Panbowl Dam Project – Virtual Public Meeting Transcript

Jan. 27, 2022

View the virtual meeting recording here

Brenna Angel: Well, welcome everyone, thank you all for joining us, we are ready to start this public meeting. My name is Brenna Angel. Berry Craig and I are part of the communications team providing technical support for tonight's meeting.

There are a few housekeeping items that we want to take care of. Since this is a virtual presentation, this meeting is being recorded and will later be transcribed and posted online. Cameras and mics are only on for the presenters you will see this evening. As an attendee, your camera and mic are not on, and they will stay off during the presentation.

If you'd like to ask the question, please use the question-and-answer function you'll see it in the black bar at the bottom of your screen. There will be a designated comment and question and answer time following the presentation. If some questions require additional contact outside of this meeting, make sure we get your contact information, and the project team will follow up with you.

And depending on your screen size, you may need to minimize the video speaker's panel. If you're watching on your phone, a tablet or a laptop computer it may look different, so you may need to minimize that panel, so it does not overlap with the PowerPoint presentation. With that, I will turn it over to Corbett Caudill, Chief District Engineer for District 10.

Corbett Caudill: Thank you Brenna, I'm Corbett Caudill, Chief District Engineer for the Kentucky Transportation Cabinet Department of Highways District 10 office. Joining me tonight is Aric Skaggs, Project Manager for our office.

The purpose of tonight's meeting is to discuss the findings of the engineering study being requested in the wake of last year's historic flooding. Tonight's meeting will cover several topics of interest to the Jackson community.

We'll start with a brief video to provide an overview of the project area and the engineering study. From there, we'll go into more details about the structure of Panbowl Lake Dam, the

2021 flood and a summary of the engineering study and what we've done, along with what improvements that we've made and what's ahead for Kentucky 15.

We'll conclude tonight's meeting with a question-and-answer period.

We'll start with the project video.

Project Video:
Panbowl Lake is a geographic feature in Breathitt County that is part of what makes the city of Jackson unique.

The area around the manmade lake includes a neighborhood hospital, school, businesses and the Kentucky Transportation Cabinet's District 10 office. Panbowl Lake used to be part of the north fork of the Kentucky river, but that changed in the 1960s, with the construction of Kentucky Highway 15.

When the road was built, the lake was impounded through a series of three embankments that serve as dams, two of them on Kentucky 15, one of them on Washington Avenue.

The highway separates Panbowl from the river at the west embankment. There is a spillway riser near the east embankment, which leads to an outlet water channel that runs parallel to Kentucky 15 and under Washington Avenue by way of a culvert and flap gate.

That outlet is necessary when water levels on the lake go above a normal elevation of 713 feet.

There's a vertical pipe that connects to a horizontal concrete box culvert that runs underneath Kentucky 15 and channels the water into the old riverbed channel between Kentucky 15 and Main Street and then through the gate system at Washington Avenue and then into the main channel of the Kentucky River North fork as it exists now.

In late February 2021 extensive rainfall caused historic flooding in eastern Kentucky. The North Fork of the Kentucky River crested at just over 39 feet in Jackson, the 10th worst flood in recorded history for this community. Jackson had not experienced flooding this severe since 1984. Not only was the river level high, Panbowl Lake reached an elevation of nearly 729 feet – about 16 feet above normal. Water from the river began seeping through the west embankment causing a stability issue for the slope.

It appeared that maybe some water was flowing back from the river, back into the lake. Because you had the rushing floodwaters from the river trying to make the bend where the cut-through had been done up against the embankment.

Kentucky Transportation Cabinet personnel responded quickly to the West Embankment slip, placing sandbags and later geotextile fabric and rock to prevent further erosion.

Ultimately, the dam did not breach, and Kentucky 15 remained open to traffic.

Since that historic flooding event, KYTC initiated an engineering study to evaluate the condition of the embankments and identify possible improvements. There is also a plan to widen both Kentucky 15 and Washington Avenue, so the engineering report will be used to help inform the design of that project.

What we've tried to do is look at some short-term solutions that can be incorporated into the longer term permanent widening project that will be hopefully coming along in a few years.

KYTC has already replaced the debris gate over the east embankment riser and cleared out vegetation, as recommended by the study. With available funding, the next improvement will be a driven sheet pile ball installed at the west embankment to create a more impervious cut off from the river. Panbowl Lake remains a floodplain, but these improvements will help prevent future lakeside flooding and maintain the structural integrity of the Kentucky 15 dam.

One thing we want to do here is to ensure not only the safety of residents that live along the lake, but we have to ensure that Kentucky 15 remains a viable highway. It's a major artery from southeastern Kentucky to central Kentucky.

Corbett Caudill: As you heard in the video, Panbowl Lake was constructed in the early 1960s, as part of an Army Corps of Engineers project to cut off part of the river channel from the North Fork of the Kentucky River and the construction of Highway 15.

The lake is the remainder of the old river channel, while the two crossings of KY 15 function as dam embankments. The roadway is currently recognized as a high hazard dam under the National Inventory of Dams and is regulated as a dam by the Kentucky Energy & Environment Cabinet Division of Water.

During typical flow conditions on the North Fork of the Kentucky River, the dam holds back water for Panbowl Lake. But when the river is elevated, the dam should protect the area from flood waters coming in from the river.

Now we'll go through some of the key components that form Panbowl Lake.

We'll start with the east embankment.

The east embankment is the embankment near Citizen’s Bank. You can see the lake the top left-hand corner of the photo and the culvert near the bottom of the photo. This embankment is 975 feet long and it has a crest elevation of up to 744 feet. There are varying slope measurements, which means parts of the embankment are steeper than others. The 1.5 to 1 is steeper than the 3.3 to 1.

The next component we'll talk about is the standpipe riser.

The standpipe riser is a pipe in the lake near the east embankment that leads to the culvert running under KY 15.

This pipe has an elevation of 713 feet, which means that the normal water level of the lake does not exceed 713 feet. A metal rack over the pipe prevents large debris from clogging the culvert.

Next component that we'll talk about is the outlet channel.

Over the years there has been a lot of encroachment on the discharge channel as local landowners have backfilled parts of it to allow additional construction along KY-15.

The channel is not completely blocked, but it has significantly less capacity than the original configuration. Standing water and removal of sediment and debris to keep the channel flowing is an ongoing maintenance issue.

The next component we'll talk about is the flap gate.

Excess water from the lake flows from the east embankment culvert and along the outlet channel, then through the culvert and flap gate back toward the river.

In this photo you can see cars on Washington Avenue. KY 15 is just out of view and would be on the left of the photo. The road on the right side of the photo is Bobcat Lane. That leads to the high school, Breathitt High School.

The flap gate is circled in white. This helps keep water from flowing from the river back into the lake.

Here's a close-up of the flap gate and also have an illustration of how it works. It's hard to see the gate because it is mostly under water. Keep in mind this gate and all the other structures that make up the Panbowl dam are about 60 years old, but we did refurbish this gate about two years ago.

The next component we'll talk about is the west embankment.

The west embankment is near Jackson Inn. It separates the North Fork of the Kentucky River from the lake. It is 1,035 feet long and has a crest elevation up to 741 feet. Just like the east embankment, there are different slope measurements on either side of the road. The embankment is steeper on the river side than it is the lake side.

The embankment material.

According to road plans from the 1960s, both the east and west embankments were constructed with an impervious clay cap or blanket placed along the lakeside slopes to maintain pool levels within Panbowl Lake. The archived plans indicate the clay cap has varying thickness up to 12 feet. However, several inconsistencies in the plans were noted in an Army Corps of Engineers inspection report, so the thickness and location shown in the archived plans is considered not reliable.

Now we'll talk about the flooded event that we had last March.

In late February and early March 2021, rain and runoff into the North Fork of the Kentucky River caused water levels to rise dramatically in a short period of time. The river crested on March 1 at just over 39 feet, which is an elevation of around 736 feet at the west embankment. According to the National Weather Service, the 2021 event ranks 10th on the all-time historic floods recorded at the Jackson [river] gage. The most recent comparable flood would have been in 1984.

Here is a look at the river overflowing its banks. You can see the Breathitt High School football field at the bottom of the photo and cars driving along KY 15. Those are driving along that west embankment that we just talked about. If you look to the right football field, you see the outlet channel. Remember, normally this allows water from the lake to flow back into the river, but when the river level is too high, the opposite occurs.

You can tell from this drone picture that the flap gate at Washington Avenue generally did its job and stayed closed, because the water level is higher on the embankment closest to the river. This also means that water from Panbowl Lake had nowhere to go. The normal pool level for Panbowl Lake is an elevation of 713 feet, but during the flood event it reached nearly 729 feet.

The high water on the North Fork Kentucky River led to water seeping through the KY 15 west embankment, which caused a slope stability issue and resulted in an area of soil erosion and sloughing. Personnel from the Kentucky Division of Water Dam Safety determined that Kentucky 15 could remain open to traffic and there was no threat of the dam failing. However, out of an abundance of caution, the area was evacuated.

Sandbags, geotextile fabric and rock fill were used to make a temporary repair of the west embankment. The 2021 flood event highlighted a need to thoroughly evaluate the stability of the KY 15 embankments and identify if improvements should be made. At this time, I'll turn the presentation over to Aric Skaggs to talk about the engineering study and some of the future improvements that are planned.

Aric Skaggs: Thank you, Corbett. I'll take a few minutes to go over the investigation and analysis that were recently completed. Two reports were completed for Panbowl Lake: a geotechnical investigation and a hydrologic and hydraulic report. We may also refer to this as an H & H

report. Both reports total more than 700 pages, so we'll give you the abbreviated Cliffs Notes version this evening.

Our consultants for the engineering report are from the company HDR Engineering. Their scope of work included:

- Analyzing soil and rock conditions to develop a subsurface profile of the embankments
- Studying the stability of the embankments
- Evaluating different scenarios that affect the hydrology (rainfall runoff) and hydraulics (water movement) in the Panbowl area;
- And providing recommendations for potential infrastructure improvements

For the subsurface conditions, investigation of the embankment subsurface consisted of taking boring samples from 12 locations along KY 15. The drilling went from ground surface level until reaching bedrock. Lab tests evaluated foundation soils to determine moisture content, dry density, hydraulic conductivity, shear strength, and other properties.

Examples of rock and soil types observed included: topsoil, rock fill, bedrock, shale/sandstone, and groundwater.

A factor of safety is an expression or measurement of the strength of a structure – in this case, the strength of the embankments – against different stress or load scenarios. The engineering consultants performed slope stability analyses of the three embankments to determine if the factors of safety for the existing cross sections meet acceptable standards for dams.

The strength of the embankments was evaluated under the scenarios of steady water seepage and varying water levels. When lake and river levels are normal, the factor of safety for the embankments was determined to be acceptable.

When either the river is high or the lake level is above normal and there is steady water seepage, the factor of safety for the embankments is considered too low.

Now for the H&H report. The March 2021 event resulted in flooding much larger than what would normally occur solely due to the rainfall and runoff that occurred. The hydrologic modeling created by the engineering consultant for this study estimates a lake elevation of only around 714-feet (about a foot above normal) would have occurred due to runoff from the storm; but what happened was an elevation of nearly 729 feet. We, KYTC, believe most of this water seeped through the west embankment from the high river.

The study found that under normal discharge conditions, Panbowl Lake does have sufficient capacity to pass a 6-hour Probable Maximum Precipitation (PMP) Design Storm without overtopping either of the three embankments. The peak flood elevation would be approximately 735.7 feet, while the east embankment overtopping elevation is about 739 feet.

Now for the recommendations.

The engineering report made several recommendations, two of which were completed last year. The debris gate has been replaced over the east embankment standpipe and crews have removed a significant amount of vegetation along the embankments.

Other possible improvements include installing a sheet pile wall at the west embankment, flattening slopes, adding a secondary gate on the Washington Avenue outlet channel, adding a new drawdown valve at the east embankment, and widening Kentucky 15.

Here is a before and after picture of the debris gate sitting over the standpipe at the east embankment. The new one was manufactured by District 10 personnel and installed last summer.

Now for the sheet pile wall.

The installation of a sheet pile cutoff wall helps increase the slope stability by reducing excess water pressure as water tries to move through the embankment fill. Sheet piling is basically a metal retaining wall that would be driven into the embankment and under the road.

There is funding in the proposed highway plan that is currently being considered by the General Assembly to install a sheet pile wall at the west embankment this summer. This would be a substantial improvement to the overall safety of the dam.

Future improvements will also include adding rip rap… heavy rock… to the embankments. This would be much stronger and more stable than grass or dirt.

Plans to widen Kentucky 15 are moving forward, but construction is not anticipated for another 2-3 years. In this rendering, Panbowl Lake is in the bottom of half of the picture.

Here's the proposed east embankment. The widening project will involve putting fill material into the lake to support the new KY 15 embankments and extending the culverts. Washington Avenue will also be widened. The hydrology and hydraulics report determined that this added material to Panbowl Lake would not cause a significant impact on the overall water capacity of the lake. This is a close-up rendering of the KY 15 east embankment.

At Washington Avenue, the current 60-year-old flap gate will be replaced, and a secondary gate will be added further upstream to add redundancy to the overall system. And here you can see a rendering of what the top view of Washington Avenue will be like whenever the project is completed.

And lastly, here's the proposed rendering for KY-15 along the west embankment. This concludes our presentation, and we'll open the meeting up to questions and I'll hand it over to Brenna.

Brenna Angel: Thanks, Aric. We are now in the Q & A portion of this public meeting. Please use the Q&A box at the bottom of your screen to type your question. You can also schedule to meet with the project team in-person at the District 10 office. Appointments are available beginning next Monday, January 31, through February 11. Send an email to KYTC.District10info@ky.gov or call 606-666-8841 if you have questions or would like to schedule something in-person.

While we're waiting to see if folks have a question, I will present this to Corbett or Aric**,** when can we expect to see the sheet pile wall at the west embankment?

Aric Skaggs: Well, currently we're in planning and development, including having to locate some utilities and trying to deal with those, but the hope is that, by late summer/early fall that we'll actually be working on installation. We're anticipating spring of 2023, we hope to have it completed.

Brenna Angel: Alright and that was one of the questions we got: How long will it take complete the improvements? So we've got that there for the sheet piling. Anything else you want to expound on for overall improvements?

Aric Skaggs: I'll just also comment that that's our goal. Of course whenever we get to construction season, and doing construction work, it's also weather dependent, so hopefully we'll have good weather whenever the time comes. It is a top priority of this office and central office that we try to work on this as quickly as possible.

Brenna Angel: Another question - will this project work in conjunction with the Highway 15 widening project? You said the Highway 15 project won't begin construction until for another two to three years so will both projects have to work together?

Aric Skaggs: Absolutely, we're going to make sure that the two of those projects work together and don't conflict. We're definitely considering both those.

Brenna Angel: Another question – Mr. Thorpe asked if we could provide some details for plans for the lake area closest to Jackson.

Mr. Thorpe, if you if you can type in something a little more specific, or we can certainly look at go back and look at the rendering. Let's see.

Aric Skaggs: Or, if he would prefer, we can talk privately or show something more individually.

Brenna Angel: Another question - are there any environmental permitting issues that still need to be addressed?

Aric Skaggs: Yes, on every project we always have environmental permitting issues to work with. Whenever you deal with federal money, there's lots of environmental paperwork and

hoops you have to jump through. We've already got a substantial amount of those already completed but there are a few more permitting issues that we have to resolve.

Brenna Angel: Another questions - is there a plan for a drawdown valve at the east embankment?

Aric Skaggs: Yes, I believe that we mentioned them in one of the slides.

Brenna Angel: That would be part of the overall widening for Kentucky 15.

Brenna Angel: And, as a follow up question to that, the images of the current flap gate show that it is nearly underwater. If the lake is drawn down, where would that water go since the water at the flap gate would be higher?

We should also point out, when these photos were taken, it was after some --a higher level. We took these images and the current drone footage that you all saw in the video and with this presentation the week of January 5, so it was after some significant rainfall on New Year's weekend. I don't know if there's anything more we can add to that Aric, that question?

Aric Skaggs: To a certain degree, water will seek its own elevation, so as long as there could be some positive flow, then it would eventually disperse.

Brenna Angel: And just a quick note for participants in the meeting. If you clicked the "raise your hand" button, please try to put those questions in the chat because we're not able to have people ask their questions out loud or call on folks individually.

Next question - when construction begins for the sheet pile wall, how much will traffic be affected going through the Panbowl area and specifically on Kentucky 15 and Kentucky 1812?

Aric Skaggs: Whenever you have construction activities there's always going to be some inconvenience for traffic, of course, and we try to minimize those as much as possible. But just to relieve everyone's worries, we will not completely shut down Kentucky 15. We will not get to a point where Kentucky 15 is shut down for days and you have to find an alternate route. So we will keep traffic flowing.

Brenna Angel: And, we have a question – was it studied to move the exit flow for drainage from the east embankment to the west embankment?

Aric Skaggs: Yes it was.

Corbett Caudill: Aric, let me answer that. We've looked at that a few times for other projects. That is sort of outside of the scope and we have looked at that several times in the past 20 years with other KY-15 widening discussions, but it's expensive. Generating the material and

the constructability, being able to construct that. We have looked at that. The cost and constructability I think make it prohibitive.

Brenna Angel: We have one comment that says, "I think the flap gate will really help. You can drive by and see water gushing into the lake when the river is high."

We have another question - at what level does the dam become unstable?

Aric Skaggs: If by unstable you mean unsafe, we believe that the dams are safe. If we didn't feel that they were safe, then we would have removed traffic from them. Corbett do you want to expound on that any?

Corbett Caudill: We've got several -- when we talk about our project team, it includes several different folks. Some of those folks are from the Energy Environment Cabinet, the Division of Water. They're part of the project team. And they do all the - the dam safety group - does all the inspections statewide on all dams. They were here in March. They were a big help assessing the issues, the things that were going on. I would say as we move forward they're going to be involved every step of the way. We'll continue to monitor until we get these improvements that we've talked about here today in place.

Brenna Angel: Next question – when construction is done, how much wider do you estimate both dams have to be to coincide with the factors of weight of the water and traffic impact weight?

Aric Skaggs: That would probably be a better follow up question just to sit down and show somebody a set of plans, because it's really very hard to explain something like that without a set of plans in front of us.

Brenna Angel: Another question - would there be any need for a geomembrane liner included on the sheet piling wall to prevent seepage on the interlocking spots of the wall, or is it believed that this seepage would be negligible?

Corbett Caudill: I think, to me, that's details. We've hit sort of high-level
talking about our design. A lot of these questions are getting into details that will be addressed. And yes, those joints will have something, I don't know exactly what you call it, but there'll be something added to those joints to make this wall that will be constructed waterproof. And there's other things that will happen along with that. That wall is the major part of what's going on, but there will be other things happening also.

Brenna Angel: The follow up question is about the flap gate – the flap gate is nearly underwater all the time due to downstream silt buildup behind the Breathitt bus garage down to the river. Is there a plan to dredge that area to allow proper outflow of water which might allow water to flow out during a timed drawdown?

Brenna Angel: I believe that was part of the recommendations in in the study of long-term, looking at having more of a structured, cleared-out outlet channel. Correct, Aric and Corbett?

Corbett Caudill: That is correct. And we will look at that, but that gets into right of way, utilities, and things that really gets involved and we have to get down in the weeds to see how that's going to work out.

Brenna Angel: And another question – how often is the stability of the dam checked until improvements are made, and when was the last time the dam was checked prior to the March flood?

Corbett Caudill: The Division of Water inspected that dam and in September 2021. They inspect it annually.

Brenna Angel: And there was a follow up question -- when the embankment started to slip, roughly how quickly did that slippage happen? Was it over the course of a few hours?

Corbett Caudill: When I arrived on scene it already occurred, so I don't have an answer to that. The slip was shallow. You know there was two or three foot of material. It was that thick. It was just that outer topsoil that had moved.

Brenna Angel: And then, Berry, I don't know if we can scroll back to the east embankment rendering. We've had a... I'm sorry… the west embankment rendering. We've had a question to talk a little bit more in detail about that, but I think it's important to note that this is the proposed rendering at this point, right Aric? If there are questions about the widening of Kentucky 15 it might be best to talk in more detail, either in person or email or phone.

Aric Skaggs: Absolutely. We don't, we don't care one bit to talk to people, we'd be more than happy to talk individually if they'd like to discuss more details on something.

Brenna Angel: You can see in this image, sort of an overlay of where the new proposed, the wider Kentucky 15 and the adjacent roads would be underneath that you can kind of see a faint outline of where the waterline exists today.

One question was: Would it be possible to elevate Panbowl Road where it exits? I think, again, that might be one where they're looking at that as part of the 15 widening project.

Okay, might it be necessary to check the stability more often until improvements are made?

Corbett Caudill: We mentioned earlier that we will be monitoring this. And we will. Anytime the river gets up, we're going to have people out there, looking for any kind of indication of movement. During the March 2021 flood event... And folks, during this study, it was determined that that was the second highest event since the lake's been built that we've ever

seen in this area. That embankment was stable. There was some seepage, we all witnessed that, but there was no indication of anything moving. We will continue to monitor until we get improvements in place.

Brenna Angel: Alright I think this will be a good probably final question. Sharon asks, can we be emailed a copy of this presentation and the hydrology study?

I know we will have this presentation recorded, the video of it transcribed and we're also going to have it available online through the District 10 webpage. I believe the studies are in draft form as they're being reviewed.

Aric Skaggs: We are we are reviewing those. They are in draft status so they're not quite ready, but we will have a handout, I believe, available for a little more information for people to have immediately. So we'll be producing that and having it available in the next day or two, hopefully.

Brenna Angel: Actually one more question. There's a question about Washington Avenue. Will the opening underneath the area in and around the Breathitt Technology Center and the high school be enlarged or changed to allow better flow and not as much stoppage?

Corbett Caudill: I guess, and Aric you correct me if I'm wrong. When you see water in that area, the river is what's controlling that. However how high the river gets, it just backs up that outlet channel and that's going to be your elevation that it gets to. The river controls that water. It is what's causing the flooding on Lakeside. That water that's infiltrating... What we've witnessed, we think mostly that west embankment, if it wasn't for that, that's what our hydrology study has proved, the lake's not gonna reach nowhere near the flood elevation that we've seen if the water from the river is not getting into the lake.

And it has for years. This is not something that started happening back in March. The water has infiltrated that embankment because the embankment's built from rock. It's done this since it was built to a certain degree. Short answer to that, and I went longer than I probably should have. What's controlling that water around the campus over there at Breathitt High is the river and how high it gets.

Brenna Angel: Brenna Angel: Yes. Okay. I keep saying one more question but they keep coming in.

Does anyone recall from the study as how much water goes into Panbowl from the new Highway 15 that was recently constructed?

I believe the H&H report did look at that as well to determine what effect, if any, the previous 15 work had.

Aric Skaggs: It did look at that. The recent 15 project that was done within the past 10 years, basically the amount of water, it actually decreased. We rerouted some of that water, to where it went to the river now instead of going to Panbowl. So it actually helped that situation.

Corbett Caudill: We actually put a new 84-inch pipe in through Shell Mart, everybody knows the Subway Shell Mart, I think it was an 84-inch pipe that was laid through that parking lot that's picking up some more of that water than what it had before.

Brenna Angel: There is a question about funding, overall funding. Federal funds were mentioned, is there a special grant for this or some other funding being utilized?

Aric Skaggs: Currently it's working its way through the legislature. Grants, there have not been any grant applications on this yet, but as of right now, the plan is to use a federal allotment of money that we're given. There's money dedicated to that. We're just waiting for the General Assembly to go through the Highway Plan, which the Highway Plan is reevaluated every two years. So it's currently in the legislature, so as soon as that gets approved and that bill gets passed, then the funding will be set up and we'll be ready to go with it.

Brenna Angel: We have a question – will the funding be in this year's legislative budget?

Brenna Angel: Yes, it is and that's what's being reviewed by the legislators in Frankfort right now. They will wrap up their session this spring in April.

Corbett Caudill: Our leadership has told us just to keep working on it. We've had no indication that there will be a budget constraint. They've told us to get things going.

Brenna Angel: Everyone, we appreciate you all attending tonight's meeting. We know that you may still have questions. We may not have been able to explain everything as fully as you wanted, and if that's if that's the case, then please reach out to District 10.

You all know that District 10 is right there in Jackson on Kentucky 15 in the Panbowl area. So this is a priority project for the district, one that they are very familiar with, so please reach out using the contact information you see and stay in touch. We appreciate your time and hope you have a good evening.