

Visualisation Viewpoint 9

From junction between A689 and Carrshield road

Now



BASELINE

AECOM

Visualisation Type: 4
Projection: Cylindrical
Engagement Factor: 100%
Paper Size: A1
Date / Time: 18/03/2019 11:40

Camera:
Lens: Canon EOS 6D
Horizontal Field of View: 90°
Direction of View: SW
Location: E378623_1643417

Canon EOS 6D
Canon 50mm
90°
SW
E378623_1643417

Ground Level: 532.2m AOD
Distance to Site: 137m
Height of Camera: 1.5m

Note:
Images to be viewed at a comfortable arm's length.

NENTHEAD MINE WATER TREATMENT SCHEME
Viewpoint 9

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1 year after construction is complete



PROPOSED YEAR 1 PHOTOMONTAGE

AECOM

Visualisation Type: 4
Projection: Cylindrical
Engagement Factor: 100%
Paper Size: A1
Date / Time: 18/03/2019 11:40

Camera:
Lens: Canon EOS 6D
Horizontal Field of View: 90°
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3 years after construction is complete



PROPOSED YEAR 3 PHOTOMONTAGE

AECOM

Visualisation Type: 4
Projection: Cylindrical
Engagement Factor: 100%
Paper Size: A1
Date / Time: 18/03/2019 11:40

Camera:
Lens: Canon EOS 6D
Horizontal Field of View: 90°
Direction of View: SW
Location: E378623_1643417

Canon EOS 6D
Canon 50mm
90°
SW
E378623_1643417

Ground Level: 532.2m AOD
Distance to Site: 137m
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NENTHEAD MINE WATER TREATMENT SCHEME
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Visualisation Viewpoint 12

From above Nenthead

Now



BASELINE		Visualisation Type: 4 Projection: Cylindrical Enlargement Factor: 100% Paper Size: A1 Date / Time: 19/03/2019 12:30	Camera: Lens: None Horizontal Field of View: 90° Direction of View: SE Location: E379284_N643840	Canon EOS 6D Canon 50mm SP SE E379284_N643840	Ground Level: 437.2m AOD Distance to Site: 347m Height of Camera: 1.5m	Note: Images to be viewed at a comfortable arm's length.	NENTHEAD MINE WATER TREATMENT SCHEME Viewpoint 12
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1 year after construction is complete



PROPOSED YEAR 1 PHOTOMONTAGE		Visualisation Type: 4 Projection: Cylindrical Enlargement Factor: 100% Paper Size: A1 Date / Time: 19/03/2019 12:30	Camera: Lens: None Horizontal Field of View: 90° Direction of View: SE Location: E379284_N643840	Canon EOS 6D Canon 50mm SP SE E379284_N643840	Ground Level: 437.2m AOD Distance to Site: 347m Height of Camera: 1.5m	Note: Images to be viewed at a comfortable arm's length.	NENTHEAD MINE WATER TREATMENT SCHEME Viewpoint 12
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3 years after construction is complete



PROPOSED YEAR 3 PHOTOMONTAGE		Visualisation Type: 4 Projection: Cylindrical Enlargement Factor: 100% Paper Size: A1 Date / Time: 19/03/2019 12:30	Camera: Lens: None Horizontal Field of View: 90° Direction of View: SE Location: E379284_N643840	Canon EOS 6D Canon 50mm SP SE E379284_N643840	Ground Level: 437.2m AOD Distance to Site: 347m Height of Camera: 1.5m	Note: Images to be viewed at a comfortable arm's length.	NENTHEAD MINE WATER TREATMENT SCHEME Viewpoint 12
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Visualisation Viewpoint 10

From quarry track at A689

Now



BASELINE

AECOM

Visualisation Type: 4
Projection: Cylindrical
Enlargement Factor: 100%
Paper Size: A3
Date / Time: 19/03/2019 11:54

Camera:
Lens: Canon 50mm
Horizontal Field of View: 90°
Direction of View: S
Location: E378635, N643889

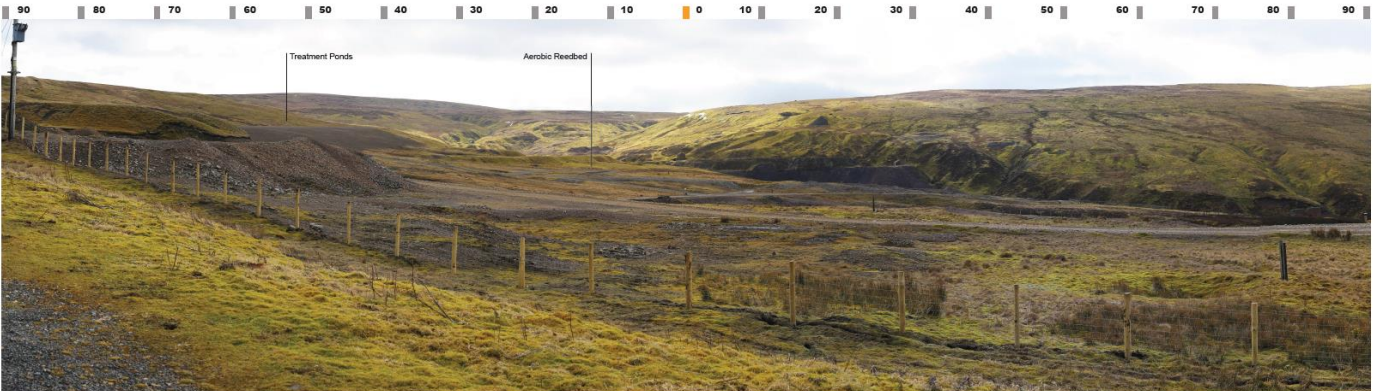
Canon EOS 6D
Canon 50mm
90°
S
E378635, N643889

Ground Level: 503.3m AOD
Distance to Site: 317m
Height of Camera: 1.5m

Note:
Images to be viewed at a comfortable arm's length.

NENTHEAD MINE WATER TREATMENT SCHEME
Viewpoint 10

1 year after construction is complete



PROPOSED YEAR 1 PHOTOMONTAGE

AECOM

Visualisation Type: 4
Projection: Cylindrical
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Height of Camera: 1.5m

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NENTHEAD MINE WATER TREATMENT SCHEME
Viewpoint 10

3 years after construction is complete



PROPOSED YEAR 3 PHOTOMONTAGE

AECOM

Visualisation Type: 4
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NENTHEAD MINE WATER TREATMENT SCHEME
Viewpoint 10

Visualisation Viewpoint

From Hilltop Cottages

Now



1 year after construction is complete



3 years after construction is complete



Keeping In Touch

We are keen to hear your thoughts about the proposals and help you stay up to date with the project.

You can do this by:



Signing up to our [email newsletters](#) by leaving your email details with a member of the project team here today.



Checking out our [website](#) at - <https://consult.environment-agency.gov.uk/north-east/nenthead-mwts/> or by scanning the adjacent QR code



Asking [any questions](#) via nent@coal.gov.uk or calling 0345 762 6848.

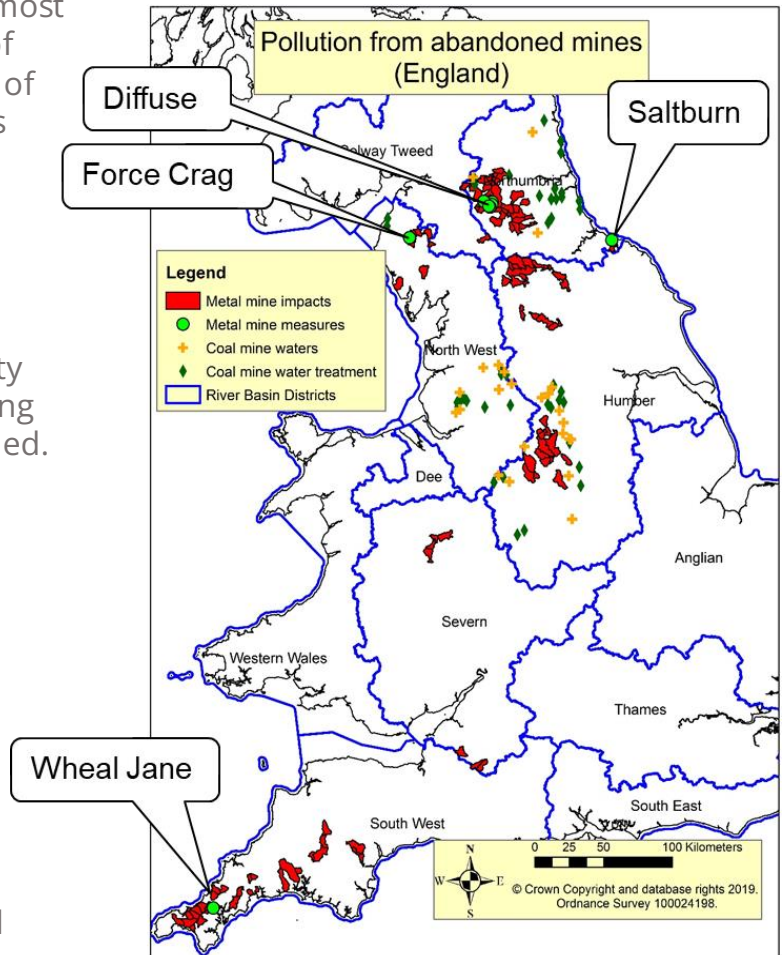
We will also continue to post details of key updates relating to the proposed scheme to properties in Nenthead.

The WAMM Programme

Britain has a long industrial history of mining for minerals. Despite most mines closing towards the end of the 19th Century, about 1500km of rivers are still polluted by metals such as cadmium, lead and zinc. These metals cause harm to fish and other river wildlife.

Before 2000, mines could be abandoned with no responsibility on the owner to deal with ongoing water pollution after mining ended.

If Government does not take action, thousands of tonnes of metals will continue to pollute rivers for hundreds more years. The WAMM programme was set up by the Environment Agency, the Coal Authority and the Department for Environment, Food and Rural Affairs (Defra) to tackle this polluting legacy of the industrial revolution.



Map showing the main areas in England affected by metal mine discharges

The WAMM Programme supports the Government's 25 Year Environment Plan which aims to improve the environment within a generation and leave it in a better state than we found it.

Pollution from abandoned metal and coal mines is one of the top ten challenges for the water environment. The WAMM Programme will help achieve the objectives of statutory River Basin Management Plans to clean up polluted rivers by 2027.

The Government has recently proposed long-term targets under the Environment Act 2021. One of the water targets is to halve the length of rivers polluted by metals from abandoned metal mines by 2037. The WAMM Programme is the main mechanism to achieve this target.

Our Responsibility to the Environment

We all have a responsibility to our environment, and this is becoming more and more prominent as we understand more about the impacts our activities have on our planet.

The way we think about our environment is changing and it's changing for the better. More and more people are getting involved in initiatives such as beach cleans, reducing the amount of plastic they use, cutting down on waste, making better transport choices and using our spaces better to support wildlife.

There is more we can do though, and the new Environment Act will deliver the biggest legislative changes since 1995, addressing the government's ambition to leave the environment in a better state.

The Act focuses on 4 key areas of change. Within this is a commitment to improve water quality standards in our rivers. The WAMM programme has a big role to play in this.

Proposed Environment Act target

"By 2037, halve the length of rivers polluted by metals from abandoned metal mines."

The WAMM Programme

The WAMM programme aims to clean up the 1,500km of English rivers that are polluted by abandoned metal mines, in support of the Government's 25 Year Environment Plan and statutory River Basin Management Plans.

It's the only programme that will help to meet the government's proposed target to remove metal pollution from our rivers.

Reducing Waste

Improving our Water Quality

Protecting Nature and Biodiversity

Improving our Air Quality



Tell us your thoughts

Use sticky notes or write directly on the paper below.



Water and Abandoned Metal Mines (WAMM) programme
Cleaning up rivers polluted by abandoned metal mines



Tell us your thoughts

Use sticky notes or write directly on the paper below.



Water and Abandoned Metal Mines (WAMM) programme
Cleaning up rivers polluted by abandoned metal mines

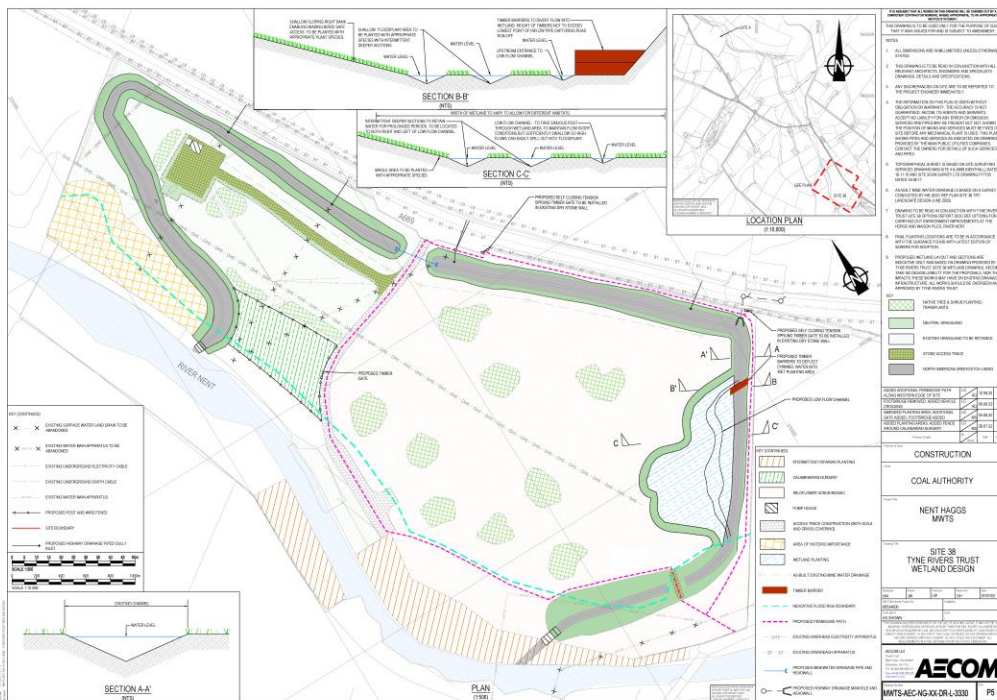


Nent Hagsgs Scheme

Proposed improvements to Horse and Wagon field

At Site 38 (also known as the Horse and Wagon field) which contains the mine water pumping station, we have been working with Tyne Rivers Trust to improve and enhance the field for wildlife and local residents.

Work began in August 2022, funded by the WAMM programme and Northumbrian Water's South Tyne Holistic Water Management Project. We have discussed the proposals with local residents, the North Pennines AONB Partnership and Cumbria County Council.



The plans, detailed above, include planting meadow grasses and trees along with creating a wetland in the swale that helps to take surface water from the A689 to the river.

Having conducted groundworks and seeding in the Summer, we have recently been planting wildflowers, shrubs and trees as this works better in the colder months. Some of this involves slow growing specialist calaminarian (metal-tolerant) plants.

By Spring 2023, we expect that the site will look more vegetated with a greener appearance after the initial growth has taken place.

The long-term management of the site will be carried out by the Tyne Rivers Trust and their volunteer network.

Nenthead Pumping Station

Proposed new location in the car park

We need to build a pumping station to house the pumps that will transfer the metal polluted water from the Caplecleugh and Rampgill adits up to the treatment ponds. Based on feedback on our original proposal, we have looked at four alternative locations in the Nenthead car park for the pumping station.

Our engineering consultants took account of the historical heritage in the area, proximity to houses, and engineering requirements. All four locations were considered suitable,



www.googlemaps.com)

Location 4 is our preferred site for the pumping station

This location is close to both mine water adits so the length of pipework required is shorter which should mean less disruption.

Although within the Scheduled Monument, we believe that with careful design and construction, this will be acceptable to Historic England.

We need to ensure the pumps do not cause noise for local residents and wildlife. We have carried out a baseline noise survey to compare with the expected noise from the pumps. We will design the building so that the noise from the pumps is minimal by using sound insulation if needed.

We want the building to reflect the local character and would welcome feedback on what is important to local residents.

A summary of the advantages and disadvantages of the other three sites is shown below:

Location 1

- Close to existing utilities
- Length of pipework required (shortest)
- Close to mine water adits
- Within Scheduled Monument (including drainage infrastructure)
- Close to existing private buildings
- Loss of existing grassed area

Location 2

- Outside the Scheduled Monument area
- Longer pipework required
- Visible from Nenthead village
- Potential impact on Grade II listed buildings nearby
- Impact on already completed diffuse pollution work
- Loss of parking spaces and grassed area
- Close to existing private buildings

Location 3

- Outside the Scheduled Monument
- Close to existing utilities
- Longer pipework required
- Visible from Nenthead village
- Potential impact on Grade II listed buildings nearby
- Minor loss of grassed area

We want to hear more about how the car park is used so that we can plan how to minimise disruption to the public when we are building the pumping station and associated pipelines.

The River Nent: fish surveys

Environment Agency monitoring

Between 2017 and 2019, the Environment Agency monitored fish and invertebrate (river fly) populations along the River Nent to provide baseline data for the WAMM project.

Monitoring was undertaken at several locations along the River Nent, as well as from the Deepdale Beck, a tributary of the River Tees, which is similar to the Nent except that it isn't polluted by abandoned metal mines.

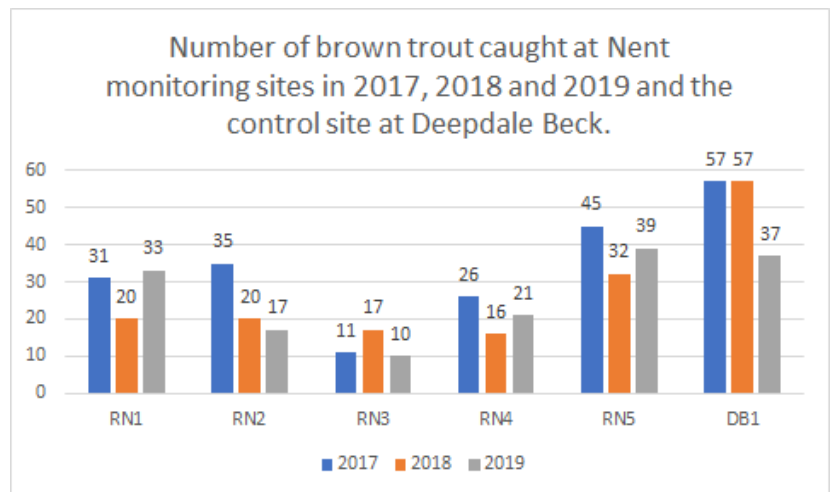
Results

In Deepdale Beck, we found a diverse fish population with Brown Trout, Atlantic Salmon, Grayling, Bullhead, Stoneloach and Minnow recorded, as well as a healthy river-fly population.

Across the 3 years, the only fish found in the River Nent were Brown Trout (migratory fish like salmon are not expected because the Nent Force waterfall is a natural barrier). There were only about half as many trout in the Nent compared to the Deepdale Beck. We found no juvenile fish (less than a year old) in the main River Nent channel and we believe this is because the younger fish live in tributaries where the metal concentrations are lower.

This graph shows the number of fish recorded at the 5 sample sites along the River Nent, and the control site on the Deepdale Beck.

It is likely that these populations have developed some tolerance to the extremely high levels of zinc, cadmium and lead which would normally be acutely toxic to fish.



A similar story was found for river-flies with the surveys recording a lower number and less diverse population. Overall, these results illustrate that aquatic wildlife in the River Nent is heavily impacted by the high metal concentrations and is less resilient and abundant than in similar un-polluted rivers.

Nenthead Scheme Proposals

Progress Update: November 2022

Over the past few months, we have been gathering more information to help us to develop the proposed treatment scheme to clean up mine water released from the Caplecleugh and Rampgill Levels. We are continuing to explore different design options for various elements of the scheme.

The Weather Station

In August 2022 we installed a weather station on the former Nenthead Mine site to measure wind speed and direction, temperature, atmospheric pressure and rainfall.

We chose to do this after listening to the concerns of residents that the nearby long-term Met Office weather station at Warcop did not fully reflect the unique climate of Nenthead.

When we update the odour modelling assessment in 2023, we will compare data from this new weather station with the Met Office record from Warcop to ensure the model reflects local conditions.

We will also ask our air quality consultants to address specific concerns raised by residents about the potential impacts of temperature inversions and other weather phenomena that may occur at Nenthead.



Weather station on the former Nenthead Mine site

The Footbridge to Caplecleugh Level

We are continuing to investigate the best options for a replacement footbridge to support the pipe needed to carry mine water the Caplecleugh Level to the pumping station before being transferred up to the treatment ponds.

We expect to be able to share more details on this in spring 2023.

Surface Water Run Off Assessment

We know that metals washed out of the old mining wastes also contribute to pollution of the River Nent although this 'diffuse pollution' causes much less environmental harm than the metals released by mine waters.

We are looking at what we can do to keep clean water away from the metal contaminated wastes and important historical features. As well as controlling river pollution, this should help preserve the nationally important industrial archaeology at the site.

We expect to be able to share more details on this in spring 2023.

Nenthead Scheme Proposals

Key Elements of the Mine Water Treatment Scheme

Building a mine water treatment scheme will clean up the severe river pollution in the River Nent caused by metals flowing out of the Caplecleugh and Rampgill Levels.

Preventing metals such as cadmium and zinc from entering the watercourse will significantly improve water quality in up to 60km of the Nent and South Tyne rivers.

Cleaning up the rivers will decrease the existing damage to fish and river-flies and make the aquatic wildlife more abundant and resilient.



Caplecleugh Level

The Pumping Station

The pumping station is needed to transfer metal polluted water from the Caplecleugh and Rampgill Levels up to the treatment ponds.



We recently carried out a baseline noise assessment near our preferred pumping station location in the Nenthead car park.

We monitored noise at two locations for 2 hour periods during the day and at night. The current noise levels were 46 to 52 dB (decibels) by day and 41 to 49 dB at night. The River Nent was the dominant noise source.

We will use this information to design the building so that the pumps do not cause a noise nuisance to local residents and wildlife.

The Mine Water Pipeline

Pipeline will be installed to take the mine water up to the treatment ponds and then return the treated water back to the river. Our current proposal is to put this beneath the track that runs from the carpark up to the mine site where possible.

We need to carry out a CCTV survey of the old water pipeline that lies underneath the access track from the Nenthead car park to Handsome Mea reservoir. We expect our contractors to do this survey in the coming months. If we can use the existing pipeline to transfer water to the treatment ponds, this will reduce the amount of construction required on the site.

Nenthead Scheme Proposals

Key Elements of the Mine Water Treatment Scheme

The Treatment Ponds

We are proposing to build two open-water treatment ponds to the east of the Handsome Mea reservoir. The total surface area of water in the treatment ponds will be a bit smaller than the reservoir.

We will be treating up to 20 litres per second of mine water which will make a huge improvement to water quality, particularly at lower river flows when the environmental damage is worst.

Since May 2022, we have moved the treatment ponds slightly to the south and changed the layout so that the treated water comes out further away from the village. This will help to minimise the risk of potential odour nuisance.



Handsome Mea reservoir

The Reedbeds

Reedbeds make sure the water coming out of the treatment ponds contains plenty of oxygen before it is put back into the river. They also increase biodiversity and capture carbon dioxide.

We are reviewing the location and size of the reedbeds and whether alternatives such as aeration cascades would be more effective.

Protecting the local environment

The scheme is being designed to take account of local protected habitats and species such as the calaminarian (metal-tolerant) plants that are so distinctive of the North Pennines and are a priority biodiversity habitat.

We carried out more ecological surveys during 2022 to better understand the current condition of plant species and wildlife. This will help us make sure we can build the mine water treatment scheme whilst minimising the impact to the unique ecology in Nenthead.



You Said, We Listened

You said

You are concerned about the impacts of construction and traffic disruption in the village.

What we've done

We have committed to sharing with you a draft construction and traffic management plan as soon as possible.

You said

You were concerned about the meteorological data we were using.

What we've done

In August 2022 we installed a temporary weather station on the Nenthead Mine Site to gather site specific data.

You said

You are not clear about how we selected the site to build the scheme on.

What we've done

We have updated the summary of our site selection to make this clearer and provide more information about the process.

You said

Ecology surveys should be done during different times of the year to reflect the higher altitude conditions in Nenthead.

What we've done

Throughout 2022 we have updated our ecological surveys to reflect the climatic conditions in Nenthead. We have brought this information to share with you today.

You said

You are concerned about the noise from the pumping station.

What we've done

We have agreed to determine the detailed pump specification earlier than originally planned. We can then design the pumping station building so that we can explain why it will not cause a noise nuisance.

We have also carried out a baseline noise survey and will repeat it when river flows are lower and so it will be quieter (most of the background noise is from the River Nent).

You said

You would like us to share information about the project better.

What we've done

We have held monthly informal drop-in sessions at the Hive since August. We hope this is helping people to hear more about the proposed scheme.

We are committed to holding a formal community event on a weekend in spring 2023.

You said

Could we install the required pipeline under the river.

What we've done

We asked our engineering experts to investigate whether we could install the pipeline from the adits to the treatment ponds in the river channel rather than in the track.

They concluded that it would be so expensive and there are so many technical challenges that it is not viable.

You said

You are concerned about the impact of construction on red squirrels.

What we've done

We have been in contact with the local red squirrel group and have seen the red squirrels. We will explain how we intend to minimise impacts of construction activities earlier than we would normally do in a project. We will provide more information in the spring.

You said

You are concerned about odour from the treatment scheme.

What we've done

We have moved the treatment ponds further away from houses.

Our modelling assessment shows that any emissions of hydrogen sulphide will be considerably below levels set by WHO to protect human health.

You said

You want to see the Nent Hagsgs scheme operating before we build a scheme at Nenthead.

What we've done

We have chosen to delay submission of a planning application so we can gather more information. This also means the Nent Hagsgs scheme will be operating before we submit the planning application for the Nenthead scheme.

Summary of Nenthead Ecology Surveys 2022

Ecology Survey	Survey Scope	Date	Summary of Results
Phase 1 Habitat survey	Phase 1 Habitat survey in accordance with standard JNCC (2010) methodology of all land within and adjacent to the Site boundary.	April 2022	Mosaic of interesting plant communities identified including calaminarian grassland on former mine workings. Update to previous survey reaffirmed findings of 2018 Phase 1 habitat survey.
Botanical Survey	National Vegetation Classification (NVC) survey.	August 2022	<p>Unimproved acid grassland – dominant habitat within Site boundary.</p> <p>Unimproved calcareous grassland (UK Priority S41 Habitat) – occurs as short grassland turf on areas where the limestone geology comes near to the surface.</p> <p>Calaminarian grassland (UK Priority S41 Habitat) – associated with areas of historic mine disturbance and spoil deposits, and around car park.</p> <p>Marsh/ marshy grassland – small areas of rush dominant vegetation within the acid grassland where surface water run-off is naturally channelled.</p> <p>Acid/ neutral flush (UK Priority S41 Habitat) – abundant bog-mosses, hare's foot cotton grass, heather and crowberry present in one small area of that surveyed.</p>
Breeding birds	Five walked transects; four of which commenced at sunrise to identify black grouse lekking behaviour.	April – June 2022	<p>None of the bird species cited in the North Pennine Moors Special Protection Area (SPA) were recorded as breeding, and so the land in the survey area is not currently in use by these species, and the habitats are not 'functionally linked' to the SPA. The relevant species are hen harrier (<i>Circus cyaneus</i>), merlin (<i>Falco columbarius</i>), peregrine (<i>Falco peregrinus</i>) and golden plover (<i>Pluvialis apricaria</i>). This reaffirmed the findings of the 2018 breeding bird survey. No black grouse observed.</p> <p>Forty species recorded in total – 9 confirmed breeding, 16 probably breeding, 11 possibly breeding, 4 non-breeding. The confirmed breeding species were Red grouse, Oystercatcher, Curlew, Great tit, Willow warbler, Blackbird, Robin, Dipper, Meadow pipit. The survey area is considered to be of local ecological importance.</p> <p>Breeding birds are of local ecological importance but the proposed development is not considered likely to cause significant impacts.</p>
Great Crested Newt (GCN)	eDNA presence/ absence survey of seven waterbodies.	June 2022	All survey samples returned negative results for GCN eDNA. This reaffirmed the findings of previous eDNA surveys undertaken at the Site in 2018/ 19.
Reptiles	Presence/ absence survey using artificial refugia.	May – August 2022	<p>No reptiles recorded. This reaffirmed the findings of a reptile survey undertaken at the site in 2019.</p> <p>Anecdotal report that common lizard is present. There is also extensive suitable habitat for slow worm and adder. Precautionary assumption that all three species may be present based on habitat suitability.</p>
Otter	Presence/ absence survey.	June/ July 2022	No field signs recorded. Transient/ passage otter presence assumed, as the species has been recorded on downstream sections of the Nent.
Water vole	Presence/ absence survey.	June/ July 2022	No field signs recorded. Species considered likely absent.
Red squirrel	Incidental observations during survey work.	Spring/ Summer 2022	Local residents report red squirrels are found in the woodland by Hilltop Cottages. Presence confirmed through observations of red squirrel in woodland close to car park.
Bats	No surveys undertaken to date.	N/A	<p>The mine adits are potentially suitable for bat roosting, and there are records of bats using adits nearby.</p> <p>Further surveys to be undertaken when the Scheme is further defined, should there be potential for impacts on bat roosting habitats.</p>

Nent Hagsgs Mine Water Scheme

Progress Update, November 2022

The Nent Hagsgs mine water is an important reason why 60km of river is polluted by metals, and releases about 3 tonnes of zinc and cadmium each year. The mine water treatment scheme, which will remove at least 70% of the metals from the mine water, is due to be completed in spring 2023.



The Pipeline and Pumping Station

Mine water flows by gravity in a buried pipeline from the Haggs adit in Nentsberry to the pumping station on the Horse and Wagon field (site 38). It is then pumped to the treatment ponds near Foreshield Bridge.

We have installed approximately 2.3km of pipe to take the mine water to the treatment ponds.

The Treatment Ponds and Reedbeds

The treatment ponds have been lined and the basal drainage layers installed. Next spring, we will place the reactive media which is a mixture of limestone, wood bark and barley straw.

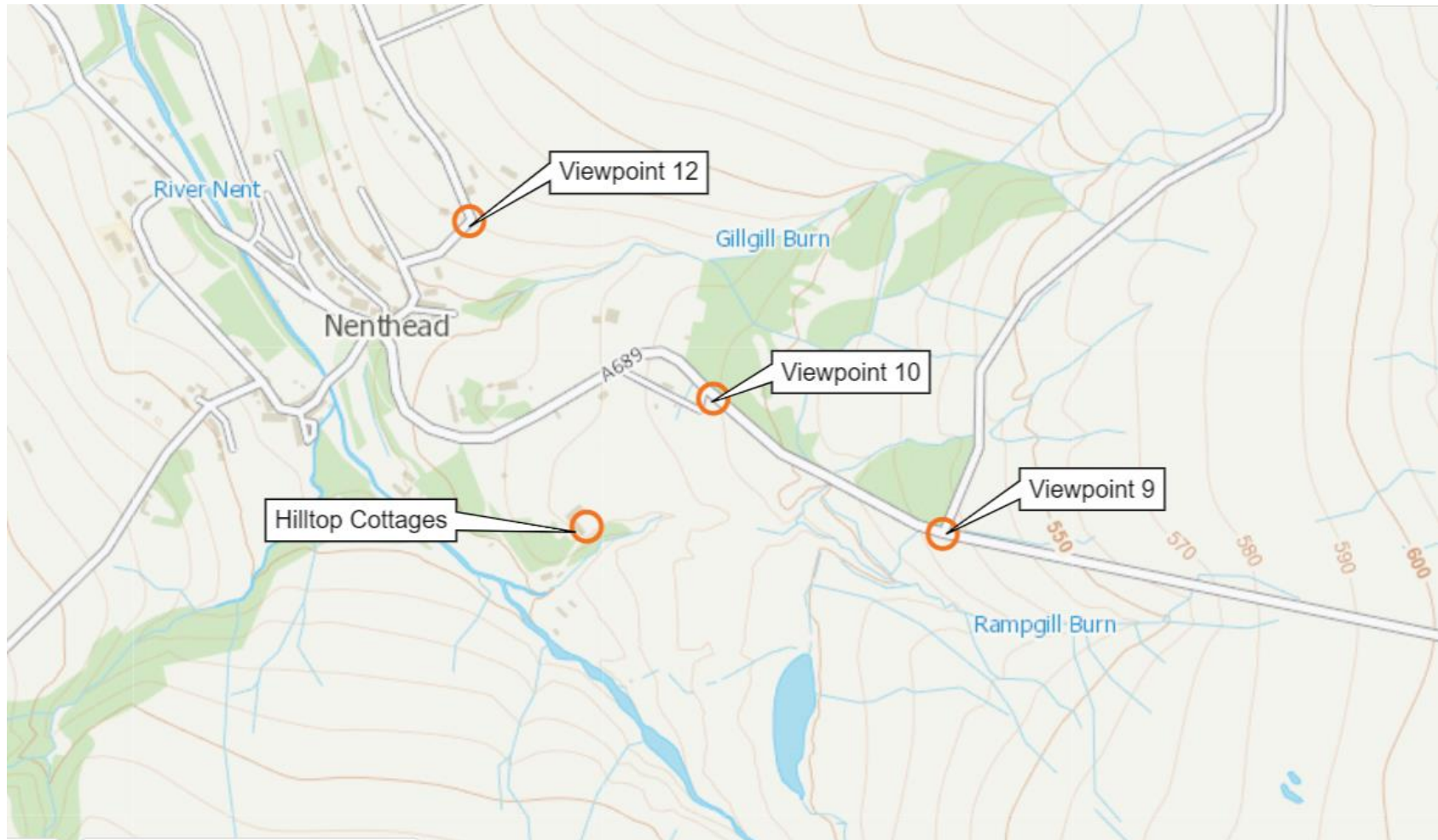
The reed bed ponds have been lined ready for young reeds to be planted before Christmas.

Over the winter we will be installing mechanical and electrical equipment, mostly inside the building.



Visualisation Viewpoints

Location Map

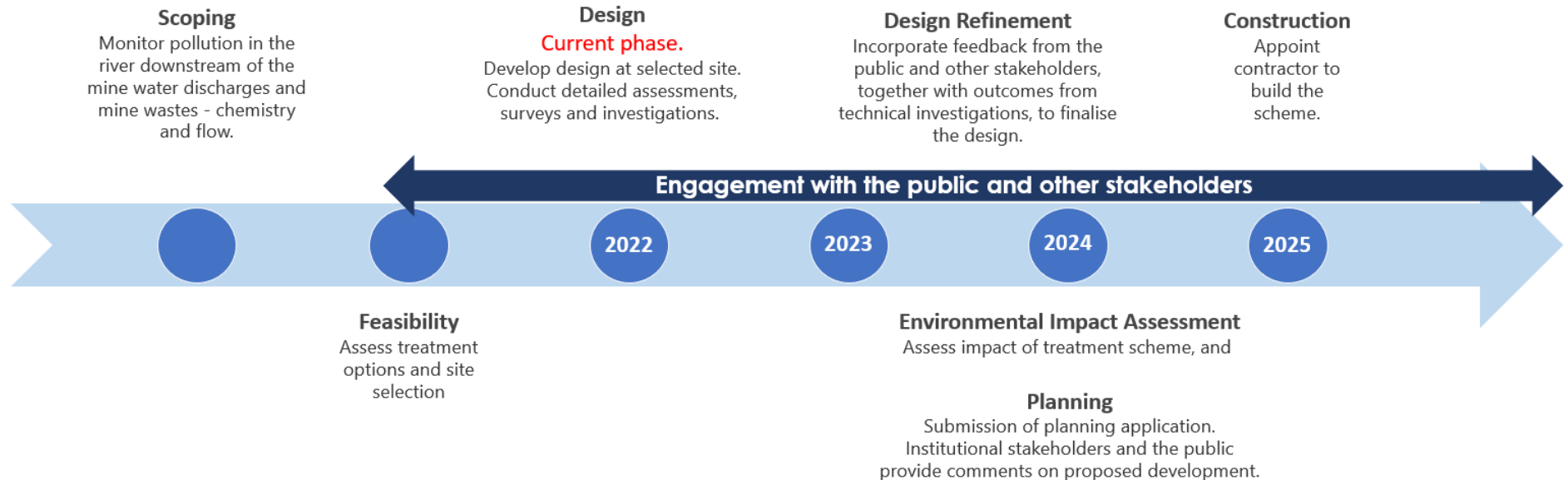


Indicative Project Timeline

subject to budget and permissions

We have now made the decision to delay applying for planning permission for a scheme until late 2023 or early 2024. This will allow us more time to gather all the data and necessary surveys to support the delivery of a mine water treatment scheme in Nenthead as we enter the final stages of designing the project.

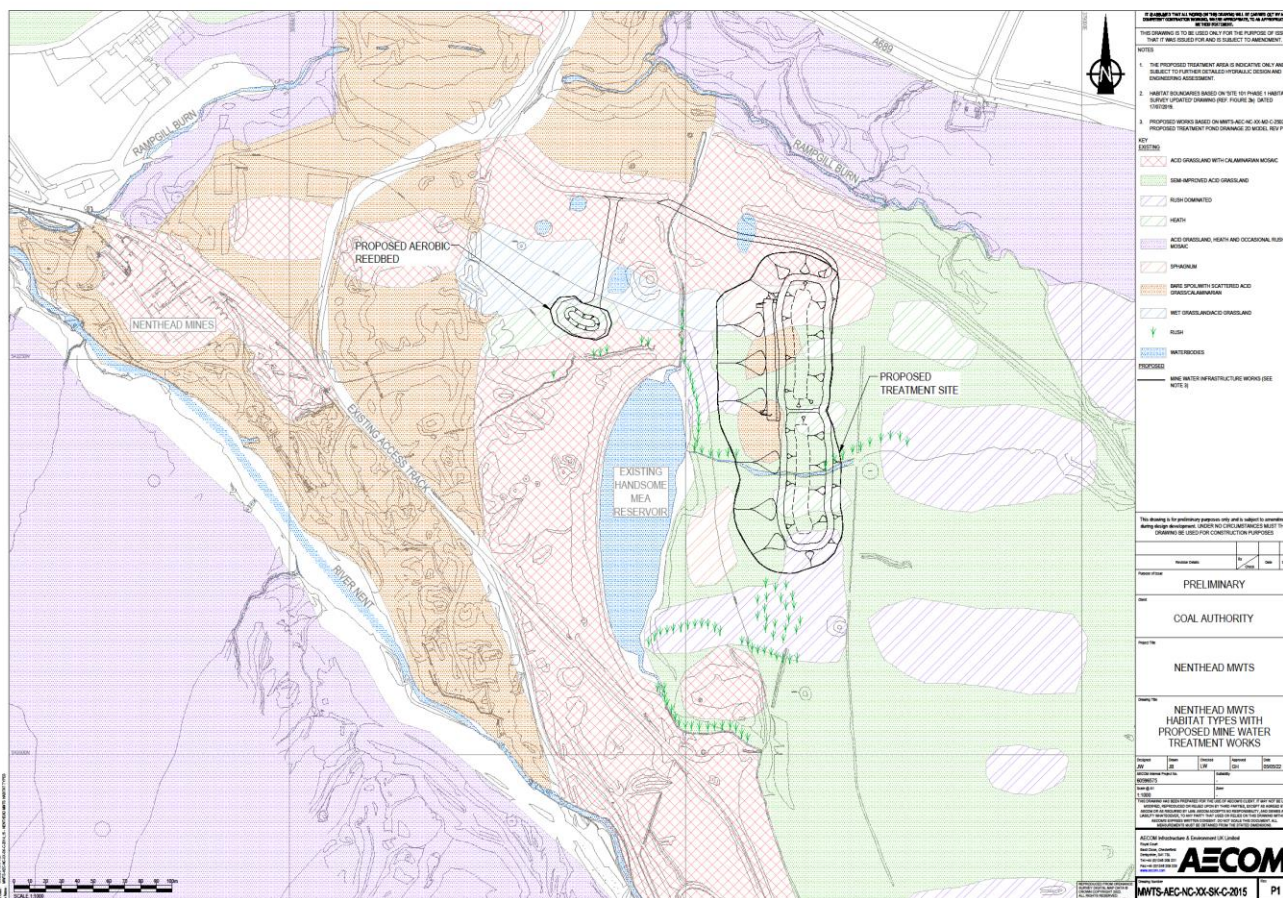
We have also taken into consideration the views of some of the local community who we know are keen to see the Nent Haggs scheme in operation prior to us starting construction on the scheme at Nenthead.



Nenthead Mine Site (Site 101)

Ecology, plants, animals and habitats

We have reviewed the information that is already available about ecological conditions at the site. We carried out new surveys during 2022 to make sure we have up to date information. If necessary, we will do more surveys in 2023. The proposed site is within the North Pennines AONB but falls mainly outside the Nenthead Mines Scheduled Monument and Site of Specific Scientific Interest. We recognise this is a special environment and want to minimise the impact of our proposed treatment scheme.



Flora

There are areas of calaminarian (metal-tolerant) grassland, rush, heath, sphagnum, bare spoil and acid grassland across the proposed site.

Fauna

Our surveys in 2022 found a number of animal species living on or close to the site including amphibians, curlew, common sandpiper, red squirrels and bats. We found Brown trout in the Handsome Mea reservoir. Our surveys in 2022 will gather more information to make sure we minimise impacts from our proposals.

Mitigating the impacts

Based on current information, our ecological experts do not believe the proposed scheme will have significant impacts on the existing environment.

We will set this out in an Environmental Impact Assessment that will be submitted with the application for planning permission.

The River Nent

River Quality

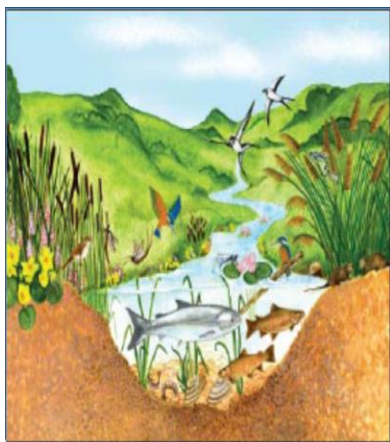
Rivers, lakes, coastal waters and groundwaters are a vital resource and support industry, wildlife, tourism and recreation. Good quality of our waters is fundamental to their continued usefulness. We need to protect them from pollution and manage them so that they reach and maintain “good ecological status” and “good chemical status”.

Under the Water Environment Regulations (2017), the Environment Agency monitors all rivers and other waters in England and compares the results to standards set by Government. The results for the Tyne catchment are published in the statutory Northumbria River Basin Management Plan. This plan explains the current condition of all water bodies, the reasons why any water body is polluted, and that usually, the objective is for all water bodies to reach good status by 2027.

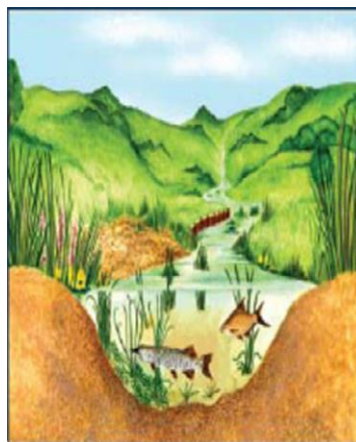
The Nent is the second most metal polluted river in England and is currently classed as poor for fish (so between moderate and bad) and moderate for invertebrates.

Through the Environment Act 2021, the Government is proposing a target that by 2037, we should halve the length of rivers polluted by harmful metals from abandoned metal mines to improve the water environment for people and wildlife.

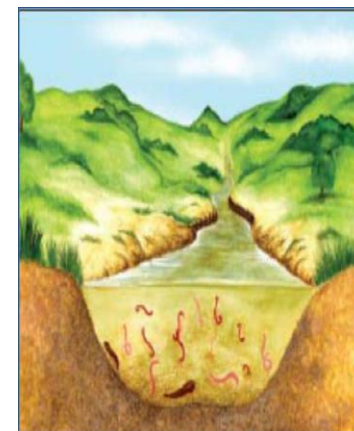
Good



Moderate



Bad



Ecology Survey Schedule

We have carried out several surveys to help us understand the existing ecological conditions at the site. The table below indicates when we carried out ecological surveys during 2022. The results from these surveys will be published when they are available. This information will be used to minimise the impacts of our proposals to address pollution in 60km of the River Nent and South Tyne.

Survey	Scope of Survey	Survey Timing - Months	Survey Frequency	Survey Extent	Programme 2022																		
					Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec									
Ecology and Biodiversity																							
Ecological desk study	Collation of existing data from online sources and Cumbria Biodiversity Data Centre.	Anytime	n/a	2km from site boundary																			
Phase 1 Habitat Survey	Phase 1 Habitat Survey in accordance with the published method (INCC, 2010). Also: Record of Invasive Non-Native Species (INNS) of plants; Incidental records of protected or priority species/ habitats or their field signs.	Apr-22	1 survey visit	Site plus a 50m buffer																			
Bat roost potential of Caplecleugh and Rampgill adits	Methodology will be based upon the Bat Conservation Trust's <i>Bat Surveys for Professional Ecologists: Good Practice Guidelines</i> (Collins, 2016).	Apr-22	1 survey visit - to be completed concurrently with the Phase 1 habitat survey	External assessment only.																			
Habitat Suitability Index (HIS) of waterbodies within 250m	Methodology based upon Oldham et al (2000). To be completed during Phase 1 habitat survey	Apr- 22	1 survey visit - to be completed concurrently with the Phase 1 habitat survey.	Waterbodies within 500m of site.																			
Breeding Bird surveys	Five survey visits shortly after dawn to identify evidence of nesting species within and adjacent to the Site.	April to June 2022	•Visit 1 – Fri 8th April •Visit 2 – Thurs 28th April •Visit 3 – Fri 13th May •Visit 4 – Thurs 16th June •Visit 5 – Thurs 30th June	Site and adjacent areas where appropriate.																			
Great Crested Newt eDNA surveys	Survey by GCN licensed surveyor, with reference to Natural England eDNA sampling protocol.	Completed between 15 th May and 30 th June.	1 survey visit (daytime) to each pond to collect water samples	We have allowed for the survey of nine ponds within 250 m of the site.																			
NVC survey	Survey by experienced botanist with reference to Rodwell (2006).	Optimum season for botanical surveys.	1 survey visit - June 2022	Areas of botanical interest identified during the PH1 habitat survey.																			
Otter and Water Vole	Waterbodies and habitats to be affected by the development with reference to monitoring the Otter (Chanin, 2003).	Between April & September inclusive	Up to 2 survey visits. One visit in each of mid-April to end June 2021 and one July to end of September 2021.	Suitable habitats and watercourses 250m upstream and downstream of any proposed works. Access will be required to both banks and up to 10m from the bank edge.																			
Reptiles	Any suitable terrestrial habitat will be identified during the desk study and Phase 1 Habitat Survey. Presence/absence surveys will be undertaken with reference to guidance provided in FrogLife Advice Sheet 10: Reptile Surveys (1999).	If required: Optimal - April to October depending on the weather.	One visit to set out refugia and 7 survey visits to confirm presence / likely absence.	Suitable habitat within the site.																			
Aquatic Macrophyte survey and fish habitat walkover	Representative reaches of the River Nent and receiving watercourses, and in the reservoir. Assessment of aquatic macrophytes for WFD status equivalent, and Invasive Non-Native Species (INNS)	May - September	Single visit	Representative reaches of River Nent and receiving watercourses; Nenthead Reservoir																			
Fish eDNA sampling	eDNA survey for fish in the Handsome Mea Reservoir, River Nent and various leats (TBC) to establish fish community present	Any time (concurrent with above) Note: There is a minimum 6-8 week processing time by the external eDNA laboratory	Single visit	Handsome Mea Reservoir, River Nent and various leats (TBC)																			



NOTES
 1. PROPOSED PUMPING ROUTE IS SHOWN FOR INDICATIVE PURPOSES ONLY.
 KEY
 PROPOSED MINE WATER TRANSFER ROUTE (GRAVITY)
 PROPOSED MINE WATER TRANSFER ROUTE (PUMPED)
 EXISTING WATERCOURSE

FIGURE 4 - SITE WIDE LOCATION PLAN (DRONE SURVEY)

FIGURE 3