FEDERAL ENERGY REGULATORY COMMISSION
Office of Energy Projects
Division of Dam Safety and Inspections - Chicago Regional Office
230 South Dearborn Street, Suite 3130
Chicago, Illinois 60604
(312) 596-4430 Office

In reply refer to: P-2056

November 21, 2024

VIA Electronic Mail

Mr. Scott Crotty
Senior Operations Manager
Xcel Energy
Scott.a.Crotty@xcelenergy.com

Re: St. Anthony Falls Hydroelectric Project (FERC No. 2056)
July 2024 Drilling Program Plan Approval

Dear Mr. Crotty:

Xcel Energy's (Xcel) July 29, 2024 letter filed a Drilling Program Plan (DPP), for a geotechnical subsurface investigation at the St. Anthony Falls Hydroelectric Project No. 2056. The DPP, which included a Quality Control and Inspection Plan (QCIP) for the drilling investigation work, was prepared by your consultant, Barr Engineering Co. (Barr).

The submittal proposes abandonment of two existing screened standpipe piezometers and installation of two replacement screened piezometers in the Hennepin Island Earth Dam. The scope of work indicates that the two piezometers (PZ-1-18 & PZ-2-18) will be removed from the hole by over-drilling and abandoned with tremie-placed neat cement grout. The boring for the two new piezometers (PZ-1R-24 & PZ-2R-24) will be completed using sonic drilling method. The purpose of the proposed work is to provide a soil/fill conditions just downstream of the proposed cutoff wall, replace existing piezometers that are along the proposed seepage cutoff wall, and provide long-term pore water pressure reading to confirm effectiveness of the cutoff wall.

We reviewed the information provided and our comments are in the Enclosure of this letter. Your response or plan and schedule to address the comments in the Enclosure should be submitted by **January 30, 2025**. You may not proceed with the execution of the DPP until you receive authorization from this office.

Also, the abandonment of the two piezometers should be captured in the Dam Safety Surveillance and Monitoring Plan.

You may contact Mr. Paul Kokoszka at 312.596.4457 (Paul.Kokoszka@ferc.gov) or me at (312) 596-4430 or if you have questions.

Sincerely,

KEVIN GRIEBENOW

Digitally signed by KEVIN GRIEBENOW
Date: 2024.11.21 13:16:04 -06'00'

Kevin Griebenow, P.E.
Regional Engineer

Enclosure – FERC Review Comments on the July 2024 DPP

cc: Mr. Dean Steines, PE. Chief Dam Safety Engineer at Xcel Energy
dean.s.steines@xcelenergy.com

Enclosure – FERC Review Comments on the July 2024 DPP

1. Section 2.2.2 – Per our drilling guidelines, provide scaled cross sections of the dam showing existing embankment features, estimated phreatic level given the current embankment conditions, estimated foundation contact given the available record drawings, location of seepage areas, and the proposed location and depth of borings and piezometer screens. Also, revise Figure 2 to show the distance of the proposed borings/piezometers from the concrete and limestone masonry training wall.

2. The Technical Specifications for Standpipe Abandonment do not specify what drilling method will be used for over-drilling the two standpipe piezometers. Revise the Technical Specifications to clarify this item.

   Alternatively, if these piezometers are located along the alignment of the planned seepage cutoff wall, consider fully tremie grouting the inside of the PVC pipes or deferring the piezometer abandonment, since drilling for the secant pile wall would drill through the piezometer pipes in any case.

3. Borehole completion of the DPP states that a tremie-placed neat cement grout shall be used to backfill the borings. If the actual grout takes exceeds 150% of the theoretical grout volume of any stage, halt the grouting operation and contact us to discuss possible corrective actions. The field professional supervising the drilling work should monitor grout take after the placement of every batch of grout to ensure grout loss control measures are timely implemented. It is not acceptable for field staff to identify grout takes in excess of 1.5 times the theoretical volume only after the borehole has been completely backfilled.

4. Provide placement methods for the bentonite pellets and sand around the piezometer pipe to ensure borings are fully backfilled from bottom to top. Placement of bentonite pellets and granular material typically require placing these materials in lifts and periodic tapping and sounding of the backfill depth to ensure no voids/cavities are left. Also, the professional supervising the drilling work, should periodically compare the theoretical and actual volume of materials to ensure corrective measures are implemented in a timely manner.

5. The monitoring plan in the DPP should require the daily reading of the nearby piezometers (PZ-3-18 and PZ-4-18).

6. Section 2.6 – a. Per our drilling guidelines, a discussion should be provided as to what (i) materials and (ii) methods will be used to prevent damage to the dam should problems such as loss of drilling fluids or seepage adverse conditions be encountered during drilling and boring backfilling work. Also,

we note that the DPP is limited to address artesian pressures by backfilling the boring with grout but does not discuss material/methods that must be available at the site to control hydraulic pressures to allow the proper placement of grout.

7. Revise technical specifications for tremie-placement of grout to clarify that the tip of the casing should be maintained below the top of the grout backfill level at all times (for example see Technical Specifications, Section C-4, Paragraph 4.5.3).

8. Include the following information in the emergency contact list/personnel notification flow chart. Any aberrant conditions encountered should be reported to our office as soon as practical after the situation is discovered, without interfering with any necessary emergency response.

Kevin Griebenow	kevin.griebenow@ferc.gov	312-596-4436
Marilyn Sabido	marilyn.sabido@ferc.gov	312-596-4456
Paul Kokoszka	paul.kokoszka@ferc.gov	312-596-4457

9. The resume of Ms. Erica Hill, proposed as field professional supervising the drilling work, does not indicate that she meets the minimum qualifications required in our drilling guidelines. A minimum of 4 years of embankment dam drilling experience is required for professionals supervising drilling work in high hazard potential dams. Alternate field professional that meets this minimum qualification must be proposed.

10. The Qualified Driller Biographies did not provide sufficient information to show they have embankment drilling experience in accordance with our drilling guidelines. Resumes for each of the proposed lead drillers indicating a minimum of 5 years of experience drilling with the equipment and procedures described in the DPP, and clearly demonstrating embankment dam drilling experience must be provided.