



North Carolina Department of Environment and Natural Resources
Division of Land Resources

James D. Simons, PG, PE
Director and State Geologist

Beverly Eaves Perdue, Governor
Dee Freeman, Secretary

Conditional Approval to Impound

July 15, 2009

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Randy Beeman
Town Manager
Town of Hope Mills
5770 Rockfish Road
Hope Mills, North Carolina 28348

RE: Conditional Approval of Impoundment
Hope Mills Dam
CUMBE-029
Cumberland County

Dear Mr. Beeman:

This concerns the subject dam recently repaired pursuant to issuance of an Approval to Repair on June 2, 2006 as required by the Dam Safety Law of 1967. Record Drawings and the engineer's certification, were received on May 11, 2009. The drawings and certification were prepared and sealed by Mr. Everette Knight, PE, current engineer of record.

An inspection of this dam was made by Land Quality Section staff of the Raleigh Central Office and the Fayetteville Regional Office on April 17, 2009. The dam was found to be in general conformance with the approved plans and specifications subsequent to completion of warranty repairs by the Owner's contractor. Conditional approval to impound is hereby granted until June 30, 2013. This conditional approval to impound will be subject the following stipulations:

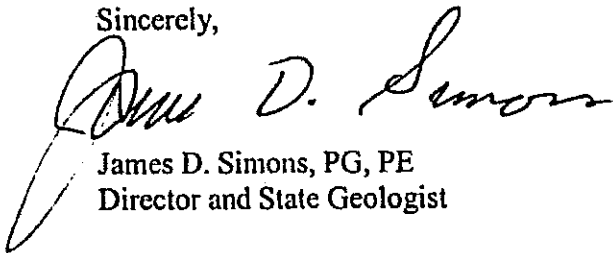
1. The monitoring program scope of work as described in the attached document dated July 10, 2009 will be implemented under supervision of Mr. Everette Knight, PE.
2. A report in accordance with the scope of work described in the monitoring plan will be submitted by Mr. Everette Knight, PE, on the last day of the following months:
 - a. September, 2009
 - b. December, 2009
 - c. March, 2010

Geological Survey • Land Quality • Geodetic Survey
Division of Land Resources • 1612 Mail Service Center, Raleigh, North Carolina 27699-1612
512 North Salisbury Street, Raleigh, North Carolina 27604
Telephone 919-733-3833 / FAX: 919-715-8801 • Internet: <http://www.dlr.enr.state.nc.us/index.html>

- d. June, 2010
 - e. October, 2010
 - f. February, 2011
 - g. June, 2011
 - h. December 2011
 - i. June, 2012
 - j. December, 2012
 - k. June, 2013
3. Upon submittal of the last report of the monitoring program on June 30, 2013 and a certification statement by Mr. Everette Knight, PE, that the dam is safe for continuing operation, issuance of Final Approval to Impound will be considered provided the Land Quality Section staff concurs that the dam is safe for continuing operation.
4. The Emergency Action Plan (EAP) and Operation and Maintenance Manual (O&M Manual) submitted on February 27, 2006 must be updated and submitted to this office by August 31, 2009. Subsequent to this, the EAP must be updated annually by August 31 of each year within the term of this Conditional Approval to Impound.

In addition, the Land Quality Section staff will make periodic inspections of this dam to assure that the dam is being maintained in good operating condition. If at any time during the term of this conditional approval to impound, conditions are discovered or determined by Land Quality Section staff that may constitute a threat life and property downstream, this approval will be revoked and the reservoir ordered drained.

Sincerely,



James D. Simons, PG, PE
Director and State Geologist

JDS/smm

Attachment

cc: Mr. Steve Cook, Land Quality Regional Engineer
Mr. Everette Knight, PE, Hazen and Sawyer
Surface Water Protection Supervisor

File name: CUMBE-029_20090715_COFACond_Hope Mills Dam

July 10, 2009

Mr. Steven M. McEvoy, PE
State Dam Safety Engineer
North Carolina Department of Environment and Natural Resources
Division of Land Resources-Land Quality Section
512 North Salisbury Street
Raleigh, NC 27604

Reference: Town of Hope Mills Dam
CUMBE-29 Cumberland County
Monitoring Program-Revised

Dear Mr. McEvoy:

This letter is in response to the correspondence to the Town of Hope Mills dated May 29, 2009 granting approval for temporary impoundment of the Hope Mills Dam provided a performance monitoring program is implemented as stipulated in the referenced document. The following provides an overview of our approach to the performance monitoring program as well as a summary of the 4 major elements of the periodic monitoring program that will be performed under the direction of the Engineer of Record on behalf of the Town of Hope Mills.

Please note that we have revised our approach to address the items noted in the email dated July 7, 2009. Exhibit A also presents the survey monitoring points as requested.

Overview

It is observed that of initial concern is the relative long term performance and safety of the dam and in particular the significance of the perceived vibrations that were observed during the later stages of construction during the Fall of 2008. We understand that initial discussions regarding this matter persuaded monitoring objectives to measure

HAZEN AND SAWYER

vibrations in the structure continuously with the ultimate goal of associating overtopping flows, vibration, and structure performance.

We have concern that such monitoring results could prove to be inconclusive. In particular it can be difficult to associate vibration monitoring results to structural behavior. And the structural behavior is most likely going to be based upon observed and measured results either after a major storm event or quarterly as described below.

As such, we have developed an approach where we propose to measure flows continuously and then inspect the structure after a significant spillway overflow (major event) to determine if there are structural or facility safety concerns related to the measured event. The flow measuring device would be connected to a continuous data recorder and auto dialer for notification. This inspection would include all elements of the inspection program and reporting as described below with each visit.

We further propose that if the observed behavior of the structure and associated facilities under the initial major event conditions is satisfactory, that the major event be redefined to a higher overtopping level that Dam Safety, the Engineer of Record, and the Town of Hope Mills agree to. Similarly if there are structural concerns after a major event or quarterly report, then we would adjust the proposed monitoring program accordingly as well to the satisfaction of Dam Safety, Town of Hope Mills and Engineer of Record.

Elements of Inspection Program

1. Inspection of the earthen embankment portion of the dam. This includes reading the plezometers and interpreting the data.
2. Inspection of the concrete structures including walls, floors, and topping slabs. This includes reading pressure gages in bottom slab and interpreting the data.
3. Measure horizontal and vertical locations of the concrete spillway structure. Horizontal and vertical movement will be measured at locations presented on the attached Exhibit A.
4. Continuously measure the flows over the spillway walls utilizing flow metering that communicates to a recording device. The recording device will be connected to an auto dialer and telephone service such that the Town of Hope Mills and Engineer of Record will have continuous access to the flow measurements.

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Frequency of Inspection

1. The routine inspection is anticipated to be accomplished in accordance to the State Dam Safety letter (dated May 29, 2009) beginning in September of 2009 and continuing through June 2013. In summary, periodic inspection will be performed on the following dates:
 - A. September 2009
 - B. December 2009
 - C. March 2010
 - D. June 2010
 - E. October 2010
 - F. February 2011
 - G. June 2011
 - H. December 2011
 - I. June 2012
 - J. December 2012
 - K. June 2013
2. In addition to the above, a major storm inspection will be performed when there is significant overtopping of the spillway. A major storm is defined initially as flows that exceed 3 inches of depth over the major spillway. (If after inspection of two of these events no structural changes are observed it would be proposed to redefine the major storm event to a higher level that the Owner, Engineer of Record and Dam Safety agree too.)
3. Similar to Item 2 above, if structural concerns are determined during the inspection visits then the frequency of the inspection visits is anticipated to be increased and/or measures implemented to maintain the anticipated safety of the facility.

Reporting

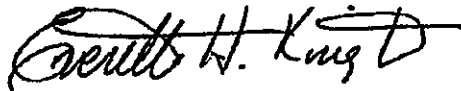
1. A report of findings will be provided by the last day of each month as noted above and stipulated in the referenced letter and/or after each major event. The report will address each of the elements noted above, as a minimum, any additional findings, and provide recommendations for corrective measures as necessary. Upon satisfactory completion of the June 2013 inspection, a statement will be provided in the final report that the dam is safe to operate in the absence of a monitoring program. All reports will be signed and sealed by the Engineer of Record.

HAZEN AND SAWYER

We appreciate your consideration of this plan. If you have any questions, please do not hesitate to call.

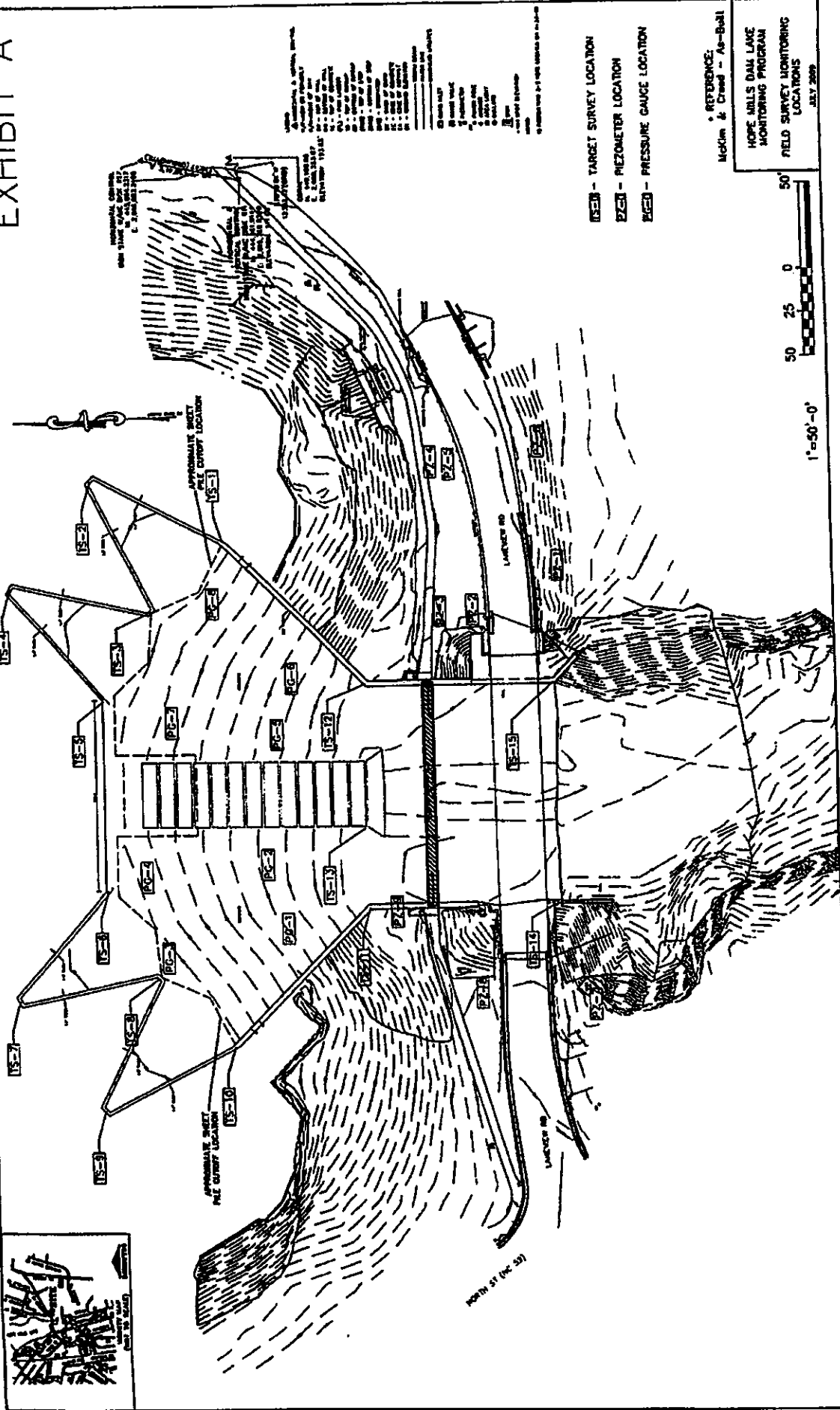
Respectfully,

Hazen & Sawyer

A handwritten signature in black ink, appearing to read "Everette H. Knight". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Everette H. Knight, P.E.
Senior Associate

EXHIBIT A



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- T5-1 - TARGET SURVEY LOCATION
- P2-1 - PIEZOMETER LOCATION
- P2-2 - PRESSURE GAUGE LOCATION

REFERENCE:
McKim & Creed - As-Built
HOPE MILLS DAM LAKE
MONITORING PROGRAM
FIELD SURVEY MONITORING
LOCATIONS
JULY 2009

