thank you.**

Jan - And everything was re-done to fill in some of the gaps that had been identified.

**- And just picking up on your bird survey, there's been some missed out because we have ring ouzels here that live in the woodland opposite. They look like a blackbird and they're in the woods opposite and they nest in there and they nest in the hush, and we also have cuckoos, we had two cuckoos this year so I'm surprised, if they did the survey that they didn't hear them so I feel that the surveys that have been done haven't been very thorough for you, so I think that needs to be revisited. We also do have black grouse up here, we do have them because they come in our garden and they go in the fields opposite and they go on the fells.**

Andy - Those surveys that were done have looked at what was in the site, within the red line boundary so anything where there's no work planned...

**- But they use it as a corridor. So, when you're having wildlife surveys obviously the corridor is the feeding corridor. So, that's a really important thing to be brought up. And, yes they're obviously not going to nest on that site.**

**- And the ospreys as well.**

**- And the ospreys feed off the dam.**

Hugh - What we can do is we can feed that information back.

**- It needs to be more than just the dawn chorus ones.**

**- It was a very dry summer as well so you didn't see many reptiles but there are reptiles.**

**- So, you're doing Haggs. If you get permission to do this one, where's next? Will you do one in Alston? Will you do another one in Nenthead or is that it?**

Hugh - I think in terms of mine water treatment plants in the Nent Valley, the reason we're looking at taking both Rampgill and Caplecleugh together as a single site rather than build one for each of them, and if we could have put these waters into the Haggs site we would have done that as well, but it's just not practical to do so. We are monitoring the water quality of what comes out of the Nent Force Level down in Alston and we have been monitoring that for three or four years now.

**- Whereabouts is that then? Where do you monitor it?**

Hugh - It's just downstream of the Nent Force itself, of the waterfall so in Alston itself. Upstream of where the road goes across. So we're monitoring that. At the moment, the data – well you know the data better than me Andy, but it's quite similar to the [Nent] river water. There's a lot of mixing between the river and the mine water that comes out of there. So, we need to monitor what happens. So maybe, when we clean up the river from the treatment schemes that we're building and proposing, what comes out of there doesn't need any treatment. But we're monitoring that. We're monitoring sites in other catchments across the North-East, across the North Pennines, to see what level of pollution is coming out of them and what would be needed to do to treat them.

**- If you have to do another one before the one down in Alston, where would you propose putting that?**

Hugh - We haven't even begun to look at that yet.

Andy - At the minute, the water quality coming from Nent Force Level is nowhere near the levels that we're seeing coming out of Rampgill and Caplecleugh. So, at the moment, like Hugh said, it's similar to the river

water quality so it doesn't have a huge impact in the water that comes out of it. We will continue to monitor it but that's all we're doing at the minute. It's all relative. It's similar quality to the River Nent, and the River Nent is the second most polluted river in the country. It's not good water quality coming out of there but it's not having the detrimental impact that these are.

**- Going back to your surveys, are they independent? Who does them?**

Jan - They have been done by the ecologists who work for the consultants AECOM, who we pay, and they are consultant ecologists.

**- Are they the same ones you use all the time?**

Hugh - No. The Coal Authority has a framework with different ecologists, different sort of people on them. So, at the moment, for this project we've been using the AECOM ecologists. They work for lots of different companies and business and developers, and so they have professional standards that they need to keep up.

**- It would be nice to see some independent surveys.**

Jan - We do have our own employees who are ecologists and we don't use those for these reports because we want the distance and the transparency.

**- For the one at Hags that you hope to have running next year, how long before you actually see an improvement in the river quality?**

Hugh - As you know, there are the three ponds at Hags and then the two wetlands that come on the back end of it. Exactly how we start to operate the Hags scheme, we're still working out the fine detail of. I expect we will not treat all the water immediately, we will start with a portion of the water and so we won't get the full benefit of treating all the water immediately. But we expect that the system will be removing 70-90% of the metals within weeks of starting to put the water through the treatment system. That's been our experience at other schemes, where we've both done them at very small scale and at large scale like the Force Crag site. They start operating, working effectively very, very quickly. At that point we would see metal concentration coming into the treatment ponds and then metal concentration coming out of the treatment ponds and we would expect it to be dropping very significantly very quickly.

**- So, how many years before you can actually say in the Tyne there is no more pollution come from these mine sites?**

Hugh - Andy has done some predictive assessment of the concentrations of metals in the River Nent and the South Tyne and all the way down the Tyne. It varies very much with rainfall and then river flow. Although we could see immediately the drop in metals going into the river, we would need to be comparing particular flow events with particular flow events, before and after. So, it will be some time – months to years I would say - before we can say how much of an improvement it is doing all the way down the river. But we will be able to very clearly measure less metal going into the river very quickly.

**- You could find that the Tyne has got as much going through, which would just show that the pollution was perhaps coming from elsewhere, rather than...you know washing off the land, or...**

Andy - There will be a delay before you see the improvements right at the very bottom of the system, the Port of Tyne. The water quality improvement, like Hugh says will be relatively quick, within weeks of the treatment scheme being operational. But the monitoring that we've done so far, I've got monitoring that I've shared and I can share again – make it available, that shows metal that's come from the South Tyne and where that metal comes from. The River Nent is the majority, just about half of the metal that comes into the South Tyne system. You've got more coming from West Allen and that monitoring is in place through the flow of water quality that we do monthly, and we have done since 2013 for the South Tyne system. We know where the metal comes from and we're continuing to refine it. We know what comes from Rampgill and Caplecleugh and there are other areas there will be diffuse runoff and we continue to refine those and if there are significant sources, we can do something with, then we will look at those as and when, whichever catchment they may be, whether it's the River Nent or wherever. Once we've put these systems in place,

there will be less metal running through the system. And there is a certain amount of deposition in dry weather and that's an amount of metal that's not available in high weather to move down the system so there will be a lag effect. On rainfall, if you get a heavy rainfall through one year, there's going to be more moving down the system. There's less coming in behind it because of these treatment schemes.

Nick - Just adding to what Andy was saying, this is obviously a national programme and we do recognise that metals have not just come from these three adits. We work in partnership with the likes of Tyne Rivers Trust, within this catchment, doing lots of relatively small green engineering works to reduce the diffuse input and runoff from the land and also identify where those larger apportionments are coming in. In terms of sediments, like at the Garrigill Culvert, not just concentrating on putting in place mine water treatment schemes for the point source but also looking at the reduction of diffuse inputs as well. So, we do recognise it doesn't all come from one place and our programme is a national programme. We do this in the Wear, we obviously do this in Cornwall as well, so it's not fully centred on the Nent.

**- What about the industrial waste and agricultural waste and sewerage that contributing a huge amount of pollution in the Tyne?**

Andy - The monitoring that we carry out for this programme is centred around metal pollution and looking at those sources. The Environment Agency work more widely beyond the metal mines programme, we have colleagues that do go out and do look at a whole range of pollution and sewerage being one of those sources, agricultural sources. There are other parts of the Agency looking at exactly those. There is an agricultural team who go out and work with farmers to reduce those inputs because we recognise those are problems as well, but this programme is set up to address metal pollution.

**- Yes, I know that. But how much of the pollution in the mouth of the Tyne is from this river here, the River Nent compared with the amount that goes in further downriver?**

Hugh - In terms of the estuary sediments, the primary reason why there are difficulties is metals. There are occasionally some issues with other things, but they are very, very localised. The metals which come solely from the North Pennines are the main reason why those metals cannot be easily disposed of.

**- When will we know if you've been given permission or made up your minds that you'll go ahead with this?**

Nick - We've been talking to Nenthead Mines for a number of years obviously.

**- Cumbria County Council you were talking to, it has just been transferred over.**

Hugh - No, primarily we've been talking to Nenthead Mines before and after they took ownership. We kept in touch with Cumbria Council and they were aware of the discussions we were having but...

**- So, this must have been going on long before the mines were taken over.**

Hugh - The discussions before that were still primarily with the Nenthead Mines as the occupier of the site, looking after it on behalf of Cumbria Council. We would have conversations occasionally with the council as well. This was at the very early stage because, you'll remember we didn't look at putting something on the mine site until more recently. The conservation society have been the lead as the land owner and that was their decision between them and the council as to who should be speaking to us. I think in terms of when we will get a decision, that's not in our gift. I would love to be able to say to you right now, we're going to get a decision tomorrow and we're going to have an option to do it but that's a discussion between organisations.

**- When's Nenthead Mines actually communicating with the residents...?**

Hugh - We can't speak for them but what we can do is we can say to them next time we speak to them that we've had this session this evening and that's a question that has been asked.

**- Why aren't they here?**

**- Let's go back to this business of the rate at which things improve. Do you actually have research that looks at the question of remobilisation? For example, you take out half the metals from the water, you're making room for metals coming off sediment...if you take the metals out here you're making room for them as the thing runs through the highly polluted sediment in the river on the way down to the Tyne. You might end up, once you go a couple of miles further downstream you've actually got just as much, it's come back in again.**

Hugh - The amount of metal that goes down the system is a function of how much metal goes into the system. Then that metal gets stored in the river channel, and then ultimately get re-mobilised and goes down. We can stop metals going into the river system itself from these mine water discharges and diffuse things where we can and that just takes out some of the reservoir [of metals] that will end up in the river, that is in the river. There is hundreds of years of contributions of metals going into that system, so there is a lot of metal in that system, particularly a long way further down. All we can do is stop new metal going in. And actually it is kind of opposite to what you're suggesting – if you stop metal going in there, there's more reactive sites in the river, which aren't full of metal so when more metal comes in, it can suck that out of the water column and hold it in the bottom of the river in the sediments.

**- OK, but do you have stuff about this? Research?**

Hugh - Research has been done independently of us and partly with us, certainly by Newcastle University, also by Durham University and others which has looked at the whole issue of re-mobilisation of metals in mining impacted catchments.

**- Thank you.**

Simon - Thank you very much indeed for all your questions and comments and thank you also to the team for being here to answer them. One of the things that I'd just like to draw to your attention and if you could also pass this on, is that there is a survey which is on the tables, which also has a QR code which is basically asking about how you wish to be engaged including through the drop-in and so on. So, if you could complete those and put them in the box, but also encourage others to complete those because it would be great to have as many views as possible. Having said that, thank you very much indeed. I would also like to thank the Coal Authority and the Environment Agency because they got the tea and biscuits. Hope to see you again sometime, thank you very much indeed.

Nick - Sorry, can I just add one thing. I know that some of you had some questions on paper written down and we did make a commitment that if we didn't get around to them, I would be happy to address them. If anyone else has any other questions we obviously respond to queries on the email so feel free to contact us.