526 South Church Street
Charlotte NC 28202

Mailing Address:
Mail Code EC11J / P.O. Box 1006
Charlotte, NC 28201-1006

February 24, 2014

Mr. Steve McEvoy, PE
State Dam Safety Engineer
NC Dept. of Environment and Natural Resources
Division of Energy, Mineral and Land Resources
Land Quality Section
1612 Mail Service Center
Raleigh, NC 27699-1612

Subject: Dan River Steam Station - Primary Ash Pond Dam
Stormwater Conduits Beneath the Ash Pond Reservoir
State Dam ID: ROCKI-237
Eden, Rockingham County, North Carolina

Dear Mr. McEvoy:

This letter is in response to your letter dated February 14, 2014 concerning the stormwater conduits beneath the primary ash pond reservoir at the Dan River Station. In your letter, you expressed concern about the existing 36" diameter stormwater pipe (RCP) located beneath the primary ash pond, and listed specific areas of concerns after viewing the pipe inspection videos provided by Duke. As requested, this letter provides a plan as well as schedule for the design and implementation of mitigation measures to resolve the issues and concerns with the 36" diameter pipe.

Description of Plan and Schedule

The existing 36" Stormwater Reinforced Concrete Pipe (RCP) running along the eastern edge (inside pond) of the primary ash pond at the Dan River Steam Station is to be permanently abandoned. This will be accomplished by filling the pipe with grout. More specifically, the line will be filled from the outlet to the existing drop box, which is underground on the outside of the northern dam near the inlet. The section of the pipe from its inlet to the discharge into the underground drop box will be plugged at the pipe inlet to preserve this line for potential future use after the ash pond is closed and removed from service. The line is approximately 1,080' (Orthographic Dimension) between the inlet and outlet.

The grouting operation will be completed in five Phases. They are as follows:

1. Reroute Stormwater from the inlet of the 36" pipe.
2. Install a temporary coffer dam just before the inlet to the 36" pipe.

3. Install a permanent grout plug on the outlet of the 36" pipe.
4. Grout the section of pipe from the drop box on the inlet side of the pipe to the outlet grout plug.
5. Install a removable plug on the inlet of the 36" pipe.

Phase 1 - Reroute Stormwater from the 36" Inlet - COMPLETE

- The Phase 1 operation must be in place prior to beginning work to grout the pipe.
- A collection system has been established for pumping Stormwater runoff that collects in the inlet side basin.

Phase 2 - Install a temporary coffer dam on the 36" Inlet - COMPLETE

- The purpose of the Phase 2 cofferdam is to provide assurance that runoff water is kept from entering the inlet of the 36" line. A small sump pump will be maintained inside the inlet area for the purpose of keeping water from entering the inlet. This sump water can be pumped back into the Stormwater basin (other side of the coffer dam). This dam should be constructed such that it can be removed later as this inlet portion of the 36" line can be reused after the Ash Pond is removed for routing water under the RR track bank.

Phase 3 - Install a permanent grout plug on the outlet of the 36" pipe - COMPLETE

- The 36" Stormwater line outlet has been plugged with a wood form system installed inside the pipe.
- The formwork incorporates a 6" diameter drain in the invert of the pipe to allow water to drain through the plug during the plugging process, curing and the period leading to the pipe grouting operation. This drain will be used as a grout port for the line grouting operation described in Phase 4. The formwork system also incorporates a high-end vent port to allow complete filling of the pipe with grout.
- The innermost form has been installed approximately 60' inside the Stormwater pipe. The outermost form has been installed approximately 20' inside the line. The plug length is designed to be from 40' to 50' long (plug length, not including form thickness).
- The 36" pipe has been cleaned of sediment and debris throughout the plug length.
- An estimated 10.5 cubic yards of grout has been used to fill the plug area.

Phase 4 - Grout the 36" line between the Dropbox on the Inlet side to the Outlet Grout Plug – SCHEDULED FOR COMPLETION BY MARCH 7, 2014

- Before this phase can start, the grout installed during Phase 3 shall cure for a minimum of 7-days or we achieve a compressive strength test demonstrating the grout has reached a minimum strength of 4,000 psi, whichever is sooner.
- Just prior to the grouting operation, a robotic camera shall be positioned at the top of the drop box from the inlet side to monitor the flow of grout into the lower portion of the drop box.
- The Phase 4 operation has to completely fill the portion of the pipe that is under the dam while keeping the pressure on the Phase 3 plug to less than or equal to 20 psi.

- The grout mix design must be approved by Duke Energy prior to commencement of the installation. It is important for this mix to be able to be pumped to the drop box end of the line from the outlet plug grouting port.
- The grout will be pumped from the river end through the grout access port cast into the Phase 3 plug. It will be pumped to the drop box near the inlet to approximately 2' above the top of the lower line. An estimated 234 cubic yards of grout will be required to fill the 36" line. The volume of grout placed will be recorded and compared to the theoretical volume of grout required to fill the plug to confirm that the area is full.
- A camera will be placed at the inlet side to the top of the drop box to monitor grout entering from the downstream end.

Phase 5 - Install a removable plug on the inlet of the 36" – SCHEDULED FOR COMPLETION BY MARCH 12, 2014

- At the completion of this grouting operation, the camera will be removed and the inlet plugged from the outside with a means that would allow the line to be reused at a later time. Once the Ash Pond is closed and removed, this line will be re-established for routing Stormwater from the inlet basin under the existing RR track bank. The portion of the pipe under the RR track, prior to the drop box is 48" diameter.

As you can see from the schedule above, many items are complete, and we plan to have it all complete by March 12, 2014. Please call me if you have any questions or need any further clarification at 704-382-4913 (office) or 704-458-0360 (mobile). Thank you.

Sincerely,

B. Henry Taylor, P.E.

B. Henry Taylor, PE

cc (via e-mail): Tim Russell
R. Scott Harris