

FLOOD REVIEW BOARD

Date: April 28, 2022

Time: 8:30 AM, MDT

Location: Lake Estes Conference Room, 3rd Floor, 200 W Oak St., Fort Collins, and Zoom meeting

Contact: Tina Kurtz, Larimer County Engineering Department

MEETING MINUTES

Staff Present: Tina Kurtz, Caryn Nezat, Traci Shambo, Devin Traff, Amy White, Hannah Suppes

Board Members Present: Bets Ervin-Blankenheim, Chris Carlson, John Hunt, Greg Koch, Chad Morris, Dr. Chris Thornton

Call to Order: Mr. Koch opened the meeting at 8:45 a.m., MDT

Introductions

Item #1:

Public Service Company of Colorado - New gas pipeline under the Big Thompson River at I-25 – Floodplain Project Review

Applicants Present: Chris Olson, Wright Water Engineers; Lisa McDaniel, Xcel Energy

Ms. Kurtz introduced the project to the Flood Review Board (FRB) and stated that this is a request for a Floodplain Project Review for a new 6" gas line under the Big Thompson River in the regulatory floodplain. The project is located east of the I-25 Frontage Rd from south of Lacy Lane to Ronald Reagan Dr. The gas line will be horizontally bored and approximately 20' into bedrock under the river. There will not be any land disturbance within the floodplain in Larimer County.

Mr. Olson, the applicant's engineer, gave his presentation on the project and shared the presentation for the record. He added details related to horizontal boring locations and stated that there will be no bore pits within the Larimer County floodplain. There will be a few bore holes in the Town of Johnstown and the City of Loveland and Mr. Olson stated they will apply for Floodplain Permits with both jurisdictions. He noted that although there is no ground disturbance within the Larimer County Floodplain, a Floodplain Development Permit is still required due to the gas line crossing under the Big Thompson River within the floodplain. He shared the proposed profile of the line that showed it will be approx. 20' below the invert of the Big Thompson River and will be at approx. 4,810' in elevation. They also obtained geotechnical reports that were prepared for CDOT for the CDOT project that is just west of proposed crossing. The geotechnical reports showed bedrock between elevations 4,835'- 4,840'. In



summary, he stated that the proposed gas line will be about 20 feet into bedrock, which they find will be sufficiently adequate to protect the line from the scour potential in this location.

The Flood Review Board (FRB) began discussions of the project.

Mr. Hunt asked about the coordination with CDOT on their current project to replace the bridges and asked if the gas line will be well way from any bridge infrastructure. The Applicant Team answered that that they did need to work around the downstream wingwalls, but the line is still 20'-30' below ground level in the vicinity of the bridge and confirmed that there will not be any conflict due to the depth of the line.

Mr. Hunt asked the applicant again to confirm that there is no work that will be at, or above, grade in the regulatory floodplain. Mr. Olson confirmed.

Motion:

Mr. Hunt motioned to recommend approval of the Floodplain Project Review to the County Engineer. Dr. Thornton seconded the motion.

Further Discussion:

No further discussion.

Vote:

Mr. Koch – yes

Mr. Hunt - yes

Dr. Thornton - yes

Mr. Morris - yes

Ms. Ervin-Blankenheim - yes

Mr. Oberlander - absent

Mr. Carlson - yes

Motion passed 6-0.

Item #2:

City of Fort Collins – new 36" raw water line under the Cache la Poudre River near Gateway Natural Area - Floodplain Project Review

Applicants Present: Amy Johnson, City of Fort Collins; Kayla Ranney, HDR; Sara Race, HDR

[Call to Order: Mr. Koch re-started the meeting at 9:05 a.m., MDT]

Ms. Kurtz introduced the project to the Flood Review Board (FRB) and stated that this is a request for a Floodplain Project Review for the City of Fort Collins to replace an exposed 27" section of a raw water line under the Poudre River with a new 36" line. The new water line will be in a more perpendicular



alignment than the skewed alignment of the line to be replaced and will have approximately 5.3 feet of cover and be encased in concrete. The project will match existing grade to maintain a no-rise condition.

The applicant presentation team included Amy Johnson, City of Fort Collins; Sara Race, HDR and Kayla Ranney, HDR. Ms. Johnson described that this project will replace the existing 27" raw water line with a 36" diameter ductile iron pipe. The work is within the FEMA Zone A Floodplain and is downstream from the Gateway Natural Area and that half of the project will be on City-owned property and other half is on a private property. They have coordinated with the landowner for the needed temporary construction and permanent easements. She explained that the City needs to replace the raw water line in the immediate future since the existing 27" steel waterline is currently exposed and the replacement and protection effort is needed to ensure operational longevity. She noted that the larger pipe was planned to allow for the option of combining two of their raw waterlines into one if need be in the future.

Ms. Race showed the alignment of the 36" diameter pipe and stated that the key design elements were moving pipe 25' from left bank, creating a more perpendicular crossing to minimize length of pipe, locating the pipe in more of a pool section of the channel instead of the riffle area, and to lower the pipe to have 5' of cover, with concrete encasement, in order to address scour. She stated that the plan is to achieve a no-rise condition by maintaining the pre-construction grades. They will perform a pre- & post-project survey to ensure a no-rise condition and no adverse impact from the project and will provide the County with both certifications at the end of project. The plan for construction is to have a temporary access road to get to the left bank and divert half of the river to using a coffer dam and a diversion dam. They will then flip the process to perform the work on the right side of the channel, closer to Hwy 14. Their position is that the work will have minimal environmental impacts since they plan to reseed the disturbed area and do willow live staking after construction. They will come back in the spring to make sure the seed and willows are established to minimize the potential for erosion.

Ms. Ranney, presented the scour analysis. They used the hydrologic data from the Anderson Consulting Study that showed 14,200 cfs is the 100-year peak discharge at this location. They performed a simple 1D HEC-RAS model from 300' upstream to 100' downstream of the project location. The topographical data was taken from specific site survey and from publicly available LiDAR. The method used was the US Bureau of Reclamation regime scour equations that resulted in an average 4.5' scour depth potential so they are planning for a 5' depth to account for any uncertainty in the modeling. She noted that they have an additional 0.3' from scour depth to the design top of pipe.

The applicant team reminded the group that this line needs to be repaired since it is critical infrastructure to the City. They looked at multiple design options and found that this design is the best solution to repair the existing line for minimal environmental impacts and a no-rise result. This is also to adequately plan for the future.

The FRB began discussions.

Mr. Hunt asked about the slide that showed the construction features. He noted that there was minimal disturbance to the right bank where the line runs parallel to the right bank and asked how deep the line



is below the toe of the bank at its shallowest location. The applicant team answered that 5' of cover exists along the line everywhere.

Dr. Thornton noted that the exposed part of line appears to be from channel shifting and scour. He questioned that if the channel moves at all, will the end points be at risk. The answer from HDR staff is that they looked at this scenario and talked about encasing the pipe with concrete at these locations but their final analysis was that the extra protection is not necessary because for this risk of erosion to occur, the channel would need to move 25' laterally. In addition, they noted that they have construction constraints as well. A photo of the current channel banks condition was shown, and it appeared that the left bank is stripped from recent erosion exposing the pipe.

Mr. Hunt asked if the work would include a stabilization effort at this location and if the applicant team knew how far the channel shifted to expose the line. HDR staff noted that the stabilization work included reseeding and willow planting for low to high flow levels and Ms. Johnson said they did not know exactly when the line was exposed and how far the channel may have shifted in recent years. Both Mr. Hunt and Mr. Koch expressed concern over the potential for the channel to move laterally and asked what the expected velocities are at this reach. Ms. Ranney found that the velocity is 13 feet per second (fps) and there is a $D_{50} = 55\text{mm}$ from the pebble count found in the Stantec report, which they used the data from to support their analysis.

Mr. Koch said that they were planning a 10' deep open cut construction, but considering the native material, they may need a 25' wide cut. However, this is a concern because it is difficult to adequately stabilize a cut in the river environment and that seed and willow may not be enough, so he recommended that they consider buried riprap. The applicant team said they will be using trench boxes to minimize disturbances and cuts.

Mr. Carlson spoke of his experiences with the City of Loveland pipelines that were exposed during the 2013 food of the Big Thompson. His opinion was that the location of the City lines was in a safer location as far as river dynamics go but the Big Thompson channel bank moved more than anyone guessed it would. Considering his experience, he recommended that they extend the concrete encasement. He also asked if they are planning joint restraints or anything else to anchor the pipe. The applicant team said they were anchoring 30' beyond the joints.

Mr. Morris asked about backfill and agreed with Mr. Carlson for the need for riprap on bank cuts. HDR staff stated that they will use CDOT Class 7 & 8 and backfill will include native and structural backfill, plus the trench will have stabilization with rock wrapped in geotextile fabric, per the project specifications.

Mr. Hunt confirmed that the FRB is concerned with the proximity of the line to the bank and that they believe the channel could likely move 25' laterally given the high risk zone and velocities at this location. He asked if the design team could make any changes to the design to get more space from the bank. The design team said that they are already at toe of natural topography slope and that are very constrained trying to stay clear of the existing 24" pipe.



Mr. Carlson noted that at Station 2+00 to 2+50 it appears that, if the river moves 12'-25', the pipe will be quickly exposed and suggested changes to help maintain cover in the event the channel does move. He reminded everyone the Big Thompson moved over 100'. Ms. Johnson noted the concern and said that their lead engineer is not at the meeting and so she was not able to say if they can consider the changes discussed and if the suggestions are even feasible, but she stated she would take the suggestions to the lead engineer for further evaluations.

Mr. Hunt pointed out that City is the owner and stakeholder and asked the FRB to consider in their discussion where the FRB purview ends with safety of the line versus the floodplain, river and downstream impacts from the construction or potential debris if the line is exposed and fails.

Dr. Thornton agreed and said that more should be stated in the report about the risk of channel movement.

Mr. Morris also expressed concern that applying the regime equations alone without other data may not accurately reflect existing potential for channel migration and scour.

Mr. Koch agreed and asked if there are other historical photos to show shifting that has occurred in order to better document the risk and understand potential for lateral and vertical movement. Mr. Koch also asked them to consider lowering a piece of the pipe on the left bank given the concerns discussed but he was not as worried about the right bank. He also recommended that the applicant does more erosion protection on toes of the slopes, such as using stabilizing riprap.

Mr. Hunt referred to the presence of bedrock. The applicant team said they did test pits and did not encounter bedrock and the test pits went approx. 7.5' deep. They considered boring the line but considering the geotech analysis and other constraints, open cut was the best option. All agreed.

Mr. Hunt said to the FRB that it seemed that they were either looking to approve the project with conditions or table the project and asked what the conditions might be if they decide to table it. Concerns and additional information request have been: documentation of the historical movement of the channel; evaluation of hydraulics to verify if riprap is needed at the toe; and additional documentation and calculations on how the decisions were made to use the proposed materials given the velocities. Mr. Hunt suggested the applicant team look at the feasibility of lowering the profile for short distances at left bank and they clearly state how many feet of movement they have until they no longer have the 5' of cover.

Ms. Ervin-Blankenheim asked about averaging the scour depth data instead of using the more conservative value. Dr. Thornton said it is the standard practice to average and he is not as worried about the channel moving vertically but finds that it is likely that it will move laterally, so he again emphasized the value in finding any historical data that would help evaluate these concerns.

Ms. Johnson restated that she is concerned about their ability to redesign due to the constructability issues with to going deeper such as trench depths, additional material to haul off, etc. and so she would need to talk to their contractor about options.



Mr. Hunt pointed out again that an engineered stability treatment is likely what will be needed for stability. Ms. Johnson followed up by saying that they will consider buried riprap and it would be an acceptable addition to their design that will still accomplish their goals.

Mr. Koch referred to similar project he worked on where they had to go back with a more engineered protection after the bio-protection design failed the first two attempts and that this area will also likely not hold up with only natural protections such as seed and willows given expected velocities. Mr. Carlson also suggested buried rock spurs that City of Loveland found beneficial in the City of Loveland line repairs.

The FRB decided that their purview is that they ensure the project will leave the area with a stable condition to prevent scour and that they need more information to verify and document their decisions. The FRB found that they should take a look at the project again based on the types of information they are requesting.

Motion:

Mr. Hunt moved to table the application for up to 90 days to ask the applicant to further examine the design in terms of the lateral and vertical stability of the channel and to include more detail on the risk of exposing the new line if the channel moves. Quantification of the erosion methods in the report are also required. Mr. Morris seconded the motion.

Further Discussion:

No further discussion.

Vote:

Mr. Koch - yes
Mr. Hunt - yes
Dr. Thornton - yes
Mr. Morris - yes
Ms. Ervin-Blankenheim - yes
Mr. Oberlander - absent
Mr. Carlson - yes

Motion passed [6-0].

Item #3: Approval of January 27, 2022, Board meeting minutes

Dr. Thornton moved to approve the January 27, 2022, Board meeting minutes. Ms. Ervin-Blankenheim seconded.

Further Discussion:

No further discussion.



Vote:

Mr. Koch - yes

Mr. Hunt - yes

Dr. Thornton - yes

Mr. Morris - yes

Ms. Ervin-Blankenheim - yes

Mr. Oberlander - absent

Mr. Carlson - yes

Motion passed 6-0.

Other items

- Discussed upcoming agendas.

Meeting adjourned at 10:15 a.m., MDT.