North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald van der Vaart
Secretary

Certificate of Approval

May 15, 2015

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Woodlake CC Corp.
c/o National Corporate Research, Ltd.
212 South Tryon Street; Suite 1000
Charlotte, North Carolina 28281

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Woodlake CC Corp.
401 South Tryon Street; Suite 3000
Charlotte, North Carolina 28202

RE: Approval to Repair – Phase 1
Woodlake Dam
Moore County
State Dam ID: MOORE-040

Dear Sir or Madam:

This is in response to your submission dated December 4, 2014 and January 28, 2015, received on December 8, 2014, and February 2, 2015, of plans, specifications, design data, and construction schedule for repair of the subject dam in compliance with the Dam Safety Law of 1967. This dam is of high hazard classification. The plans, specifications, and design data submitted were prepared under the supervision of Dr. B. Dan Marks, PE, of Marks Enterprises of NC, PLLC.

This letter constitutes approval of the proposal to repair the subject dam according to the plans and specifications received by this Division on February 2, 2015, with the following stipulations:

1. A minimum flow equal to inflow or 16 cubic feet per second whichever is less must be released from the dam site at all times, even during construction. Monitoring equipment in accordance with 15A NCAC 2K .0504 must be approved by this Division and installed.

2. Project construction shall be supervised by Dr. B. Dan Marks, PE. Dr. B. Dan Marks, PE, shall be responsible for field observation of construction as necessary to ensure compliance with approved plans.

3. During construction, the Division of Energy, Mineral, and Land Resources may require such progress reports as are deemed necessary.

4. In accordance with GS 143-215.29 and NCAC 15A-2K .0203, .0212, .0215, and .0216, within 30 days of completion of the project, Dr. B. Dan Marks, PE, shall inspect the completed work and upon finding that the work has been done as specified, that minimum stream flow requirements have been satisfied, and the dam is safe, shall file with the Division of Energy, Mineral, and Land Resources two sets of record drawings and a certificate stating that the work has been completed in accordance with approved plans, specifications, and other requirements.

5. The water level within the impoundment shall be maintained at a maximum plan elevation of 214.0 feet for the duration of Phase 1 repair activities. This elevation was specified by the engineer on Plan Sheet 15 of 18, Section 100.3 - Sequence of Construction, Note 1.

   In accordance with GS 143-215.30 and NCAC 15A-2K .0220, final written consent must be issued by the Director of the Division of Energy, Mineral, and Land Resources for impoundment to normal pool elevation and operation of this dam pursuant to these repairs. Also, draining of the lake shall be performed in such a manner as to preclude off-site sedimentation.

6. Prior to issuance of final written consent for use of this dam pursuant to these repairs, the requirements of Session Law 2014-122, Section 8, revised by Session Law 2015-7 must be met. Session Law 2015-7 requires all owners of high and intermediate hazard dams to submit an Emergency Action Plan (EAP) to the Department of Environment and Natural Resources (DENR) and the Department of Public Safety (DPS) no later than December 31, 2015. More detailed information may be found at the Division of Energy, Mineral, and Land Resources website noted on page one of this letter.

7. An operation and maintenance (O&M) plan is required for all high hazard dams. The O&M plan should address routine maintenance, frequency of piezometer readings, frequency of inspections by the owner or the owner's representative, and annual operation of the bottom drain to ensure that it is functional. The O&M plan must be received prior to issuance of final written consent for operation of the dam pursuant to these repairs.

8. This approval does not convey the right to access the private property of others. Any required access to perform the approved work must be secured prior to initiation of construction activities.

9. You must notify Mr. Brad Cole, PE, Regional Supervisor, Land Quality Section, 225 Green Street, Suite 714, Fayetteville, North Carolina 28301-5094, telephone number (910) 433-3300 ten days before the start of construction.

The U.S. Army Corps of Engineers and the Division of Water Resources of this Department should be contacted to determine if additional permits are required. Also, the erosion and sediment control program having jurisdiction should be contacted to determine permit requirements. In any case, sediment must be prevented from entering the waters of the state or flowing onto neighboring property.

Because the subject dam has known deficiencies and has been subject to previous enforcement action by this Division, it is essential that the approved repairs are implemented as soon as possible to protect public safety and eliminate the need for further enforcement actions. The repair schedule and impoundment elevation approved herein may be revised should further enforcement action be initiated.

For assistance you may contact the Fayetteville Regional Office at (910) 433-3300 or a staff member of the Dam Safety Program in the Raleigh Central Office at telephone number (919) 707-9220.

Sincerely,

Tracy E. Davis, PE, CPM
Director

TED/smm

Attachment

cc: Dr. B. Dan Marks, PE, Marks Enterprises of NC
Ms. Julie Watson, Woodlake Country Club
Mr. Brad Cole, PE, Land Quality Regional Supervisor
Surface Water Protection Regional Supervisor - FRO

Filename: MOORE-040_20150515_COAR_Repair_Woodlake Dam - Ph. I

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Woodlake CC Corp.
401 South Tryon Street, Suite 3000
Charlotte, North Carolina 28202

Woodlake-040

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☑ Certified Mail® ☐ Priority Mail Express™
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ Collect on Delivery

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

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PS Form 3811, July 2013 Domestic Return Receipt

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• Sender: Please print your name, address, and ZIP+4® in this box•

NCDENR Division of Land Resources-LQS
1612 Mail Service Center
Raleigh, North Carolina 27699-1612
Attn: Mr. Steven M. McEvoy, PE

MOORE-040

RDA

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald van der Vaart
Secretary

July 27, 2015

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Woodlake CC Corp.
c/o National Corporate Research, Ltd.
212 South Tryon Street; Suite 1000
Charlotte, North Carolina 28281

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Woodlake CC Corp.
401 South Tryon Street; Suite 3000
Charlotte, North Carolina 28202

RE: Woodlake Dam
Moore County
State Dam ID: MOORE-040
Cape Fear River Basin

Dear Sir or Madam:

Attached is an order, issued under the authority of the North Carolina Dam Safety Law of 1967, requiring that within 91 days the plans for repairs approved by this Division by letter dated May 15, 2015 be initiated or plans and schedule for breaching the subject dam located on Crains Creek in Moore County be developed by a North Carolina registered professional engineer and submitted to the Director of the Division of Energy, Mineral, and Land Resources. A copy of the North Carolina Dam Safety Law of 1967 is enclosed for your information.

If you wish to contest this Dam Safety Order, you must request a contested case hearing within 10 days after receiving this notice. This request must be in the form of a written petition that conforms to the requirements set forth in North Carolina General Statute (NCGS) 150B-23. The original petition and one copy must be filed as follows:

Office of Administrative Hearings
6714 Mail Service Center
Raleigh, North Carolina 27699

Any questions about filing a petition may be directed to the Clerk of the Office of Administrative Hearings by telephone at (919) 431-3000.

A copy of the petition must also be served on the Department as follows:

Mr. Sam M. Hayes, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, North Carolina 27699-1601

Please note that failure to comply with this Dam Safety Order may result in:

1. The assessment of a civil penalty of not less than $100.00 nor more than $500.00 for each day of violation. This penalty will begin to run from the deadline established in the Dam Safety Order; and/or

2. A request to the Attorney General's Office for injunctive relief.

If you have any questions, please contact me in writing or by telephone at:

Mr. William E. Vinson, PE, CPM
Section Chief
Land Quality Section
1612 Mail Service Center
Raleigh, North Carolina 27699-1612
Telephone: (919) 707-9220

We would appreciate your calling us as soon as you receive this notice so that we can be aware of your plans and schedule.

Sincerely,

William E. Vinson, PE, CPM
Section Chief
Land Quality Section

Enclosure

cc: Dr. B. Dan Marks, PE, Marks Enterprises of NC
Mr. Nick Mills, Land Quality Environmental Specialist – FRO
Surface Water Protection Regional Supervisor
Mr. Scot Brooks, CEM, Emergency Manager – Moore County
Ms. Julie Watson

DAM SAFETY ORDER

FINDINGS AND ORDER OF THE DIRECTOR
DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES

Woodlake CC Corp.
c/o National Corporate Research, Ltd.
212 South Tryon Street; Suite 1000
Charlotte, North Carolina 28281

Woodlake CC Corp.
401 South Tryon Street; Suite 3000
Charlotte, North Carolina 28202

RE: Woodlake Dam
Moore County
MOORE-040
Cape Fear River Basin

Order No.: DS 15-01

Pursuant to the authority contained in North Carolina General Statute (NCGS) 143-215.32 as delegated to the Director in the North Carolina Administrative Code, Title 15A, Subchapter 2K, Section .0302 (15A NCAC 2K.0302), I find the following:

1. Woodlake CC Corp. owns a dam on Crains Creek in Moore County. The dam is located approximately 2,450 feet northwest of the intersection of Lobelia Road (SR 690) and McGill Road (SR 2017).

2. The dam is approximately 23 feet in height and has an impoundment capacity of approximately 10,000 acre-feet at the top of the dam elevation.

3. The dam has the following deficiencies that threaten its integrity:

   A. Several cracks were noted in the concrete of the principal spillway of the dam. Areas of concern are located along the right side (as viewed facing downstream) subsurface drain outlets. All joints in the principal spillway are in need of maintenance or repair. In addition, large areas of spalling concrete are present at the entrance and outfall of the spillway.

   B. A void of unknown size is present at the bottom of the principal spillway. Unsuccessful attempts have been made to stabilize these voids with concrete debris at the end of the spillway.

   C. Voids are present along the right side (as viewed facing downstream) wing wall as well as at the subsurface drain outlet locations.

   D. Seepage was noted at various locations on the downstream slope of the dam.

4. The dam is classified in the high hazard category because failure of the dam poses a threat to human life and property downstream from the dam that includes downstream single-family residences at 3862 Lobelia Road and 1484, 1492, and 1494 McGill Road, as well as State Road

690 (Lobelia Road) and State Road 2017 (McGill Road). State Road 690 is a public roadway with a traffic count of approximately 4,000 vehicles per day (AADT). State Road 2017 is a public roadway with a traffic count of approximately 330 vehicles per day (AADT).

5. A Certificate of Approval to Repair for the subject dam was issued May 15, 2015, to Woodlake CC Corp, and was received by Woodlake CC Corp. on May 26, 2015. As part of that approval, Woodlake CC Corp. was notified that adherence to the approved construction schedule and impoundment drawdown elevation would be required to avoid further enforcement action by this Division. To date, no substantial site work has been performed to implement the approved repair plans.

6. As an elevation reference datum, the elevation at the top of the spillway gates is plan elevation 224.5 according to the repair plans approved by this Division by letter dated May 15, 2015.

Therefore, by the authority of NCGS 143-215.32(b) and 15A NCAC 2K.0302, it is hereby Ordered that:

1. The reservoir surface elevation shall be immediately drawn down to a maximum plan elevation of 218 feet and maintained at or below that elevation until repair, alteration, reconstruction, or breaching is accomplished pursuant to plans and specifications developed by a licensed engineer and approved by Tracy E. Davis, PE, CPM, Director, Division of Energy, Mineral, and Land Resources. Any devices necessary to control erosion and prevent discharge of sediment shall be installed in the interim. Re-impoundment will also require the issuance of a Certificate of Approval to Impound.

2.a. Woodlake CC Corp. shall within 91 days of the issue of this order, to wit October 27, 2015 initiate construction of the repairs approved by Tracy E. Davis, PE, CPM, Director, Division of Energy, Mineral, and Land Resources by letter dated May 15, 2015, in accordance with 15A NCAC 2K.0200. Task 2 of the approved construction schedule shall be completed no later than 90 calendar days after initiation of construction activities;

or

2.b. Woodlake CC Corp. shall within 91 days of the issue of this order, to wit October 27, 2015 submit an application to breach the dam in accordance with 15A NCAC 2K.0200 for approval by Tracy E. Davis, PE, CPM, Director, Division of Energy, Mineral, and Land Resources. A construction schedule prepared in accordance with 15A NCAC 2K.0213 including a date for initiation of breach activities shall be submitted for approval as part of this application. Strict adherence to the approved construction schedule will be required once approval is issued. All breach activities at this dam shall be conducted in a manner that will preclude the washing of sediment downstream.

7/28/2015
Date

Director, Division of Energy, Mineral, and Land Resources

DAM SAFETY INSPECTION REPORT

Name	County	No.	Inspected By	Date
Woodlake Dam	Moore	040	Nick Mills, Brad Cole, Diane Adams, Jodi Pace & Mike Lawyer	4-1-2014

Owner	Address	Phone No.
Woodlake Country Club	150 Woodland Blvd. Vass, NC 28394	

Type of Dam ☐Concrete Gravity ☐Concrete Arch ☐Other ☒Embankment ☒Concrete Buttress ☐Stone Masonry

Type of Inspection ☐Initial ☐Follow up ☒Periodic ☐Other

Site Conditions ☐Wet ☒Dry ☐Snow Cover ☐Other

Hazard Description
Hwy 690 & Residential Dwellings

Condition Assessment
☐Satisfactory ☒Fair ☐Poor ☐Unsatisfactory ☐Not rated

Hazard Class
☐Low (A) ☐Intermediate (B) ☒High (C)

Remarks
Water Level: 4-6 inches above Normal Pool

Principal Spillway: Active

Action
☐None ☐Maintenance ☐Monitoring ☐Minor Repair ☐Engineering

Recommendations
☐Inspection letter ☒Deficiency letter ☐RE notice ☐Engineering study ☐Inspection by RE ☐Inspection by DSE ☐Dam safety order ☐Enforcement ☐Periodic reinspection ☐Other reinspection

AREA	PROBLEMS	COMMENTS
UPSTREAM SLOPE / FACE	☐1. None ☐2. Trees ☐3. High bushes ☐4. Burrows ☒5. Wave erosion ☐6. Livestock damage ☐7. Slides ☐8. Depressions ☐9. Bulges ☐10. Sparse rip rap ☐11. Displaced rip rap ☐12. Cracks ☐13. Undermining ☐14. Holes ☐15. Spalling ☐16. Displaced joints ☐17. Deteriorated joints ☐18. Exposed reinforcement ☐19. Other	COVER: ☒Vegetation ☒Rip rap ☐Concrete ☐Asphalt ☐Other -Slight wave erosion on the upstream slope.
TOP OF DAM	☐1. None ☐2. Trees ☐3. High bushes ☐4. Burrows ☒5. Ruts ☐6. Livestock damage ☐7. Depressions ☐8. Unlevel ☐9. Misalignment ☐10. Has overtopped ☐11. Cracks ☐12. Spalling ☐13. Deteriorated joints ☐14. Displaced joints ☐15. Exposed reinforcement ☐16. Other	COVER: ☒Vegetation ☐Gravel ☐Concrete ☐Asphalt ☐Other -Ruts noted on top of the dam due to vehicle traffice. -Exposed soil on the top of dam
DOWNSTREAM SLOPE/ FACE	☐1. None ☐2. Trees ☒3. High bushes ☒4. Burrows ☐5. Erosion ☐6. Livestock damage ☐7. Slides ☒8. Depressions ☐9. Bulges ☒10. Wetness ☒11. Seepage ☐12. Boils ☐13. Cracks ☒14. Holes ☐15. Spalling ☐16. Displaced joints ☐17. Deteriorated joints ☐18. Exposed reinforcement ☐19. Other	COVER: ☐Vegetation ☐Rip rap ☐Concrete ☐Other -Seepage noted right side of principal spillway at 75, 100(FeO2), 125, 200, 250, and 350 yards. -Seepage noted left side of principal spillway at 100, 120, 150, and 170 yards. -holes 25 yards left side of principal spillway located at -holes right side of principal spillway at 125, 200, and 325 yards. -erosion gullies located 75 yards right side of principal spillway
TOE CONTACT	☐1. None ☒2. Trees ☒3. High bushes ☐4. Burrows ☐5. Erosion ☐6. Livestock damage ☐7. Slides ☐8. Depressions ☐9. Bulges ☐10. Wetness ☒11. Seepage ☐12. Boils ☐13. Cracks ☐14. Holes ☐15. Spalling ☐16. Displaced joints ☐17. Deteriorated joints ☐18. Exposed reinforcement ☐19. Other	COVER: ☒Vegetation ☐Rip rap ☐Concrete ☐Other Seepage noted right side 200 yards from principal spillway

AREA	PROBLEMS	COMMENTS
ABUTMENT CONTACTS	☐1. None ☐11. Seepage ☒2. Trees ☐12. Boils ☒3. High bushes ☐13. Cracks ☐4. Burrows ☐14. Holes ☐5. Erosion ☐15. Spalling ☐6. Livestock damage ☐16. Displaced joints ☐7. Slides ☐17. Deteriorated joints ☐8. Depressions ☐18. Exposed reinforcement ☐9. Bulges ☐19. Undermining ☐10. Wetness ☐20. Other	COVER: ☒Vegetation ☐Rip rap ☐Concrete ☐Other
PRINCIPAL SPILLWAY	☐1. None ☐11. Joint displacement ☐2. No trashguard ☐12. Undermined ☐3. Obstructed ☒13. Voids ☐4. Plugged ☐14. Erosion ☐5. Rusted ☐15. Holes ☐6. Damaged ☐16. Conduit collapsed ☐7. Gates leaking ☐17. Spalling ☒8. Joints leaking ☐18. Outlet undercutting ☐9. Cracks ☐19. Misalignment ☐10. Joint deterioration ☐20. Other	TYPE/SIZE: Concrete Chute with gates -Voids of unknown size located under principal spillway at the bottom right side. Concrete slabs have been placed in the void in attempt to fill it. -Void beneath toe drain right side of principal spillway. Sand bags have been placed around the toe drain since principal spillway is active. Void next to wing wall right side of principal spillway. -Joints in principal spillway cracking and deteriorated. Joints need sealing throught the principal spillway.
EMERGENCY SPILLWAY	☐1. None ☐11. Joint displacement ☐2. No ES ☐12. Undermined ☐3. Same as ES ☐13. Voids ☐4. Obstructed ☐14. Holes ☐5. Erosion ☐15. Exposed reinforcement ☐6. Displaced rip rap ☐16. Spalling ☐7. Sparse rip rap ☐17. Outlet erosion ☐8. Joints leaking ☐18. Misalignment ☐9. Cracks ☐19. Inadequate capacity ☐10. Joint deterioration ☐20. Other	TYPE/SIZE:
DRAINS / OTHER OUTLETS	☐1. None ☐2. No bottom drain ☐3. Bottom drain inoperable ☐4. Subsurface drain dry ☐5. Subsurface drain muddy flow ☐6. Subsurface drain obstructed ☐7. No animal guard ☒8. Other	TYPE: Four subsurface drains -Subsurface drain right side of principal spillway has a hole beneath outlet pipe. -All outlets of the subsurface drains need maintenance and repair. Joints are cracking and holes forming below outlets.

SKETCHED/COMMENTS:

(Downstream Slope Continued.)

-Void 300 yards right side of principal spillway

- Mid slope wetness and depressions right side of principal spillway 150 to 300 yards halfway up the downstream slope.
- Animal burrows noted 100 to 200 yards right side of principal spillway.

North Carolina Department of Environment and Natural Resources

Pat McCrory,
Governor

John E. Skvarla, III
Secretary

NOTICE OF DEFICIENCY

April 22, 2014

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
7010 3090 0001 3216 1396

Woodlake Country Club
Attn: Julie Watson
150 Woodland Blvd.
Vass, NC 28394

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
7010 3090 0001 3216 1389

Woodlake Partners
P.O. Box 648
Vass, NC 28394

RE: Woodlake Dam
Moore-040
Moore County North Carolina

Dear Ms. Watson:

The Dam Safety Law of 1967 provides for the certification and inspection of dams in the interest of public health, safety, and welfare, in order to reduce the risk of failure of dams, to prevent injuries to persons, damage to downstream property, and to ensure the maintenance of stream flows.

An inspection of the referenced dam was conducted on April 1, 2014 by staff of the Land Quality Section Fayetteville Regional Office. During this inspection, the following conditions were noted:

1. Several cracks were noted in the concrete of the principal spillway of the dam. Areas of concern are located along the right side subsurface drain outlets. All joints in the principal spillway are in need of maintenance and repair. In addition, spalling of concrete is occurring in large areas at the entrance of the spillway and at the bottom of the spillway.

2. An unknown size void was noted right of center at the bottom of the principal spillway. The sheet piling was noted to be decayed in this location and large voids and holes were noted behind sheet pilings right of center at the bottom of the principal spillway. Attempts have been made to fill or stabilize voids with pieces of concrete slabs.

3. Subsurface drain on lower right side wall has created a void along right side wing wall. In addition outlets of subsurface drains have created joint displacement and holes around subsurface drain outlets. Right side subsurface drain has hole below outlet and has been barricaded off with sand bags since principal spillway is active.

4. There was seepage noted on the downstream slope of the dam. Excessive seepage can cause failure of dam due to internal erosion and/or embankment sliding. You should inspect the seepage periodically and notify this office if there is an increase in the amount of seepage, discoloration of water or embankment sliding occurs.

These conditions appear serious and justify further engineering study to determine appropriate remedial measures. In the event of a dam failure, human life and significant property would be endangered. Therefore, we are listing your dam in the High Hazard category.

In order to ensure the safety of this dam, you are directed to retain the services of a registered professional engineer or an experienced engineering firm to make a study of the conditions outlined in this letter. Plans and specifications for repair based on the results of the study must be filed with the Division of Land Resources for approval pursuant to the North Carolina Administrative Code, Title 15A, Subchapter 2K - Dam Safety (15A NCAC 2K). Two copies of an emergency action plan for this dam shall be submitted to this office by May 22, 2014.

In addition to the above, the following remedial actions, not requiring design or approval, should be completed by July 22, 2014. These items include the following:

1. Maintain a ground cover sufficient to restrain accelerated erosion on all earthern portions of the structure.

2. Periodically remove trees less than about six inches in diameter and thick undergrowth from the slopes and crest of the dam. This will serve to (A) prevent the formation of a root system which might significantly increase seepage through the dam which could ultimately result in failure of the structure, (B) reduce the possibility of damage to the dam due to the uprooting of trees by wind or other natural causes, and (C) facilitate ease of inspection and increase the likelihood of early detection of more serious problems connected with the dam.

3. Periodically remove all trees from the emergency spillway. This will reduce the possibility of its capacity being reduced by the entrapment of debris, should it become active.

4. Periodically check the operation of all drain valve facilities. This will insure satisfactory operation of the drains should an emergency situation arise.

5. Periodically monitor the subject dam and appurtenant works with respect to elements affecting its safety. This is in light of the legal duties, obligations, and liabilities arising from the ownership and/or operation of a dam.

6. Periodically monitor seepage that was noted at the following locations: -Right Side of Principal Spillway located approximately 75, 100,125, 200, 250, and 350 yards from principal spillway. Left Side of Principal Spillway located approximately 100, 120, 150 and 170 yards from principal spillway

As a dam owner, you may incur liability should your dam have a problem or fail, if such an event results in loss of life, property damage, or environmental damage downstream. It is therefore requested that you prepare an Emergency Action Plan (EAP) for this dam. The EAP establishes procedures to be followed in events that could adversely impact the dam such as extreme precipitation, seismic activity, excessive seepage, slides, sinkholes, and other natural hazards, and for warning the public downstream in the event of an emergency at the dam. Guidance for preparing an EAP can be found on the Internet at http://portal.ncdenr.org/web/lr/dams or by calling Dam Safety Program staff at (919) 707-9220. Two copies of an EAP for this dam should be submitted to the following address:

NC Division of Land Resources
Land Quality Section
Attn: Mr. Steven M. McEvoy, PE
1612 Mail Service Center
Raleigh, NC 27699-1612

Please contact us at 910-433-3300 to advise us of your intended action in this matter. If we do not receive notification on or before May 22, 2014 we shall present the case information for appropriate enforcement action. Enforcement action could include a civil penalty of up to $500.00 per day of violation, and/or issuance of a Dam Safety Order requiring the repair or removal of this dam, and/or injunctive relief to gain compliance.

Sincerely,

Brad Cole, PE
Regional Engineer

BC/nm

cc: Fayetteville Regional Office File

MARKS ENTERPRISES of NC, PLLC

One Palatka Street - Arden, NC 28704
Tel: 828-231-7424 Fax: 828-681-8909

December 4, 2014

State of North Carolina
Department of Environment and Natural Resources
Division of Energy, Mineral, and Land Resources
Land Quality Section, Dam Safety Group
1612 Mail Service Center
Raleigh, North Carolina 27699 – 1612

Attention: Mr. Steven M. McEvoy, P.E.
State Dam Safety Engineer

Reference: PROJECT WORK, SCHEDULE, AND COST BREAKDOWN
Woodlake Dam & Spillway Remediation Project
NCID No. MOORE – 040
Woodlake Resort and Country Club
Vass, Moore County, North Carolina
Project No. ME – 09 – 007

Dear Mr. McEvoy:

The purpose of this letter is to provide the requested detailed breakdown of project work, schedule, and cost for the sequential or staged construction that will be required to complete the referenced project under the current Chapter 11 Bankruptcy Proceeding. As per our previous agreement, the project design and associated Construction Plans and Specifications were previously divided into two (2) phases to allow remediation construction to be completed in two (2) successive winter drawdown periods. The Phase I Construction Plans and Specifications have been reviewed by your office and review comments submitted in the letter dated October 6, 2014.

Woodlake Partners, LLC (the "Owner" of Woodlake Dam and its appurtenances and amenities) has identified a group of investors that may be willing acquire the property through a plan of reorganization which includes a sale of the property subject to higher and better bids and approval by the Bankruptcy Court. The Phase I: Spillway Slabs and Walls portion of the project has been bid at a cost of approximately $1.8 Million. Understandably, the new investors are reluctant to commit to an initial lump sum investment of this magnitude until they are satisfied that the dam remediation project is proceeding in a manner which has been approved by the Bankruptcy Court.

In order to present a plan and sale which may be acceptable to the potential purchaser or other investors, the Owner is requesting concurrence from the Department of Environment and Natural Resources (DENR) to further dividing the presented Phase I Dam Remediation Construction.

The Project Engineer has completed extensive analyses and evaluations of the project work, schedule, and itemized construction costs associated with each item set forth in the developed Critical Path Method of construction scheduling in order to present a sequential or staged construction plan that meets with your requirements set forth in our previous conversations concerning staged dam remediation construction. There are many issues that must be addressed in this method of construction; however, there is no issue of greater importance than that of assuring that the dam, spillway, and other appurtenances are left in safe operating conditions between the completions of individual stages of construction. Furthermore, construction workmanship quality, schedule, and financial control of staged construction projects are much more demanding of the Project Engineer and the Project Superintendent.

As such, the Project Engineer is scheduled to be on-site approximately seventy-five (75) to eighty (80) percent of the duration time of the project. This will include time that the Contractor is not working since concrete curing and testing will be done on-site and the Project Engineer will have to fill-in for inspectors/technicians that may be off-work on scheduled alternate weekends. The Project Engineer will make all decisions concerning field changes, and/or substitution of materials, and /or alteration of construction techniques. Similarly, the Contractor will have his Office Manager and Financial Administrator on-site during the entire project.

The Project Engineer and I have considered several alternative means of presenting details of the proposed project breakdown. The following tabulated summary of project task work, anticipated schedule, and associated costs reinforced by an attached spreadsheet exhibit is considered to be the best manner in which to present the significant amount of information in the most organized fashion. In addition, existing Phase I Construction Plans and Specifications will be modified so that sequential task drawings and details are presented in the same sequential order as the project schedule.

Please be aware that schedule dates presented herein are subject to change in accordance with the reorganization plan and sale process, all of which require final approval by the Bankruptcy Court. The "Project Team" for this project will

not only include representatives of the State Dam Safety Engineer, Owner, Engineer, and Contractor; but will be expanded by involvement of the Chief Restructuring Officer and Bankruptcy Attorney. As such, the Project Engineer has used a realistic degree of conservatism in establishing the construction schedule. After all is said and done, the actual initiation of each identified construction task will be controlled by the investors who acquire ownership through the Chapter 11 sale.

TABULATED SUMMARY OF PHASE I CONSTRUCTION ITEMS

The Construction Plans and Specifications for Phase I: Spillway Slabs and Walls were originally divided into two (2) major components that included: 1) Non-Regulated Construction Activities; and 2) Regulated Construction Activities. This division was made to allow construction to begin at the earliest possible date even if the final Approval to Repair Certificate had not been issued by the Department of Environment and Natural Resources (DENR) since these activities do not involve any elements of the dam or its appurtenances. The second component of the Phase I Construction Plans and Specifications involve regulated dam safety activities that impact the safety of the dam and/or its appurtenances.

Marks Enterprises of NC, PLLC (Marks Enterprises) was notified by Mr. John Northen, Chapter 11 Bankruptcy Attorney, on November 3, 2014 that Marks Enterprises had been approved by the Court to continue to provide professional engineering services to the Owner. The first order of business involved conference telephone calls to outline a preliminary schedule of events that included a range of investment amount and the approximate timing of the investment. The Owner requested a breakdown of the project so that concurrence could be obtained from DENR. The previously referenced analyses and evaluations have resulted in the publication of this document. Mr. Northen further advised that Marks Enterprises should proceed with engineering services associated with obtaining an Approval to Repair Certificate from DENR. Based upon our current workload and the upcoming holiday season we anticipate having the revised Plans and Specifications for the Phase I Construction back to DENR by January 9, 2014.

TASK	DESCRIPTION OF ACTIVITIES	DATE	FUNDING
1.	Non-Regulated Construction Items	01-16-15	
	a. Construction Access Roads		$116K
	b. Secured Equip. & Matls. Yard		$ 16K
	c. Office Trailer & Concrete Lab		$ 32K
		Subtotal	$164K
2.	Regulated Construction Items	02-20-15	
	a. Remove Rear Wall of Splash Pool		$ 50K
	b. Replace Rear Wall of Splash Pool		$ 90K
	c. Remove & Replace Splash Pool Slabs		$200K
		Subtotal	$340K
		TOTAL	$504K

Notes: Task 1 will begin before receipt of Approval to Repair
Task 2 will not begin before receipt of Approval to Repair
Task 2 is estimated to be completed by 05-15-2015
Site Clean-up and Demobilization by 05-22-2015
Project Engineer will conduct Monthly Inspections until
Task 3 begins

3.	Reinforcement of Spillway Walls	11-01-2015	$160K
4.	Remove and Replace 50% Spillway Slabs		$490K
		TOTAL	$650K

Notes: The funding for Tasks 3 & 4 is the estimated construction
Cost. Task 4 will be completed by May 1, 2016

5.	Complete 50% of Spillway Slabs	11-01-2016	$490K
6.	New Walkway & Gate Liter Foundations		$160K
		TOTAL	$650K

Notes: The funding for Tasks 5 & 6 is the estimated construction
Cost. Task 6 will be completed by May 1, 2017

THIS WILL CONCLUDE THE WORK FOR PHASE I

Phase II of the dam remediation plans and specifications for Woodlake Dam have not been prepared at this time; however, preliminary design concepts and details were developed prior to the decision to divide the Construction Plans and Specifications into two (2) documents. As such, these preliminary plans have been utilized to estimate the construction cost of Phase II and establish a construction schedule. The Phase II portion of the dam remediation will consist of three (3) components of approximately equal cost and construction time.

Phase II: Spillway Wall and Embankment Seepage Control

7.	New Crossway & Gate Lifters	11–01- 2017	$250K
8.	Sheetpile Walls and External Wall Subdrains		$250K
9.	Embankment Subdrains and Toe Drains		$200K
		TOTAL	$700K

PROJECT GRAND TOTAL $2.5 M

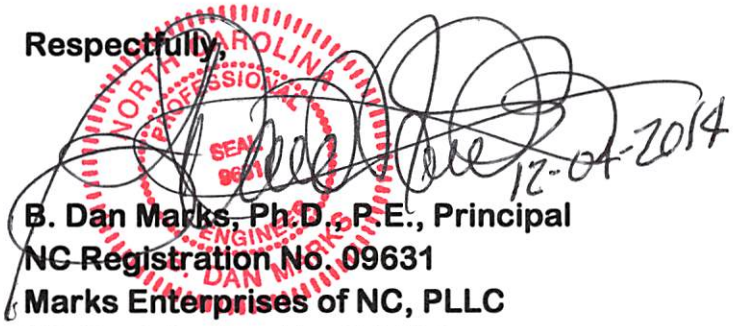
Adjustments in construction cost will have to be made at the conclusion of each construction period so that a more accurate assessment of project costs can be made to present to the Bankruptcy Court, Investors, and Owner.

THE DAM REMEDIATION PROJECT FOR WOODLAKE DAM AND ITS SPILLWAY SHOULD BE COMPLETED WITH TASK 9. IN MAY 2018

CLOSURE

Marks Enterprises extends our sincere appreciation for your assistance throughout this project. We believe the Owner is sincere in its desire to bring Woodlake Dam into a condition that will provide protection of residents and landowners downstream of the Woodlake Resort and Country Club. As you are aware, the Woodlake Dam provides significant flooding protection to downstream property owners and the integrity of Woodlake Dam and its appurtenances must be paramount to the Woodlake Community. If there are questions that arise during your review of this document please contact me at your convenience, I will be happy to travel to your office to discuss any issues that you feel can be best worked out in person with drawings before us.

Respectfully,



B. Dan Marks, Ph.D., P.E., Principal
NC Registration No. 09631
Marks Enterprises of NC, PLLC
NC Registration No. P-0199

Attachment: **WOODLAKE DAM REMEDIATION PROJECT BREAKDOWN**

Cc:

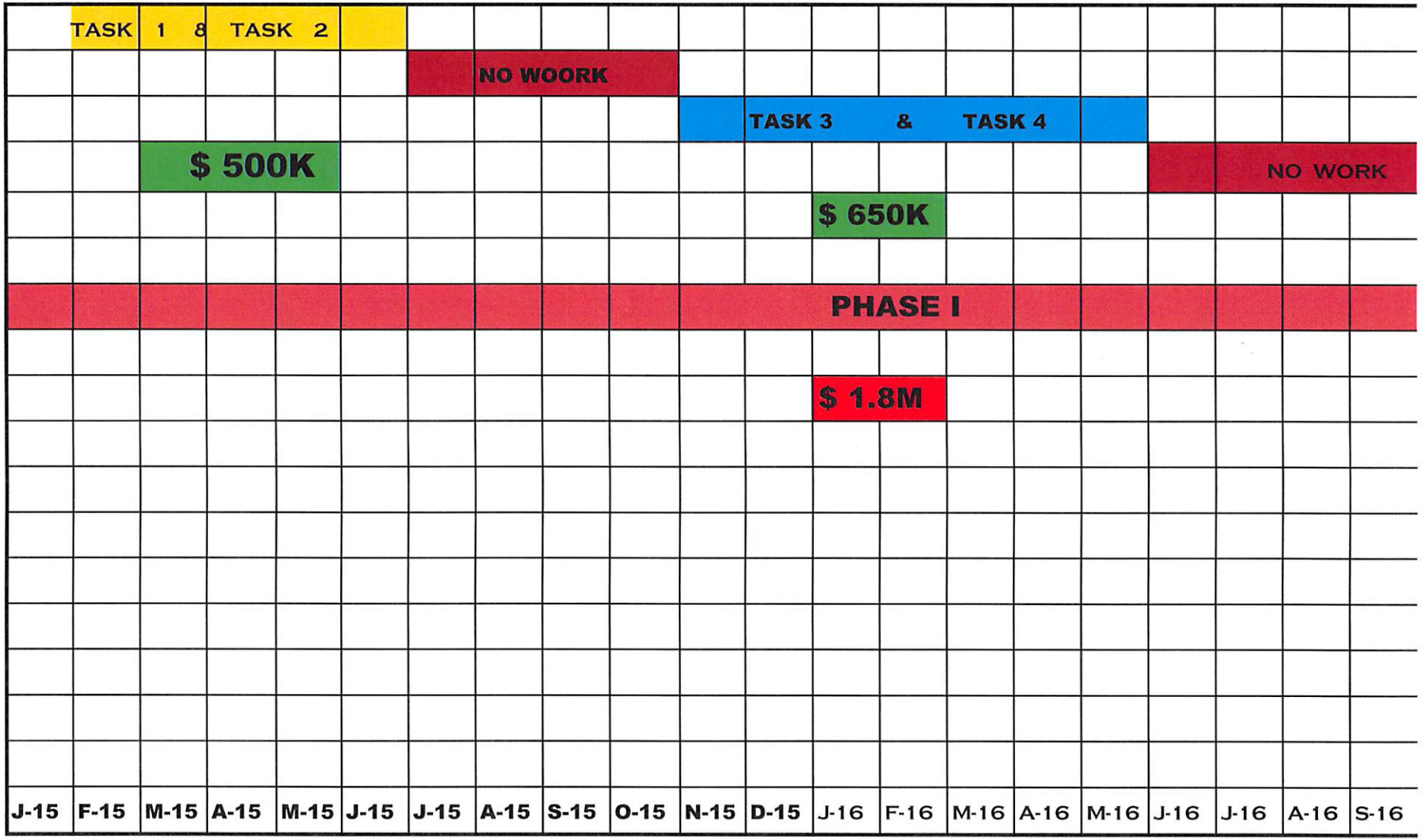
Mr. John Northen, Esq., Bankruptcy Attorney for Owner
Mr. Richard M. Hutson II, Chief Restructuring Officer for Owner

BDM/dm

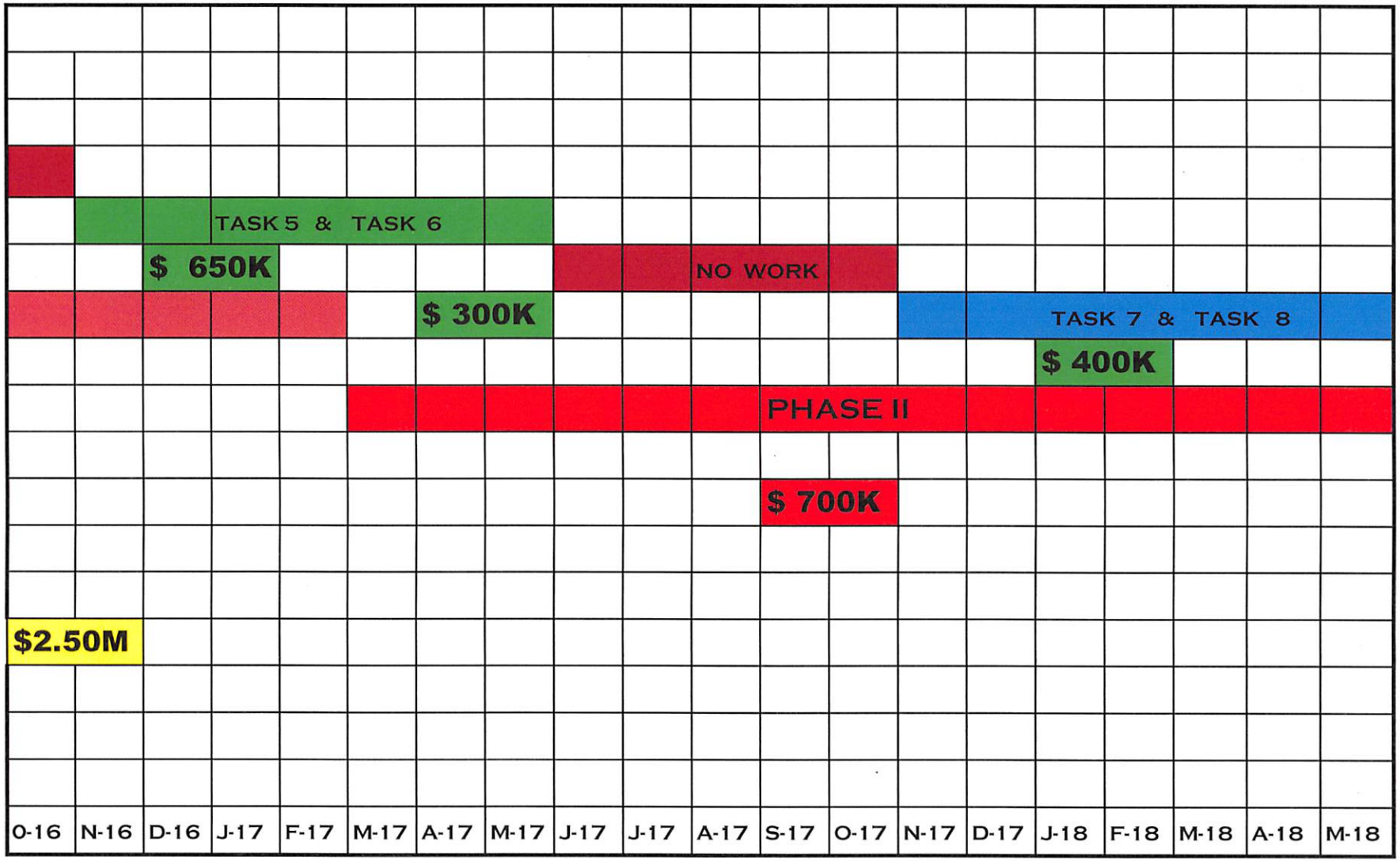
EXHIBIT

PROJECT SCHEDULE & COST ESTIMATES

DAM REMEDIATION PROJECT 2014-12-04



DAM REMEDIATION PROJECT 2014-12-04



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

December 15, 2014

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Woodlake Partners, LLC
c/o Woodlake Country Club
Attn: Ms. Julie Watson, Registered Agent
150 Woodland Boulevard
Vass, North Carolina 28394

Woodlake Partners, LLC
Attn: Ms. Julie Watson, Registered Agent
Post Office Box 648
Vass, North Carolina 28394

RE: Woodlake Dam
Moore County
State Dam ID: MOORE-040
Cape Fear River Basin

Dear Ms. Watson:

Attached is an order, issued under the authority of the North Carolina Dam Safety Law of 1967, requiring that within 91 days plans and schedule for repairing or breaching the subject dam located on Crains Creek in Moore County be developed by a North Carolina registered professional engineer and submitted to the Director of the Division of Energy, Mineral, and Land Resources. A copy of the North Carolina Dam Safety Law of 1967 is enclosed for your information.

If you wish to contest this Dam Safety Order, you must request a contested case hearing within 10 days after receiving this notice. This request must be in the form of a written petition that conforms to the requirements set forth in North Carolina General Statute (NCGS) 150B-23. The original petition and one copy must be filed as follows:

Office of Administrative Hearings
6714 Mail Service Center
Raleigh, North Carolina 27699

Any questions about filing a petition may be directed to the Clerk of the Office of Administrative Hearings by telephone at (919) 431-3000.

A copy of the petition must also be served on the Department as follows:

Mr. John Evans, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, North Carolina 27699-1601

Please note that failure to comply with this Dam Safety Order may result in:

1. The assessment of a civil penalty of not less than $100.00 nor more than $500.00. In the case of a willful failure to comply with this Dam Safety Order, a civil penalty may be imposed in an amount up to $500.00 for each day of violation. This penalty will begin to run from the deadline established in the Dam Safety Order; and/or

2. A request to the Attorney General's Office for injunctive relief.

If you have any questions, please contact either:

Mr. Brad Cole, PE
Regional Supervisor
Land Quality Section
225 Green Street, Suite 714
Fayetteville, North Carolina 28301
Telephone: (910) 433-3300

Or

Mr. Steven M. McEvoy, PE
State Dam Safety Engineer
Land Quality Section
1612 Mail Service Center
Raleigh, North Carolina 27699-1612
Telephone: (919) 707-9220

We would appreciate your calling us as soon as you receive this notice so that we can be aware of your plans and schedule.

Sincerely,

Steven M. McEvoy, PE
State Dam Safety Engineer

Enclosure

cc: Dr. B. Dan Marks, PE, Marks Enterprises
Surface Water Protection Regional Supervisor - FRO
Mr. Brad Cole, PE, Land Quality Regional Supervisor
Mr. Scot Brooks, CEM, Moore County Emergency Management

DAM SAFETY ORDER

FINDINGS AND ORDER OF THE DIRECTOR
DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES

Woodlake Partners, LLC
c/o Woodlake Country Club
Attn: Ms. Julie Watson, Registered Agent
150 Woodland Boulevard
Vass, North Carolina 28394

Woodlake Partners, LLC
Attn: Ms. Julie Watson, Registered Agent
Post Office Box 648
Vass, North Carolina 28394

RE: Woodlake Dam
Moore County
MOORE-040
Cape Fear River Basin

Order No. DS 14-05

Pursuant to the authority contained in North Carolina General Statute (NCGS) 143-215.32 as delegated to the Director in the North Carolina Administrative Code, Title 15A, Subchapter 2K, Section .0302 (15A NCAC 2K.0302), I find the following:

1. Woodlake Partners owns a dam on Crains Creek in Moore County. The dam is located approximately 2450 feet northwest of the intersection of Lobelia Road (SR 690) and McGill Road (SR 2017).

2. The dam is approximately 23 feet in height and has an impoundment capacity of approximately 10,000 acre-feet at the top of dam elevation.

3. The dam has the following deficiencies that threaten its integrity:

   A. Several cracks were noted in the concrete of the principal spillway of the dam. Areas of concern are located along the right side (as viewed facing downstream) subsurface drain outlets. All joints in the principal spillway are in need of maintenance or repair. In addition, large areas of spalling concrete are present at the entrance and outfall of the spillway.

   B. A void of unknown size is present at the bottom of the principal spillway. Unsuccessful attempts have been made to fill and stabilize these voids with concrete debris.

   C. Voids are present along the right side (as viewed facing downstream) wing wall as well as at the subsurface drain outlet locations.

   D. Seepage was noted at various locations on the downstream slope of the dam.

4. The dam is classified in the high hazard category because failure of the dam poses a threat to human life and property downstream from the dam that includes downstream single-family residences at 3862 Lobelia Road and 1484, 1492, and 1494 McGill Road, as well as State

Road 690 (Lobelia Road) and State Road 2017 (McGill Road). State Road 690 is a public roadway with a traffic count of approximately 4000 vehicles per day (AADT). State Road 2017 is a public roadway with a traffic count of approximately 330 vehicles per day (AADT).

5. Woodlake Partners was notified of the deficiencies of the dam in a letter dated April 22, 2014. This letter requested that a registered professional engineer be retained to make a study, and to prepare plans and specifications for the repair of the dam based on the results of the study.

   A repair plan was submitted by a registered professional engineer that identified and addressed various structural and other deficiencies at the dam. A response letter was issued requiring revisions and additional information be provided prior to approval of the repair plan by the Division of Energy, Mineral, and Land Resources. Except for a proposed project work schedule received on December 6, 2014, none of the required additional information or revisions has been submitted to this Division. The option to submit a new and different repair plan is also available.

   As of the date of last inspection, April 4, 2014, there has been no improvement in the conditions at the dam.

Therefore, by the authority of NCGS 143-215.32(b) and 15A NCAC 2K.0302, it is hereby Ordered that:

1. The reservoir shall be immediately lowered not less than 3 feet from normal pool elevation and maintained in that lowered condition until repair, alteration, reconstruction or breaching is accomplished pursuant to plans and specifications developed by a licensed engineer and approved by Tracy E. Davis, PE, Director, Division of Energy, Mineral, and Land Resources. Re-impoundment will also require the issuance of an Approval to Impound.

2.a. Woodlake Partners shall within 91 days of the issue of this order, to wit March 16, 2015 submit a revised application to repair the deficiencies of the dam in accordance with 15A NCAC 2K.0200 for approval by Tracy E. Davis, PE, Director, Division of Energy, Mineral, and Land Resources. A construction schedule prepared in accordance with 15A NCAC 2K.0213 including a date for initiation of repair activities shall be submitted for approval as part of this application. Strict adherence to the approved construction schedule will be required once approval is issued;

<u>or</u>

2.b. Woodlake Partners shall within 91 days of the issue of this order, to wit March 16, 2015 submit an application to breach the dam in accordance with 15A NCAC 2K.0200 for approval by Tracy E. Davis, PE, Director, Division of Energy, Mineral, and Land Resources. A construction schedule prepared in accordance with 15A NCAC 2K.0213 including a date for initiation of breach activities shall be submitted for

approval as part of this application. Strict adherence to the approved construction schedule will be required once approval is issued. Breach of this dam shall be done in a manner that will preclude the washing of sediment downstream.

12/15/2014
Date

Director, Division of Energy, Mineral, and Land Resources

Dam Safety Law

§ 143-215.23. Short title.

This Part shall be known and may be cited as the Dam Safety Law of 1967. (1967, c. 1068, s. 1.)

§ 143-215.24. Declaration of purpose.

It is the purpose of this Part to provide for the certification and inspection of dams in the interest of public health, safety, and welfare, in order to reduce the risk of failure of dams; to prevent injuries to persons, damage to downstream property and loss of reservoir storage; and to ensure maintenance of minimum stream flows of adequate quantity and quality below dams. (1967, c. 1068, s. 2; 1977, c. 878, s. 1; 1993, c. 394, s. 1.)

§ 143-215.25. Definitions.

As used in this Part, unless the context otherwise requires:

(1) "Dam" means a structure and appurtenant works erected to impound or divert water.

(2) "Minimum stream flow" or "minimum flow" means a stream flow of a quantity and quality sufficient in the judgment of the Department to meet and maintain stream classifications and water quality standards established by the Department under G.S. 143-214.1 and applicable to the waters affected by the project under consideration, and to maintain aquatic habitat in the length of the stream that is affected. (1967, c. 1068, s. 3; 1973, c. 1262, ss. 23, 38; 1977, c. 771, s. 4; c. 878, ss. 2, 4; 1983, c. 306; 1987, c. 827, ss. 154, 175; 1993, c. 394, s. 2.)

§ 143-215.25A. Exempt dams.

(a) Except as otherwise provided in this Part, this Part does not apply to any dam:

(1) Constructed by the United States Army Corps of Engineers, the Tennessee Valley Authority, or another agency of the United States government, when the agency designed or approved plans for the dam and supervised its construction.

(2) Constructed with financial assistance from the United States Soil Conservation Service, when that agency designed or approved plans for the dam and supervised its construction.

(3) Licensed by the Federal Energy Regulatory Commission, or for which a license application is pending with the Federal Energy Regulatory Commission.

(4) For use in connection with electric generating facilities regulated by the Nuclear Regulatory Commission.

(5) Under a single private ownership that provides protection only to land or other property under the same ownership and that does not pose a threat to human life or property below the dam.

(6) That is less than 25 feet in height or that has an impoundment capacity of less than 50 acre-feet, unless the Department determines that failure of the dam could result in loss of human life or significant damage to property below the dam. (2011)

(7) Constructed for the purpose of providing water for agricultural use, when a person who is licensed as a professional engineer under Chapter 89C of the General Statutes designed or approved plans for the dam, supervised its construction, and registered the dam with the Division of Land Resources of the Department. This exemption shall not apply to dams that are determined to be high-hazard by the Department. (2011)

(b) The exemption from this Part for a dam described in subdivisions (1) and (2) of subsection (a) of this section does not apply after the supervising federal agency relinquishes authority for the operation and maintenance of the dam to a local entity. (1993, c. 394, s. 3; 2009-390, s. 3(a); 2011-394, s. 10(a).)

§ 143-215.26. Construction of dams.

(a) No person shall begin the construction of any dam until at least 10 days after filing with the Department a statement concerning its height, impoundment capacity, purpose, location and other information required by the Department. A person who constructs a dam, including a dam that is otherwise exempt from this Part under subdivisions (4) or (5) of G.S. 143-215.25A(a), shall comply with the malaria control requirements of the Department. If on the basis of this information the Department is of the opinion that the proposed dam is not exempt from the provisions of this Part, it shall so notify the applicant, and construction shall not be commenced until a full application is filed by the applicant and approved as provided by G.S. 143-215.29. The Department may also require of applicants so notified the filing of any additional information it deems necessary, including, but not limited to, streamflow and rainfall data, maps, plans and specifications. Every applicant for approval of a dam subject to the provisions of this Part shall also file with the Department the certificate of an engineer legally qualified in this State. The certificate shall state that the person who files the certificate is responsible for the design of the dam and that the design is safe and adequate.

(b) The Department shall send a copy of each completed application to the State Health Director, the Wildlife Resources Commission, the Department of Transportation, and other State and local agencies it considers appropriate for review and comment. (1967, c. 1068, s. 4; 1973, c. 476, s. 128; c. 507, s. 5; c. 1262, s. 23; 1987, c. 827, s. 176; 1989, c. 727, s. 163; 1993, c. 394, s. 4; 1995, c. 509, s. 80.)

§ 143-215.27. Repair, alteration, or removal of dam.

(a) Before commencing the repair, alteration or removal of a dam, application shall be made for written approval by the Department, except as otherwise provided by this Part. The application shall state the name and address of the applicant, shall adequately detail the changes it proposes to effect and shall be accompanied by maps, plans and specifications setting forth such details and dimensions as the Department requires. The Department may waive any such requirements. The application shall give such other information concerning the dam and reservoir required by the Department, such information concerning the safety of any change as it may require, and shall state the proposed time of commencement and completion of the work. When an application has been completed it may be referred by the Department for agency review and report, as provided by subsection (b) of G.S. 143-215.26 in the case of original construction.

(b) When repairs are necessary to safeguard life and property they may be started immediately but the Department shall be notified forthwith of the proposed repairs and of the work under way, and they shall be made to conform to its orders. (1967, c. 1068, s. 5; 1979, c. 55, s. 1.)

§ 143-215.28. Action by Commission upon applications.

(a) Following receipt of agency comments the Commission shall approve, disapprove, or approve subject to conditions necessary to ensure safety and to satisfy minimum stream flow requirements, all applications made pursuant to this Part.

(b) A defective application shall not be rejected but notice of the defects shall be sent to the applicant by registered mail. If the applicant fails to file a perfected application within 30 days the original shall be canceled unless further time is allowed.

(c) If the Commission disapproves an application, one copy shall be returned with a statement of its objections. If an application is approved, the approval shall be attached thereto, and a copy returned by registered mail. Approval shall be granted under terms, conditions and limitations which the Commission deems necessary to safeguard life and property.

(d) Construction shall be commenced within one year after the date of approval of the application or such approval is void. The Commission upon written application and good cause shown may extend the time for commencing construction. Notice by registered mail shall be given the Commission at least 10 days before construction is commenced. (1967, c. 1068, s. 6; 1973, c. 1262, s. 23; 1987, c. 827, s. 154.)

§ 143-215.28A. Application fees.

(a) In accordance with G.S. 143-215.3(a)(1a), the Commission may establish a fee schedule for processing applications for approvals of construction or removal of dams issued under this Part. In establishing the fee schedule, the Commission shall consider the administrative and personnel costs incurred by the Department for processing the applications and for related compliance activities. The total amount of fees collected in any fiscal year may not exceed one-third of the total personnel and administrative costs incurred by the Department for processing the applications and for related compliance activities in the prior fiscal year. An approval fee may not exceed the larger of two hundred dollars ($200.00) or two percent (2%) of the actual cost of construction or removal of the applicable dam. The provisions of G.S. 143-215.3(a)(1b) do not apply to these fees.

(b) The Dam Safety Account is established as a nonreverting account within the Department. Fees collected under this section shall be credited to the Account and shall be applied to the costs of administering this Part. (1989 (Reg. Sess., 1990), c. 976, s. 1; 1991 (Reg. Sess., 1992), c. 1039, s. 15; 1993, c. 394, s. 5.)

§ 143-215.29. Supervision by qualified engineers; reports and modification during work.

(a) Any project for which the Commission's approval is required under G.S. 143-215.26, 143-215.27, and 143-215.28, and any project undertaken pursuant to an order of the Commission issued pursuant to this section or G.S. 143-215.32 shall be designed and supervised by an engineer legally qualified in the State of North Carolina.

(b) During the construction, enlargement, repair, alteration or removal of a dam, the Commission may require such progress reports from the supervising engineer as it deems necessary.

(c) If during construction, reconstruction, repair, alteration or enlargement of any dam, the Commission finds the work is not being done in accordance with the provisions of the approval and the approved plans and specifications, it shall give written notice by registered mail or personal service to the person who received the approval and to the person in charge of construction at the dam. The notice shall state the particulars in which compliance has not been made, and shall order immediate compliance with the terms of the approval, and the approved plans and specifications. The Commission may order that no further construction work be undertaken until such compliance has been effected and approved by the Commission. A failure to comply with the approval and the approved plans and specifications shall render the approval revocable unless compliance is made after notice as provided in this section. (1967, c. 1068, s. 7; 1973, c. 1262, s. 23; 1977, c. 878, s. 5; 1987, c. 827, s. 154.)

§ 143-215.30. Notice of completion; certification of final approval.

(a) Immediately upon completion, enlargement, repair, alteration or removal of a dam, notice of completion shall be given the Commission. As soon as possible thereafter supplementary drawings or descriptive matter showing or describing the dam as actually constructed shall be filed with the Department in such detail as the Commission may require.

(b) When an existing dam is enlarged, the supplementary drawings and descriptive matter need apply only to the new work.

(c) The completed work shall be inspected by the supervising engineers, and upon finding that the work has been done as required and that the dam is safe and satisfies minimum streamflow requirements, they shall file with the Department a certificate that the work has been completed in accordance with approved design, plans, specifications and other requirements. Unless the Commission has reason to believe that the dam is unsafe or is not in compliance with any applicable rule or law, the Commission shall grant final approval of the work in accordance with the certificate, subject to such terms as it deems necessary for the protection of life and property.

(d) Pending issuance of the Commission's final approval, the dam shall not be used except on written consent of the Commission, subject to conditions it may impose. (1967, c. 1068, s. 8; 1973, c. 1262, s. 23; 1987, c. 827, ss. 154, 177.)

§ 143-215.31. Supervision over maintenance and operation of dams.

(a) The Commission shall have jurisdiction and supervision over the maintenance and operation of dams to safeguard life and property and to satisfy minimum streamflow requirements. The Commission may adopt standards for the maintenance and operation of dams as may be necessary for the purposes of this Part. The Commission may vary the standards applicable to various dams, giving due consideration to the minimum flow requirements of the stream, the type and location of the structure, the hazards to which it may be exposed, and the peril of life and property in the event of failure of a dam to perform its function.

(b) The Department, consistent with rules adopted by the Commission, may impose any condition or requirement in orders and written approvals issued under this Part that is necessary to ensure that stream classifications, water quality standards, and aquatic habitat requirements are met and maintained, including conditions and requirements relating to the release or discharge of designated flows from dams, the location and design of water intakes and outlets, the amount and timing of the withdrawal of water from a reservoir, and the construction of submerged weirs or other devices intended to maintain minimum streamflows.

The Commission shall adopt rules that specify the minimum streamflow in the length of the stream affected.

(c) The minimum streamflow in the length of the stream affected by a dam that is operated by a small power producer, as defined in G.S. 62-3(27a), that diverts water from 4,000 feet or less of the natural streambed and where the water is returned to the same stream shall be:

(1) The minimum average flow for a period of seven consecutive days that would have an average occurrence of once in 10 years in the absence of the dam, or ten percent (10%) of the average annual flow of the stream in the absence of the dam, whichever is less, if prior to 1 January 1995 the small power producer was either licensed by the Federal Energy Regulatory Commission or held a certificate of public convenience and necessity issued by the North Carolina Utilities Commission.

(2) The minimum average flow for a period of seven consecutive days that would have an average occurrence of once in 10 years in the absence of the dam, or ten percent (10%) of the average annual flow of the stream in the absence of the dam, whichever is greater, if subdivision (1) of this subsection does not apply.

(3) To protect the habitat of the Cape Fear Shiner and other aquatic species, 28 cubic feet per second for any dam that diverts water from 2,500 feet or more of the natural streambed of any stream on which six or more dams operated by small power producers were located on 1 January 1995, notwithstanding subdivisions (1) and (2) of this subsection.

(d) Subsection (c) of this section establishes the policy of this State with respect to minimum streamflows in the length of the stream affected by a dam that is operated by a small power producer, as defined in G.S. 62-3(27a), that diverts water from 4,000 feet or less of the natural streambed and where the water is returned to the same stream, whether the dam is subject to or exempt from this Part. In its comments and recommendations to the Federal Energy Regulatory Commission regarding the minimum streamflow in the length of the stream affected by a dam that is operated by a small power producer, as defined in G.S. 62-3(27a), that diverts water from 4,000 feet or less of the natural streambed and where the water is returned to the same stream, the Commission and the Department shall not advocate or recommend a minimum streamflow that exceeds the minimum streamflow that would be required under subsection (c) of this section.

(e) The minimum streamflow in the length of the stream affected by a dam to which subsections (c) and (d) of this section do not apply shall be established as provided in subsection (b) of this section. Subsections (c) and (d) of this section do not apply if the length of the stream affected:

(1) Receives a discharge of waste from a treatment works for which a permit is required under Part 1 of this Article; or

(2) Includes any part of a river or stream segment that:

a. Is designated as a component of the State Natural and Scenic Rivers System by G.S. 113A-35.1 or G.S. 113A-35.2.

b. Is designated as a component of the national Wild and Scenic Rivers System by 16 U.S.C. § 1273 and 1274. (1967, c. 1068, s. 9; 1973, c. 1262, s. 23; 1987, c. 827, s. 154; 1993, c. 394, s. 6; c. 553, s. 80; 1995, c. 184, s. 1; c. 439, s. 1.)

§ 143-215.32. Inspection of dams.

(a) The Department may at any time inspect any dam, including a dam that is otherwise exempt from this Part, upon receipt of a written request of any affected person or agency, or upon a motion of the Environmental Management Commission. Within the limits of available funds the Department shall endeavor to provide for inspection of all dams at intervals of approximately five years.

(b) If the Department upon inspection finds that any dam is not sufficiently strong, is not maintained in good repair or operating condition, is dangerous to life or property, or does not satisfy minimum streamflow requirements, the Department shall present its findings to the Commission and the Commission may issue an order directing the owner or owners of the dam to make at his or her expense maintenance, alterations, repairs, reconstruction, change in construction or location, or removal as may be deemed necessary by the Commission within a time limited by the order, not less than 90 days from the date of issuance of each order, except in the case of extreme danger to the safety of life or property, as provided by subsection (c) of this section.

(c) If at any time the condition of any dam becomes so dangerous to the safety of life or property, in the opinion of the Environmental Management Commission, as not to permit sufficient time for issuance of an order in the manner provided by subsection (b) of this section, the Environmental Management Commission may immediately take such measures as may be essential to provide emergency protection to life and property, including the lowering of the level of a reservoir by releasing water impounded or the destruction in whole or in part of the dam or reservoir. The Environmental Management Commission may recover the costs of such measures from the owner or owners by appropriate legal action.

(d) An order issued under this Part shall be served on the owner of the dam as provided in G.S. 1A-1, Rule 4. (1967, c. 1068, s. 10; 1973, c. 1262, s. 23; 1977, c. 878, s. 3; 1987, c. 827, s. 154; 1993, c. 394, s. 7.)

§ 143-215.33. Administrative hearing.

A person to whom a decision or a dam safety order is issued under this Part may contest the decision or order by filing a contested case petition in accordance with G.S. 150B-23. A person to whom a decision is issued must file a contested case petition within 30 days after the decision is mailed to that person. A person to whom a dam safety order is issued must file a contested case petition within 10 days after the order is served. (1967, c. 1068, s. 11; 1973, c. 1262, s. 23; 1975, c. 842, s. 4; 1977, c. 878, s. 6; 1979, c. 55, s. 2; 1987, c. 827, s. 178, 1993, c. 394, s. 8.)

§ 143-215.34. Investigations by Department; employment of consultants.

The Department shall make such investigations and assemble such data as it deems necessary for a proper review and study of the design and construction of dams, reservoirs and appurtenances, and for such purposes may enter upon private property. The Department may employ or make such agreements with geologists, engineers, or other expert consultants and such assistants as it deems necessary to carry out the provisions of this Part. (1967, c. 1068, s. 12; 1973, c. 1262, s. 23; 1987, c. 827, s. 179.)

§ 143-215.35. Liability for damages.

No action shall be brought against the State of North Carolina, the Department, or the Commission or any agent of the Commission or any employee of the State or the Department for damages sustained through the partial or total failure of any dam or its maintenance by reason of any supervision or other action taken pursuant to or under this Part. Nothing in this Part shall relieve an owner or operator of a dam from the legal duties, obligations and liabilities arising from such ownership or operation. (1967, c. 1068, s. 13; 1973, c. 1262, s. 23; 1987, 827, s. 154.)

§ 143-215.36. Enforcement procedures.

(a) Criminal Penalties. – Any person who shall be adjudged to have violated this Article shall be guilty of a Class 3 misdemeanor and shall only be liable to a penalty of not less than one hundred dollars ($100.00) nor more than one thousand dollars ($1,000) for each violation. In addition, if any person is adjudged to have committed such violation willfully, the court may determine that each day during which such violation continued constitutes a separate violation subject to the foregoing penalty.

(b) Civil Penalties. – (1) The Secretary may assess a civil penalty of not less than one hundred dollars ($100.00) nor more than five hundred dollars ($500.00) against any person who violates any provisions of this Part, a rule implementing this Part, or an order issued under this Part.

(2) If any action or failure to act for which a penalty may be assessed under this Part is willful, the Secretary may assess a penalty not to exceed five hundred dollars ($500.00) per day for each day of violation.

(3) In determining the amount of the penalty, the Secretary shall consider the factors set out in G.S. 143B-282.1(b). The procedures set out in G.S. 143B-282.1 shall apply to civil penalty assessments that are presented to the Commission for final agency decision.

(4) The Secretary shall notify any person assessed a civil penalty of the assessment and the specific reasons therefor by registered or certified mail, or by any means authorized by G.S. 1A-1, Rule 4. Contested case petitions shall be filed in accordance with G.S. 150B-23 within 30 days of receipt of the notice of assessment.

(5) Requests for remission of civil penalties shall be filed with the Secretary. Remission requests shall not be considered unless made within 30 days of receipt of the notice of assessment. Remission requests must be accompanied by a waiver of the right to a contested case hearing pursuant to Chapter 150B and a stipulation of the facts on which the assessment was based. Consistent with the limitations in G.S. 143B-282.1(c) and G.S. 143-282.1(d), remission requests may be resolved by the Secretary and the violator. If the Secretary and the violator are unable to resolve the request, the Secretary shall deliver remission requests and his recommended action to the Committee on Civil Penalty Remissions of the Environmental Management Commission appointed pursuant to G.S. 143B-282.1(c).

(6) If any civil penalty has not been paid within 30 days after notice of assessment has been served on the violator, the Secretary shall request the Attorney General to institute a civil action in the Superior Court of any county in which the violator resides or has his or its principal place of business to recover the amount of the assessment, unless the violator contests the assessment as provided in subdivision (4) of this subsection. If any civil penalty has not been paid within 30 days after the final agency decision or court order has been served on the violator, the Secretary shall request the Attorney General to institute a civil action in the Superior Court of any county in which the violator resides or has his or its principal place of business to recover the amount of the assessment. A civil action shall be filed within three years of the date the final agency decision was served on the violator.

(7) The Secretary may delegate his powers and duties under this section to the Director of the Division of Land Resources of the Department.

(8) The clear proceeds of civil penalties assessed pursuant to this subsection shall be remitted to the Civil Penalty and Forfeiture Fund in accordance with G.S. 115C-457.2.

(c) Injunctive Relief. – Upon violation of any of the provisions of this Part, a rule implementing this Part, or an order issued under this Part, the Secretary may, either before or after the institution of proceedings for the collection of the penalty imposed by this Part for such violations, request the Attorney General to institute a civil action in the superior court of the county or counties where the violation occurred in the name of the State upon the relation of the Department for injunctive relief to restrain the violation or require corrective action, and for such other or further relief in the premises as said court shall deem proper. Neither the institution of the action nor any of the proceedings thereon shall relieve any party to such proceedings from the penalty prescribed by this Part for any violation of the same. (1967, c. 1068, s. 14; 1973, c. 1262, s. 23; 1975, c. 842, s. 3; 1977, c. 771, s. 4; 1987, c. 827, ss. 154, 180; 1989 (Reg. Sess., 1990), c. 1036, s. 5; 1991, c. 342, ss. 10, 11; 1993, c. 394, s. 9; c. 539, s. 1021; 1994, Ex. Sess., c. 24, s. 14(c); 1998-215, s. 65.)

§ 143-215.37. Rights of investigation, entry, access, and inspection.

The Commission shall have the right to direct the conduct of such investigations as it may reasonably deem necessary to carry out its duties prescribed in this Part, and the Department shall have the right to conduct such investigations, and for this purpose the employees of the Department and agents of the Commission have the right to enter at reasonable times on any property, public or private, for the purpose of investigating the condition, construction, or operation of any dam or associated equipment facility or property, and to require written statements or the filing of reports under oath, with respect to pertinent questions relating to the construction or operation of any dam: Provided, that no person shall be required to disclose any secret formula, processes or methods used in any manufacturing operation or any confidential information concerning business activities carried on by him or under his supervision. No person shall refuse entry or access to any authorized representative of the Commission or Department who requests entry for purposes of inspection, and who presents appropriate credentials, nor shall any person obstruct, hamper or interfere with any such representative while in the process of carrying out his official duties. (1967, c. 1068, s. 15; 1973, c. 1262, s. 23.)

North Carolina Administrative Code - Title 15A, Department of Environment and Natural Resources, Subchapter 2K - Dam Safety

SECTION .0100 - GENERAL PROVISIONS

.0101 DEFINITIONS

.0102 DAM SAFETY ORDERS

History Note: Statutory Authority G.S. 143-215.25; 143-215.32; 143-215.34; Eff. January 22, 1977; Amended Eff. November 1, 1978; Repealed Eff. June 15, 1980.

.0103 PURPOSE

The rules and regulations contained in this Subchapter are intended to carry out the purposes of the Dam Safety Law of 1967, as expressed in G.S. 143-215.24 which authorizes the implementation of a dam inspection and certification program in the interest of public health, safety and welfare.

History Note: Statutory Authority G.S. 143-215.31; 143-215.34; Eff. June 15, 1980.

.0104 DEFINITIONS

As used in this Subchapter, the following terms have their stated meaning:

(1) "Applicant" means any person who has notified the department that he or she desires to construct, repair, alter, or remove a dam and requests approval by the department.

(2) "Appurtenance" means an accessory or integral subordinate structure associated with a dam, such as a spillway, conduit, walkway, valve, control gate, etc.

(3) "Articulation" means provisions for safe movement at the joint or juncture of sections of conduit.

(4) "As-built plans" means drawings, photographs, test data, and descriptions that clearly and accurately define the dam and its appurtenances after all construction is completed.

(5) "Conduit" means a natural or artificial channel or pipe through which water or other fluid is conveyed.

(6) "Critical circle" means the circle with the lowest factor of safety against mass movement in a circular arc analysis of slope stability.

(7) "Critical failure wedge" means the mass or block having the lowest factor of safety against mass movement in an analysis of slope stability along planar surfaces.

(8) "Director" means the Director of the Division of Land Resources, North Carolina Department of Natural Resources and Community Development.

(9) "Equipotential lines" means lines which represent points of equal energy level or head in a flow net.

(10) "Factor of safety" means the ratio of the forces or moments resisting mass movement to the forces or moments tending to produce mass movement.

(11) "Flow lines" means lines which represent the direction of flow in a flow net.

(12) "Flow net" means a graphical representation of flow lines and equipotential lines.

(13) "Hazard potential" means the probable damage that would occur if the structure failed, in terms of loss of human life and economic loss or environmental damage.

(14) "Maintenance plan" means written instructions prepared by the engineer that prescribe the proper servicing and repair of mechanical equipment, appurtenances, spillways, vegetative cover, and other aspects related to the safety of the dam.

(15) "Owner" means the individual or association of individuals owning the property on which the dam exists or is to be constructed, and the persons financially responsible for the construction.

(16) "Phreatic surface" means the free-water surface of a zone of seepage; it is represented by the uppermost flow line, or seepage line, in a flow net.

(17) "Qualified engineer" means a professional engineer legally qualified to practice in North Carolina pursuant to Chapter 89C of the General Statutes of North Carolina, and having appropriate specialty expertise for the particular dam engineering problem with which he is involved.

(18) "Qualified geologist" means an earth scientist experienced in applied geology with respect to the interaction of lithologies, soils, and geologic structures with dams and impoundments, who can provide professional credentials such as certification by the American Institute of Professional Geologists or registration as a geologist in the United States.

(19) "Quality control" means that combination of testing, observation, and monitoring provided during construction to confirm that requirements stated or depicted in the plans and specifications are being achieved.

(20) "Rapid drawdown" means removal of liquid from a reservoir at a rate that is significantly faster than the rate of drainage of the materials composing the portions of the reservoir exposed by the fluid removal.

(21) "Seepage" means the movement of water in a porous material and the water exiting at the visible surface of the material.

(22) "Sliding base analysis" means an analysis of the safety of a structure against lateral movement along its foundation.

(23) "Waste treatment and mine refuse dam" means a structure for impounding, restraining, storing, or disposing of liquids, slurries, or materials capable of liquification, produced from industrial, commercial, municipal, agricultural, or mining activities.

(24) "Construction" means any action, other than by natural causes, that creates a structure capable of impounding water or other liquids, or which increases the impoundment capacity of an existing structure. For the purposes of 15A NCAC 2K .0222, it shall also mean the reduction of the height or impoundment capacity of a dam when the effect of such reduction will be to exempt the dam from the North Carolina Dam Safety Law of 1967.

History Note: Filed as a Temporary Amendment Eff. November 1, 1990 For a Period of 180 Days to Expire on April 29, 1991; Statutory Authority G.S. 143-215.25; 143-215.31; Eff. June 15, 1980; Amended Eff. July 1, 1988; November 1, 1984; ARRC Objection Lodged November 14, 1990; ARRC Objection Removed December 20, 1990; Amended Eff. January 1, 1991.

.0105 CLASSIFICATION OF DAMS

(a) For the purposes of this Subchapter, dams shall be divided into three classes, which shall be known as class A (low hazard), class B (intermediate hazard), and class C (high hazard):

(1) Class A includes dams located where failure may damage uninhabited low value non-residential buildings, agricultural land, or low volume roads.

(2) Class B includes dams located where failure may damage highways or secondary railroads, cause interruption of use or service of public utilities, cause minor damage to isolated homes, or cause minor damage to commercial and industrial buildings. Damage to these structures will be considered minor only when they are located in back water areas not subjected to the direct path of the breach flood wave; and they will experience no more than 1.5 feet of flood rise due to breaching above the lowest ground elevation adjacent to the outside foundation walls or no more than 1.5 feet of flood rise due to breaching above the lowest floor elevation of the structure, the lower of the two elevations governing. All other damage potential will be considered serious.

(3) Class C includes dams located where failure will likely cause loss of life or serious damage to homes, industrial and commercial buildings, important public utilities, primary highways, or major railroads.

(b) Classifications shall be proposed by the design engineer and are subject to approval by the Director.

(c) Probable future development of the area downstream from the dam that would be affected by its failure shall be considered in determining the classification.

(d) Dams will be subject to reclassification if the Director determines that the hazard potential has changed. Non-structural provisions of adequately demonstrated effectiveness and reliability such as flood plain zoning, and early warning systems may be considered by the Director in making this determination.

(e) When dams are spaced so that the failure of an upper dam would likely fail a lower dam, the consequence of the lower dam's failure shall be a determining factor for the upper dam's hazard classification.

(f) In assigning a hazard classification where a bridge or roadway is the only damageable property below a dam, consideration shall be given to the possibility of loss of human life, indirect economic impact through loss of service, and direct cost of damage to the bridge or roadway.

History Note: Statutory Authority G.S. 143-215.31; 143-215.34; Eff. June 15, 1980.

SECTION .0200 - OBTAINING APPROVAL FOR DAM CONSTRUCTION: REPAIR OR REMOVAL

.0201 APPLICATIONS

(a) Any person(s) who proposes to construct, repair, alter or remove a dam must file with the Director a statement concerning the location of the dam, including the name of the stream and county, height, purpose, and impoundment capacity, 10 days before start of construction. If the Director determines that the proposed dam is exempt from the law, the applicant will be notified and he may then proceed with the construction.

(b) If the Director determines that the proposed dam is not exempt from the Dam Safety Law of 1967, the applicant will be so notified within 10 days of receipt of the statement described in (a) of this Rule and construction may not commence until a full and complete application has been filed and approved. This application must be filed at least 60 days before the proposed start of construction:

(1) When an application to construct a dam has been completed pursuant to Subsection (a) of this Rule, the department shall refer copies of the completed application papers to the Department of Human Resources, the Wildlife Resources Commission, the Department of Transportation, and such other state and local agencies as it deems appropriate for review and comment.

(2) Before commencing the repair, alteration, or removal of a dam, application shall be made for written approval by the department, except as otherwise provided by this Subchapter or in accordance with G.S. 143-215.27(b). The application shall state the name and address of the applicant; shall adequately detail the changes it proposes to effect; and shall be accompanied by maps, plans, and specifications setting forth such details and dimensions as the department requires. The department may waive such requirements in accordance with G.S. 143-215.27(a). The application shall give such other information concerning the dam and reservoir required by the department concerning the safety of any change as it may require, and shall state the proposed time of commencement and completion of the work. When an application has been completed, it may be referred by the department for agency review and report as provided by G.S. 143-215.26(b) in the case of original construction.

(c) The application for any dam shall include a preliminary report. (Filing of the preliminary report prior to filing the final design report, early in the site investigation and design schedule, is encouraged to assure the state's concurrence with the hazard classification, site investigation, and design concept. This is especially encouraged for class C dams.) The preliminary report shall be filed with the application and shall include the following information:

(1) a general description of the dam and appurtenances and a proposed classification as set forth in Rule .0105 of this Subchapter; The description shall include a statement of the purpose for which the dam is to be used;

(2) a description of properties located below the dam including number of homes, buildings, roads, utilities, and other property that, as determined by the engineer, would be endangered should failure of the dam occur;

(3) maps showing the location of the proposed structure that include the county, location of state roads, access to site, and outline of the reservoir; aerial photographs or USGS maps may be used;

(4) preliminary drawings or sketches that include cross-sections, plans and profiles of the dam, proposed pool levels, and types of all spillways;

(5) preliminary design criteria and basis for selection including a description of the size, ground cover conditions, and extent of development of the watershed, drainage area, spillway design storm, geology and geotechnical engineering, assumptions for the foundation and embankment materials, and type of materials to be used in the principal spillway(s).

(d) The Final Design Report. A "Certificate of Approval" to construct will not be issued until the final design report is received and approved. The preliminary report as described in (c) of this Rule and the final design report may be submitted as one document. The final design report shall include:

(1) a report of the investigation of the foundation soils or bedrock and the borrow materials, including the location of borrow areas, that are to be used to construct the dam;

(2) criteria to indicate that the dam will be stable during construction and filling and under all conditions of reservoir operations;

(3) computations indicating that the dam is safe against overtopping during occurrence of the inflow design flood and wave action; Wave action need not be considered when the design flood is based on the probable maximum precipitation (pmp);

(4) criteria, design data or references to indicate that seepage flow through the embankment, foundation, and abutments will be controlled so that no internal erosion will take place and so there will be no sloughing in the area where the seepage emerges;

(5) calculations and assumptions relative to design of the spillway(s);

(6) provision to protect the upstream slope, crest, and downstream slope of earth embankments and abutments from erosion due to wind and rain;

(7) other design data, assumptions, and analysis data pertinent to individual dams and site conditions;

(8) a proposed construction schedule;

(9) a proposed filling schedule for the reservoir;

(10) a maintenance and operation plan;

(11) the estimated design life of the dam and the reservoir;

(12) provision for maintaining minimum stream flow requirements.

(e) The Plans and Specifications. Five sets of plans and specifications must be submitted. The plans shall be a detailed engineering design that consists of drawings and specifications and that include the following as a minimum:

(1) Sheet one shall show the name of the project; name of owner; hazard classification of the dam; designated access to the project; and location with respect to highways, roads, streams, and any dam(s) that would affect or be affected by the proposed structure;

(2) Maps shall be included showing the drainage area and outline of the reservoir and the ownership of properties covered by the reservoir or flood pool;

(3) Geologic investigation, cross-section, profiles, logs of borings, location of borrow areas, drawings of principal and emergency spillways, and other additional sheets shall be included and drawn in sufficient detail to clearly indicate the extent and complexity of the work to be performed; The degree of detail required shall be determined by the applicable provisions of Rules .0204 through .0212 of this Section;

(4) The technical provisions, as may be required, to describe the method of construction and quality control for the project;

(5) Special provisions, as may be required, to describe technical provision needed to ensure that the dam is installed according to the approved plans and specifications;

(6) General provisions that specify the rights, duties, and responsibilities of the applicant, applicant's engineer and builder and the prescribed order of work.

(f) The Director, within 60 days following receipt of a completed application, shall notify the applicant, by mail, that the application is either approved or disapproved. An approved application shall conform to the requirements of Rule .0202 of this Section.

History Note: Statutory Authority G.S. 143-215.26,-27,-31; Eff. June 15, 1980.

.0202 CERTIFICATE OF APPROVAL

(a) Approval of construction, repair, alteration, or removal of a dam will be contained in a certificate called a "Certificate of Approval" to be issued by the Director. A Certificate of Approval is a letter from the Director constituting approval subject to written general stipulations and specific written stipulations deemed necessary by the Director on a case by case basis.

(b) No construction shall be performed until the certificate is issued. The Certificate of Approval period shall be valid for the construction schedule specified in the approved final design report. Construction must commence within one year after the certificate is issued.

(c) Notice by registered or certified mail shall be given to the Director at least 10 days before construction is commenced. When repairs are necessary to safeguard life and property, they may be started immediately; but the department shall be notified forthwith of the proposed repairs and of the work under way, and they shall be made to conform to its orders.

(d) If construction does not commence within one year after the certificate of approval is issued, the certificate shall expire and a new application shall be submitted. Upon written application and for good cause shown, the Director may extend the time for commencing construction.

(e) Certificates of Approval are revocable in the event that the terms of the certificate, including the written stipulations and those terms stated in G.S. 143-215.23, are violated or in the event that conditions develop during construction that are hazardous to life and property. If the certificate is revoked due to development of hazardous conditions, the Director will issue an order requiring the owner or owners of the dam to make at his or their expense maintenance, alterations, or removal as deemed necessary within a time limited by the order; provided, any dam covered by a certificate issued under this Rule is considered to be within the definition of dams in G.S. 143-215.25 and .0104 of this Subchapter.

(f) Certificates of Approval are revocable in the event that the approved construction schedule is deviated from without prior written approval of a substitute construction schedule submitted in writing. Such approval of a substitute construction schedule shall be in the form of an Addendum to the Certificate of Approval to be issued by the Director.

History Note: Statutory Authority G.S. 143-215.26,-27,-31; Eff. June 15, 1980.

.0203 PROFESSIONAL ENGINEER REQUIREMENTS

The design, preparation of the plans and specifications, inspection of the construction of or on the dam, and certification that the dam was constructed, repaired, altered, or removed according to the plans approved by the Director and that the dam or its remains are safe shall be done by a legally qualified engineer and shall bear his professional seal unless exempted under the provisions of G.S. 89C-25.

History Note: Statutory Authority G.S. 143-215.29,-31; Eff. June 15, 1980.

.0204 INVESTIGATIONS

(a) General. The applicant shall be required to complete all investigations prior to submission of the final plans and application. The scope and the degree of precision that will be required for a specific project will depend on the conditions of the site and the hazard created by the proposed structure.

(b) Foundations and Abutments. The foundation and abutments investigation shall consist of borings, test pits, and other subsurface exploration necessary to assess the soil, rock, and groundwater conditions. Geologic profiles and a geologic report prepared by a qualified geologist may be required for class B dams and shall be required for class C dams.

(c) Construction Materials. Specifications for construction materials shall establish minimum acceptance criteria so that design properties are achieved. If the use of on-site borrow materials is specified, exploration, testing, and calculations should be performed to indicate that there are sufficient quantities of material available that meet the design criteria.

(d) Surveys. Surveys shall be made with sufficient accuracy to locate the proposed construction and to define the volume of the storage in the reservoir. The downstream area shall be investigated in order to delineate the area of potential damage in case of failure. Locations of centerlines, and other horizontal and vertical control points, shall be shown on a map of the site.

(e) Hydrologic Investigation. The drainage area shall be determined. Both present and projected future land use shall be considered in determining the runoff characteristics of the drainage area. The most severe of these two conditions shall be used in the design. All hydrologic assumptions and design calculations shall be included in the report.

History Note: Statutory Authority G.S. 143-215.26,-27,-31; Eff. June 15, 1980.

.0205 SPILLWAY DESIGN

(a) All dams shall have a spillway system with capacity to pass a flow resulting from a design storm indicated in (e) of this Rule for a hazard classification appropriate for the dam, unless the applicant provides calculations, designs, and plans to show that the design flow can be stored, passed through, or passed over the dam without failure occurring.

(b) A vegetated earth or unlined emergency spillway will be approved when computations indicate that it will pass the design storm without jeopardizing the safety of the structure. The risk of recurring storms, excessive erosion, and inadequate vegetative cover will be considered acceptable in such a spillway when its average frequency of use is predicted to be no more frequent than once in 25 years for existing class B and for class A dams except for small class A dams designed in accordance with all design criteria established by the U.S.D.A, Soil Conservation Service, and as contained in Engineering Standard 378 of the U.S.D.A., Soil Conservation Service; once in 50 years for new class B, small and medium new class C, and existing class C dams; and once in 100 years for large and very large new class C dams. The dam sizes referred to in this Subsection are defined in (e) of this Rule.

(c) Lined Spillways and Channels. The design report shall include design data criteria for open channel, drop, ogee, and chute spillways and other spillway types that include crest structures, walls, channel lining, and miscellaneous details. All masonry or concrete structures shall have joints that are relatively water-tight and shall be placed on foundations capable of sustaining applied loads without undue deformation. Provisions must be made for handling leakage from the channel or underseepage from the foundation which might cause saturation of underlying materials or uplift against the undersurfaces.

(d) Within 15 days following passage of the design storm peak, the spillway system shall be capable of removing from the reservoir at least 80 percent of the water temporarily detained in the reservoir above the elevation of the primary spillway.

(e) It is recognized that the relationships between valley slope and width, total reservoir storage, drainage area, other hydrologic factors, and specific cultural features have a critical bearing on determining the safe spillway design flood. Rational selection of a safe spillway design flood for specific site conditions based on quantitative analysis is acceptable. The spillway should be sized so that the increased downstream damage resulting from overtopping failure of the dam would not be significant as compared with the damage caused by the flood in the absence of dam overtopping failure. A design storm more frequent than once in 100 years will not be acceptable for any class C dam. In lieu of quantitative analysis, the following tables shall be used as criteria for spillway design storms and permissible velocities for vegetated earth spillways:

Criteria for Spillway Design Storm[1] Size Classification

Size	**Total Storage (Ac-Ft)[1]**	**Height (Ft)[1]**
Small	less than 750	less than 35
Medium	equal to or greater than 750 and less than 7,500	equal to or greater than 35 and less than 50
Large	equal to or greater than 7,500 and less than 50,000	equal to or greater than 50 and less than 100
Very Large	equal to or greater than 50,000	equal to or greater than 100

[1] The factor for determining the largest size shall govern.

Minimum Spillway Design Storms

Hazard	**Size**	**Spillway Design Flood (SDF)**
Low (Class A)	Small	50 year
	Medium	100 year
	Large	1/3 PMP
	Very Large	1/2 PMP
Intermediate (Class B)	Small	100 year
	Medium	1/3 PMP
	Large	1/2 PMP
	Very Large	3/4 PMP
High (Class C)	Small	1/3 PMP
	Medium	1/2 PMP
	Large	3/4 PMP
	Very Large	PMP

Permissible Velocities for Vegetated Earth Spillways

Permissible velocity[2] - feet per second				
	Erosion-resistant soils		Easily erodible soils	
	Percent slope of exit channel		Percent slope of exit channel	
Vegetation	0 to 5	5 through 10	0 to 5	5 through 10
Bermuda grass Bahia grass	8	7	6	5
Tall fescue Kentucky bluegrass Reed canary	7	6	5	4
Sod-forming grass mixture	5	4	4	3
Lespedeza, sericea Weeping lovegrass Alfalfa Crabgrass	3.5	Do not use	2.5	Do not use

[2] Increase values 10 percent when the anticipated average use of the spillway is not more frequent than once in 50 years or 25 percent when the anticipated average use is not more frequent than once in 100 years.

History Note: Statutory Authority G.S. 143-215.26; 143-215.27; 143-215.31; Eff. June 15, 1980.

.0206 CONDUITS

(a) A conduit shall be provided to drain each reservoir. The conduit design shall include the computation of the minimum time required to drain the reservoir.

(b) All pipe conduits shall convey water at the design velocity without damage to the interior surface.

(c) Protection shall be provided to prohibit unsafe seepage along conduits through the dam, abutments, and foundation. The specific design for seepage protection along conduits shall be shown in the drawings and specifications.

(d) Adequate allowances shall be incorporated in the design to compensate for differential settlement and possible elongation of the pipe conduit.

(e) Trash racks shall be installed at the intake of conduits to prevent clogging the conduit.

(f) Pipe Conduit Spillway Materials

(1) Pipe conduits shall be designed to support the total external loads in addition to the total internal hydraulic pressure without leakage.

(2) Reinforced or Prestressed Concrete Pipe Conduits

(A) All conduits are to be designed and constructed to remain watertight under maximum anticipated hydraulic pressure and maximum probable joint opening, including the effects of joint rotation and extensibility.

(B) Provisions for safe movement of the barrel are to be provided at each joint in the barrel and at the junction of the barrel and riser or inlet. Cradles are to be articulated if constructed on a yielding foundation.

(C) The engineer shall submit the final design details of the proposed pipe to be used for all class A dams where the height of the dam exceeds 35 feet and all class B and C dams.

(3) Corrugated Metal Pipe Conduits

(A) Corrugated metal pipe shall not be used in class A dams over 35 feet high or in class B and C dams, except for special cases when the design engineer can adequately demonstrate satisfactory performance.

(B) Corrugated metal pipe may be used in class A dams which are less than 35 feet high.

(C) Corrugated metal conduits shall have watertight connecting bands designed and installed to remain watertight under maximum anticipated hydrostatic head and joint rotation.

(D) Flange type couplings shall not be used for corrugated metal pipe or corrugated steel pipe where the diameter exceeds 12 inches unless the applicant produces computations to verify that the flanges and the pipe conduit are of such design to safely support the total external loads in addition to the total internal hydraulic pressure without leakage.

(g) Dissipating Devices. All gates, valves, conduits and concrete channel outlets shall be provided with a dissipator designed and constructed to control erosion and prevent damage to the embankment or the downstream outlet or channel.

(h) In the case of repair to an existing dam, the engineer may determine that the conduit should not be repaired or replaced and shall submit reasoning to support this determination in the application for the Certificate of Approval to repair. The Director shall approve, disapprove, or approve in part this determination.

History Note: Statutory Authority G.S. 143-215.26; 143-215.27; 143-215.31; Eff. June 15, 1980.

.0207 SEEPAGE CONTROL

(a) All dams shall be designed and constructed to prevent the development of instability due to excessive seepage forces, uplift forces, or loss of materials in the embankment, abutments, spillway areas, or foundation. Seepage analysis for design shall identify areas having high internal uplift or exit gradients.

(b) The design may include an embankment internal drainage system, a zoned embankment, a foundation cut-off, an upstream blanket, a sufficiently wide homogeneous section, or other methods to protect against instability from excessive seepage forces or high hydraulic gradients.

(c) For class C dams, a flow net analysis shall be made to determine the location of the phreatic surface, flow lines, and equipotential lines within the embankment and its foundation. This analysis may be based on graphical construction, electrical or liquid analogs, soil prototype methods, or other accepted methods. The flow net and stability analysis shall use the maximum operating pool level with not less than five feet of clear water at the surface. Possible fluctuations in tail water elevation shall be included in the analysis. The flow net and seepage analysis shall be documented in the final design report, as required by .0201(d)(4) of this Section.

(d) Piezometers for confirming the location of the phreatic surface assumed for seepage and slope stability analyses should be considered by the design engineer for class A and class B dams and shall be required for class C dams. Where piezometers are required, their design, depths, and locations shall be provided as required in .0201(d) and .0212(b) of this Section.

History Note: Statutory Authority G.S. 143-215.26; 143-215.27; 143-215.31; Eff. June 15, 1980.

.0208 STRUCTURAL STABILITY AND SLOPE PROTECTION

(a) Design and construction of dams to assure structural stability shall be consistent with modern engineering practice. The scope and degree of precision that will be required for a specific project will depend on the conditions of the site and the damage potential of the proposed structure. Consideration in design for structural stability shall include, but are not necessarily limited to, the following:

(1) the hazard potential of the dam under present downstream conditions and under conditions which would likely develop during the life of the reservoir;

(2) foundation bearing capacity, compressibility, and permeability; the extent and reliability of the site investigation; and the predictability of the site and foundation conditions;

(3) the reliability of construction materials, such as borrow soils, in terms of sufficient volume to complete construction without unanticipated interruption and in terms of predictability of physical properties such as strength, permeability, and compressibility;

(4) durability of construction materials;

(5) construction conditions at the site;

(6) the degree of quality control to be exercised during construction;

(7) pore pressure build-up during construction;

(8) the rate of filling the reservoir and the rate of possible reservoir drawdown;

(9) tailwater conditions and the impact of tailwater drawdown;

(10) possible effects of landslides and subsurface solution activity on the structural stability of the dam and spillway structures;

(11) the extent of piezometers and other devices which will be used to monitor the completed dam and the degree of access for inspections.

(b) Slope stability analyses should be considered by the design engineer for all embankment dams and may be required for class B and class C dams. Where slope stability analyses are required, documentation in the final design report shall include the design cross section(s) showing the soil parameters assumed for analysis, the location of the phreatic surface assumed for analysis, stability computations, and the location and computed safety factor(s) for the most critical circle(s) or failure wedge(s). A minimum factor of safety of 1.5 for slope stability for normal loading conditions, and 1.25 for quick drawdown conditions and for construction conditions, shall be required unless the design engineer provides a thoroughly documented basis for using other safety factors.

(c) Foundation bearing capacity and sliding base analyses should be considered for all dams and may be required for class B and C dams. Where bearing capacity or sliding base analyses are required, documentation of assumptions, computations, and safety factors shall be included in the final design report. A minimum factor of safety against bearing capacity and sliding wedge failure of 2.0 shall be required unless the design engineer provides a thoroughly documented basis for using other safety factors.

(d) Resistance of appurtenant structures against flotation uplift shall be provided for all dams. If the structures are anchored by dead weight alone, the buoyant weight shall be used for analysis and the minimum factor of safety shall be 1.15. If the structures are anchored to soil or rock, the minimum factor of safety for that portion of the resistance provided by soil or rock anchorage shall be 2.0 unless the design engineer provides a thoroughly documented basis for using a lower safety factor.

(e) For concrete, masonry, or other similar dams of relatively narrow cross section, resistance against overturning under maximum design loading conditions shall be considered; overturning stability computations shall be required for class B and class C dams. Where overturning analyses are required, the computations shall be included in the final design report. The minimum safety factor against overturning under maximum design loading conditions shall be 1.5 unless the design engineer provides a thoroughly documented basis for using a lower safety factor.

(f) The anticipated reservoir and tailwater drawdown conditions shall be considered in all stability computations and shall be included in the design documents provided in the final design report.

(g) The slopes must be protected against erosion by wave action, and the crest and downstream slope must be protected against erosion due to wind and rain. Riprap and other erosion protection shall be provided over the full range in stage between the lowest drawdown elevation and at least two feet above full normal pool. Exceptions for slowly rising reservoirs, such as waste storage facilities, may be approved in writing by the Director.

History Note: Statutory Authority G.S. 143-215.26; 143-215.27; 143-215.31; Eff. June 15, 1980.

.0209 DESIGN LIFE OF A DAM AND RESERVOIR

(a) The selection of materials and equipment to be used in a dam and all of its appurtenant features shall either be based on sufficient quality and durability to satisfactorily function throughout the design life or shall provide for safe and economical replacement within the design life span.

(b) The design life of a dam and reservoir is the period of time the dam and reservoir can be expected to perform effectively as planned. The design life of a dam shall be determined by the following:

(1) the time required to fill the reservoir with sediment from the contributing watershed,

(2) the durability of appurtenances and materials used to construct the dam,

(3) the time required to permanently fill a waste treatment or storage facility with waste,

(4) the time required to perform the specific function for which the dam was designed.

History Note: Statutory Authority G.S. 143-215.27; 143-215.31; Eff. June 15, 1980.

.0210 SEDIMENT CONTROL

Sediment control related to earth moving activities involved in construction or repair of dams shall be provided in accordance with the North Carolina Sediment Pollution Control Act of 1973 (G.S. 113A-50 through 113A-66). Devices for sediment control during drainage of a reservoir shall be provided; exceptions for emergency drainage of a reservoir may be approved by the Director.

History Note: Statutory Authority G.S. 143-215.31, -113A-54; Eff. June 15, 1980.

.0211 WASTE TREATMENT AND MINE REFUSE DAMS

(a) Waste treatment and mine refuse dams and reservoirs shall conform to all requirements of this Subchapter. In addition to the requirements of Rule .0105 of this Subchapter, a waste treatment or mine refuse dam may be classified A, B, or C on the basis of potential environmental damage.

(b) Mine refuse dams that are designed to be constructed in stages shall include an emergency spillway system that is capable of safely passing the required storm frequency below the top of the dam for each stage of construction. The refuse facility shall not be used until each stage of construction is completed and approved by the Director.

History Note: Statutory Authority G.S. 143-215.31; Eff. June 15, 1980.

.0212 ADDITIONAL DESIGN REQUIREMENTS

(a) All elements of the dam and reservoir shall conform to good engineering practice. The safety factors, design standards, and design references that are used shall be included with the final design report.

(b) Monitoring or inspection devices may be required by the Director for use by inspectors or owners in the inspection during construction and filling and after completion of construction. The Director may also require that such monitoring or inspection devices, existing or installed by requirement, be read and documented at specified intervals and that copies of such be forwarded to his office.

(c) The plans, construction schedule, and construction specification shall assure that the downstream flow satisfies minimum quality and quantity standards as defined in G.S. 143-215.25(4) during the period of construction, filling, and life of the dam and reservoir.

History Note: Statutory Authority G.S. 143-215.26; 143-215.27; 143-215.31; Eff. June 15, 1980.

.0213 CONSTRUCTION SCHEDULE

The applicant shall submit a construction schedule that includes:

(1) Techniques and work force to be used to insure that the dam is constructed according to the plans and specifications;

(2) A construction schedule that includes the estimated time to complete the construction activities;

(3) Techniques to be used to divert the stream flow to prevent interference with construction and hazard to life, health, or property;

(4) The extent and method of quality control shall be subject to approval of the Director.

History Note: Statutory Authority G.S. 143-215.26; 143-215.27; 143-215.31; Eff. June 15, 1980.

.0214 PROPOSED CHANGES IN DESIGN

The owner shall notify the director of any proposed changes in design, plans, and specifications that will affect the stability of the dam. Approval must be obtained from the Director prior to installation. This approval shall be in the form of a written addendum to the Certificate of Approval.

History Note: Statutory Authority G.S. 143-215.26; 143-215.27; 143-215.31; Eff. June 15, 1980.

.0215 AS-BUILT PLANS

Two complete sets of as-built plans shall be submitted to the Director within 30 days of completion of the project.

History Note: Statutory Authority G.S. 143-215.30; 143-215.31; Eff. June 15, 1980.

.0216 ENGINEER'S CERTIFICATION

The engineer who has inspected the construction of or on the dam shall submit written certification bearing his professional seal, unless exempted under the provisions of G.S. 89C-25, that the dam and all appurtenances have been built, repaired, altered, or removed in conformance with the plans, specifications, and drawings approved by the Director and that the dam is safe.

History Note: Statutory Authority G.S. 143-215.30; 143-215.31; Eff. June 15, 1980.

.0217 AUTHORITY FOR INSPECTION

Authorized personnel of the department may make inspection during construction as deemed necessary to ensure that the structure is being built in conformance with the Certificate of Approval issued. Said inspections do not relieve the engineer in charge from the responsibility of providing adequate inspection of the work.

History Note: Statutory Authority G.S. 143-215.29; 143-215.30; 143-215.31; Eff. June 15, 1980.

.0218 EXEMPTIONS

History Note: Statutory Authority G.S. 143-215.21; 143-215.31; Eff. June 15, 1980; Amended Eff. November 1, 1985; Repealed Eff. July 1, 1988.

.0219 ACCEPTABLE DESIGN: PROCEDURES AND TECHNICAL REFERENCES

The following represent acceptable design procedures and references:

(1) the design procedures, manuals, and criteria used by the United States Corps of Engineers;

(2) the procedures, manuals, and criteria used by the United States Soil Conservation Service;

(3) the procedures, manuals, and criteria used by the United States Department of Interior, Bureau of Reclamation;

(4) other procedures that are approved by the Director.

History Note: Statutory Authority G.S. 143-215.31; 143-215.34; Eff. June 15, 1980.

.0220 GRANTING OF FINAL APPROVAL

(a) Unless the Director has reason to believe that the dam, as completed, is unsafe or not in compliance with any applicable requirement, regulation, or law, the Director, upon completion of construction and upon receipt of the engineer's certification pursuant to Rule .0215 of this Section, shall grant final approval of the work in accordance with the certificate, subject to such terms as he/she deems necessary for the protection of life and property.

(b) Pending issuance of final approval, a new dam or the addition to an existing dam shall not be used except on written consent of the Director and subject to conditions he/she may impose relating to safety of life and property and the satisfaction of minimum stream flow requirements.

History Note: Statutory Authority G.S. 143-215.3; 143-215.30; Eff. June 15, 1980.

.0221 DELEGATION OF AUTHORITY

The Director has the authority to:

(1) issue approval, disapproval, or approval subject to conditions for proposed construction, repair, alteration or removal of dams;

(2) require progress reports, issue notices of non-compliance and orders to comply, order a halt in construction in the event of non-compliance;

(3) receive notices of completion, specify details of description, grant final approval;

(4) assess civil penalties; and

(5) perform other related functions.

History Note: Statutory Authority G.S. 143-215.3; 143-215.3(a)(4); 143-215.28; 143-215.29; 143-215.30; 143-215.36(b); Eff. June 15, 1980; Amended Eff. November 1, 1982.

.0222 APPLICATION PROCESSING FEES

(a) A nonrefundable minimum application processing fee, in the amount stated in Paragraph (d)(1) of this Rule, shall be paid when an application for construction or removal of a dam is filed in accordance with 15A NCAC 2K .0201. Each application for construction or removal of a dam shall be deemed incomplete and shall not be reviewed until the minimum application processing fee is paid.

(b) A nonrefundable additional application processing fee, in the amount stated in Paragraph (d)(2) of this Rule, shall be paid when the as-built plans are submitted to the Director in accordance with 15A NCAC 2K .0215. Final approval to impound, pursuant to 15A NCAC 2K .0220, shall not be granted until the owner's certification and the accompanying documentation are filed in accordance with Paragraph (e) of this Rule, and the additional processing fee is paid.

(c) The application processing fee for the construction or removal of a dam shall be based on the actual cost of construction or removal of the applicable dam.

(1) The actual cost of construction or removal of a dam shall include all labor and materials costs associated with the construction or removal of the dam and appurtenances.

(2) The actual cost of construction or removal of a dam shall not include the costs associated with acquisition of land or right of way, design, quality control, electrical generating machinery, or constructing a roadway across the dam.

(d) Schedule of Fees:

(1) The minimum application processing fee shall be two hundred dollars ($200.00).

(2) The additional application processing fee shall be the following percentages of the cost of construction or removal:

(A) 2 percent of the actual costs between ten thousand and one dollars ($10,001) and one hundred thousand dollars ($100,000);

(B) 1.5 percent of the actual costs between one hundred thousand and one dollars ($100,001) and five hundred thousand dollars ($500,000);

(C) 1.0 percent of the actual costs between five hundred thousand and one dollars ($500,001) and one million dollars ($1,000,000);

(D) 0.5 percent of the actual costs over one million dollars ($1,000,000). In no case, however, shall the additional application fee be more than fifty thousand dollars ($50,000).

(e) Immediately upon completion of construction or removal of a dam, the owner shall file with the Director a certification, on a form prescribed by the Department, and accompanying documentation, which shows the actual cost incurred by the owner for construction or removal of the applicable dam.

(1) The owner's certification and accompanying documentation shall be filed with the as-built plans and the engineer's certification in accordance with 15A NCAC 2K .0215 and 15A NCAC 2K .0216, respectively.

(2) If the Director finds that the owner's certification and accompanying documentation contain inaccurate cost information, the Director shall either withhold final impoundment approval, or revoke final impoundment approval, until the owner provides the accurate documentation and that documentation has been verified by the Department.

(f) Payment of the dam application processing fee shall be by check or money order made payable to the "N.C. Department of Environment, Health, and Natural Resources". The payment should refer to the applicable dam.

(g) In order to comply with the limit on fees set forth in G.S. 143-215.28A, the Director shall, in the first half of each state fiscal year, project revenues for the fiscal year from fees collected pursuant to this Rule. If this projection shows that the statutory limit will be exceeded, the Director shall order a pro rata reduction in the fee schedule for the remainder of the fiscal year to avoid revenue collection in excess of the statutory limits.

History Note: Filed as a Temporary Rule Eff. November 1, 1990 For a Period of 180 Days to Expire on April 29, 1991; Statutory Authority G.S. 143-215.28A; ARRC Objection Lodged November 14, 1990; ARRC Objection Removed December 20, 1990; Eff. January 1, 1991.

.0223 DAM HEIGHT AND STORAGE DETERMINATION

(a) For the purpose of determining size classification, the height of a dam shall be measured from the highest point on the crest of the dam to the lowest point on the downstream toe.

(b) The total storage capacity of a dam shall be that volume which would be impounded at the elevation of the highest point on the crest of the dam.

History Note: Filed as a Temporary Rule Eff. November 1, 1990 For a Period of 180 Days to Expire on April 29, 1990; Statutory Authority G.S. 143-215.31; ARRC Objection Lodged November 14, 1990; ARRC Objection Removed December 20, 1990; Eff. January 1, 1991.

SECTION .0300 - INSPECTIONS: DAM SAFETY ORDERS

.0301 INSPECTION BY THE DEPARTMENT

(a) Schedule of Inspections

(1) All class A and B dams shall be inspected at least once every five years.

(2) Class C dams shall be inspected at least once every two years.

(b) At any time an inspection indicates that a dam may not perform satisfactorily or that the hazard classification has changed, the Director may require a detailed investigation at the owner’s expense to determine the required remedial action, if any.

History Note: Statutory Authority G.S. 143-215.31; 143-215.32; Eff. June 15, 1980.

.0302 DAM SAFETY ORDERS

(a) The Director may issue an order directing the owner(s) of a dam to make, in not less than 90 days from issuance of the order and at the owner(s) expense, any maintenance, alteration, repairs, reconstruction, or change in construction upon a finding that the dam:

(1) is not sufficiently strong,

(2) is not maintained in good repair or operating condition,

(3) is dangerous to life or property, or

(4) does not satisfy minimum stream-flow requirements.

(b) The Director may issue an order directing the owner(s) of any dam to take such measures as may be essential, including lowering the level of the impounded water, drainage of the impoundment, and destruction of the dam or reservoir in whole or in part, immediately or within a time limited by the order if the condition of the dam is found to have become so dangerous to the safety of life or property, in the opinion of the Director, as not to safely permit sufficient time for issuance of an order in the manner provided by Subdivision (a) of this Rule.

(c) The Director may, if at any time the condition of any dam becomes so dangerous to the safety of life or property, in the opinion of the Director, as not to permit sufficient time for issuance of an order in the manner provided by Subdivision (a) or (b) of this Rule, immediately take such measures as may be essential to provide emergency protection to life and property including the lowering of the level of a reservoir by releasing water impounded or the destruction in whole or in part of the dam or reservoir. Costs of such measures may be recovered from the owner(s) of the dam by appropriate legal action by the Commission.

(d) Orders issued by the Director may be conditioned so as to require the dam owner, if he is required or given the option to remove the dam, to undertake the removal in such a manner as to minimize the amount of sediment transported from the impoundment downstream.

(e) Dam safety orders issued by the Director in no way relieve the owner(s) of the dam from duties and obligations imposed by regulations in Section .0200 of this Subchapter, nor do they relieve the owner(s) of the dam from any liabilities or other legal obligations.

History Note: Statutory Authority G.S. 143-215.32; 143-215.34; Eff. June 15, 1980.

SECTION .0400 - ADMINISTRATIVE HEARINGS

.0401 OPPORTUNITY FOR HEARING

An administrative hearing before the N.C. Office of Administrative Hearings shall be granted to any person:

(1) whose application for dam construction, repair, alteration, or removal has been disapproved by the Director or has been approved by the Director subject to conditions which are unacceptable to the applicant pursuant to Rule .0202 of this Subchapter;

(2) who has been denied final approval of a completed dam by the Director or who has been granted final approval by the Director subject to conditions which are unacceptable to the applicant pursuant to Rule .0219 of this Subchapter;

(3) against whom a dam safety order has been issued requiring the maintenance, alteration, repair, reconstruction, change in construction or location, or removal of a dam within 90 days, pursuant to Rule .0302(a) of this Subchapter, or the lowering of the level of the water impounded by the dam within a time period prescribed by the Director pursuant to Rule .0302(b) of this Subchapter; or

(4) who has been assessed a civil penalty pursuant to G.S. 143-215.36(b) and Subchapter 2J of this Chapter.

History Note: Statutory Authority G.S. 143-215.33; 150B-23; Eff. June 15, 1980; Amended Eff. July 1, 1988.

.0402 PROCEDURES

(a) Administrative hearings shall be conducted pursuant to 15A NCAC 1B .0200 et seq., and Chapter 150B of the General Statutes. Any person entitled to an opportunity for a hearing by Rule .0401 of this Section must request a hearing within ten days after receipt of the notice of the action taken under Rule .0401 of this Section.

(b) Copies of 15A NCAC 1B .0200 may be inspected in the offices of the Division of Land Resources, Land Quality Section, 512 N. Salisbury Street, Raleigh, N. C. 27611. Copies may also be inspected in the Division of Planning and Assessment, 512 N. Salisbury Street, 8th Floor, Archdale Building, Raleigh, N. C. 27611. Copies may be obtained at the previous locations or from the Rules Division of the N.C. Office of Administrative Hearings, Blount Street, Raleigh, N.C. 27611.

History Note: Statutory Authority G.S. 143-215.33; 150B-23; Eff. June 15, 1980; Amended Eff. August 1, 1988; November 1, 1984.

.0403 DELEGATION OF AUTHORITY: APPOINTMENT OF HEARING OFFICERS

.0404 NOTICE: WAIVER

.0405 PLACE OF THE HEARING

.0406 PROCEDURES

.0407 HEARING OFFICERS: POWERS AND DUTIES

.0408 FINAL DECISIONS: JUDICIAL REVIEW

History Note: Statutory Authority G.S. 143-215.3(a)(4); 143-215.33; 150B-23; 150B, Article 3; 150B, Article 4; Eff. June 15, 1980; Legislative Objection (c) Lodged Eff. October 10, 1980; Amended Eff. November 1, 1982; Repealed Eff. November 1, 1984.

SECTION .0500 - MINIMUM STREAM FLOWS TO MAINTAIN AQUATIC HABITAT

.0501 DEFINITIONS

(a) Aquatic habitat shall be divided into three classes - "poor," "moderate," and "good."

(1) Streams with poor aquatic habitat are those which have a "poor" fish assemblage rating, and which are rated "poor" for at least two of the following three characteristics:

(A) Substrate;

(B) Cover; and

(C) Macro-invertebrate organisms.

(2) Streams with moderate aquatic habitat are those which exhibit physical conditions and biota which are intermediate between the poor and good categories.

(3) Streams with good aquatic habitat are those which receive at least two "good" ratings when the substrate, cover, and macro-invertebrate organism characteristics are evaluated. The fish assemblage also must receive a "good" rating.

(b) Cover means objects within or overhanging the stream channel which provide shelter for aquatic organisms. "Good" cover occurs when cover is widespread and diverse. "Poor" cover occurs when the amount of cover is small or non-existent.

(c) Substrate means the predominant particle size of the material which makes up the stream bed. "Good" substrate is composed of at least 50 percent silt free substrate with gravel or cobble. "Poor" substrate is composed of at least 80 percent silt, sand, or smooth bedrock.

(d) The macro-invertebrate organisms of the affected reach are rated as "good" if the affected reach is rated good or excellent in the Division of Environmental Management's (DEM) biological monitoring database, or by a site-specific survey according to Standard Operating Procedures for Biological Monitoring, 1995, Division of Environmental Management as defined in 15A NCAC 2B .0103(b). Macro-invertebrates are rated "poor" if the reach is rated fair or poor in DEM's biological monitoring database, or by a site-specific survey according to Standard Operating Procedures for Biological Monitoring, 1995, Division of Environmental Management as defined in 15A NCAC 2B .0103(b).

(e) The fish assemblage rating shall be based on the North Carolina Index of Biotic Integrity (IBI). Existing ratings from the DEM biological monitoring database shall be used where available. If no rating exists, then a site-specific survey shall be conducted according to Standard Operating Procedures for Biological Monitoring, 1995, Division of Environmental Management as defined in 15A NCAC 2B .0103(b). The fish assemblage shall be rated as "good" if the IBI rating is good, good-excellent, or excellent. The fish assemblage shall be rated as "poor" if the IBI rating is poor or lower.

(f) The affected reach of stream means that section of a stream downstream of a dam which experiences significant changes in hydrology. The exact delineation of the affected reach shall be site-specific and depend on factors including, but not limited to:

(1) volume of storage in the impoundment;

(2) upstream and downstream hydrologic characteristics of the stream;

(3) withdrawals from the impoundment; and

(4) downstream point source discharges to the stream.

For the purpose of evaluating aquatic habitat, the affected reach of a stream does not include any portion which is in the backwater of a downstream dam when the level of that downstream impoundment is at normal pool.

(g) "Special case" streams are those which exhibit at least one of the following characteristics:

(1) supplemental classification as an Outstanding Resource Water as defined in 15A NCAC 2B .0101(e)(4) and .0216;

(2) populations of aquatic species listed as threatened or endangered by the U.S. Fish and Wildlife Service, or species which are listed as threatened or endangered by the N.C. Wildlife Resources Commission;

(3) self-sustaining populations of wild trout; or

(4) exceptional non-game or fishery resources as determined by the Wildlife Resources Commission.

(h) The use of the regression equations in Rule .0502 of this Section shall depend on the geographic region of the state in which the stream is located. The geographic region shall be determined from the North Carolina Atlas, edited by Clay, Orr, and Stuart, published by the University of North Carolina Press, 1975.

(i) A continuous stream gage record means a continuous record of daily flows from a stream gage which:

(1) has at least 15 years of continuous daily records;

(2) has no significant hydrological effects caused by upstream regulation, withdrawals, or discharges;

(3) is no less than one-half and no more than one and one-half times the drainage area of the site in question; and

(4) has low flow and average flow yields which are comparable to the site in question.

(j) A site-specific instream flow study conducted by the applicant or his consultants, which is subject to approval by the Department, means a study performed according to the following conditions:

(1) A plan of study shall be developed in consultation with the Department and submitted to the Department for review and approval prior to commencement of the study.

(2) The plan of study shall identify the aquatic habitat parameters to be evaluated by the study. The selection of these parameters shall depend on factors including, but not limited to:

(A) the aquatic species being evaluated;

(B) the habitat quality of the affected reach; and

(C) existing or potential water shortages or water use conflicts.

(3) The Department shall have the option of participating in the collection of all field data, and shall be notified prior to collection of any set of data.

(4) The results of the study shall accurately determine the parameters identified during study design.

(5) The Department may review the field data and results of these studies to determine the stream flow needed to maintain aquatic habitat.

History Note: Statutory Authority G.S. 143-215.24; 143-215.25; 143-215.31; 143-215.32; 143-215.33; 143-215.36; Eff. December 1, 1994; Amended Eff. April 1, 1995.

.0502 REQUIRED MINIMUM FLOW FOR DAMS (NOT SMALL HYDRO PROJECTS)

(a) A dam operated by a small power producer, as defined in G.S. 62-3(27a), that diverts water from 4,000 feet or less of the natural stream bed, shall be exempt from this Rule.

(b) A dam proposed for a small stream with a mean annual daily flow less than or equal to 3.0 cubic feet per second (cfs) shall be subject to the following review process in determining the required minimum flow:

(1) If the mean annual daily flow is less than or equal to 3.0 cfs and the 7-day, 10-year low flow (7Q10) is less than or equal to 0.2 cfs; and if there are no existing point source discharges of wastewater to the affected stream reach; then no minimum release will be required.

(2) If the mean annual daily flow is less than or equal to 3.0 cfs and the 7Q10 is less than or equal to 0.2 cfs; and one or more existing point source discharges of wastewater enter the affected stream reach; then the minimum release shall be equal to the 7Q10.

(3) If the mean annual daily flow is less than or equal to 3.0 cfs and the 7Q10 is greater than 0.2 cfs, then the minimum release shall be equal to the 7Q10.

(c) If the mean annual daily flow is greater than 3.0 cfs, then the following procedures shall be used to determine the minimum flow requirement:

(1) The minimum flow for a dam on a stream with poor aquatic habitat shall be the 7Q10 flow determined by using U.S. Geological Survey procedures.

(2) The minimum flow for a dam on a stream with moderate aquatic habitat in the piedmont, as defined in Rule .0501(h) of this Section, shall be determined using regression equations provided in this Subparagraph.

(A) All flows used in regression equations shall be measured in cubic feet per second, all drainage areas shall be measured in square miles, and all logarithmic expressions shall refer to base 10 logarithms.

(B) The regression equation used to determine the minimum flow for a stream in the piedmont which exhibits moderate aquatic habitat, and for which no continuous stream gage record, as defined in Rule .0501(i) of this Section, exists, shall be as follows:

LRF = (3.204 x M) - (2.618 x D)
LRF = LOG of regression flow
M = LOG of mean annual daily flow
D = LOG of drainage area

The regression flow (RF) is calculated by raising 10 to the power of the LRF. If the drainage area is greater than 95 square miles, the required minimum flow is 1.4 x RF. Otherwise the required minimum flow is equal to RF.

(C) The regression equation used to determine the minimum flow for a stream in the piedmont which exhibits moderate aquatic habitat, and for which a continuous stream gage record, as defined in Rule .0501(i) of this Section, does exist, shall be as follows:

LRF = (0.812 x M) + (8.111 x E92) - (4.806 x E85) - (3.275 x E95)
LRF = LOG of regression flow
M = LOG of mean annual daily flow
E85 = LOG of 85% annual exceedance flow
E92 = LOG of 92.5% annual exceedance flow
E95 = LOG of 95% annual exceedance flow

The regression flow (RF) is calculated by raising 10 to the power of the LRF. The required minimum flow is 1.1 x RF.

(3) The minimum flow for a dam on a stream with moderate aquatic habitat, located in a geographical region for which regression formulas are not provided, shall be determined by a site-specific instream flow study, as defined in Rule .0501(j) of this Section, conducted by the applicant or his consultants and subject to the approval of the Department.

(4) The minimum flow for a dam on a special case stream, or on a stream with good aquatic habitat, shall be determined by a site-specific instream flow study, as defined in Rule .0501(j). This study shall be conducted by the applicant or his consultants, and shall be subject to approval by the Department.

(5) If the applicant or owner disputes the minimum flow determined by the procedures described in Subparagraphs (c)(1) or (c)(2) of this Rule for streams with poor or moderate aquatic habitat, he may undertake a site-specific field study, as defined in Rule .0501(j) of this Section, subject to the review and approval of the Department. The final minimum release required will not exceed the amount determined by the procedures described in this Rule.

(6) The minimum release schedule for a water supply reservoir shall include provisions for reductions in the minimum flow which coincide with reductions in the usable water supply storage remaining in the impoundment and with reductions in the amount of water withdrawn from the reservoir.

(A) This system of tiered releases shall apply to new water supply reservoirs and any existing water supply reservoirs for which the minimum release is revised.

(B) The exact percentage of storage which triggers reductions in minimum flow will depend on several site-specific factors, including, but not limited to:

(i) size of the reservoir;

(ii) rate of the water supply demand;

(iii) hydrologic characteristics of the impounded stream; and

(iv) the impoundment levels which result in local efforts to reduce water usage through conservation measures.

(C) At least three levels of minimum releases shall be included in the release schedule for a water supply reservoir.

(D) When usable water supply storage has been reduced to a level which triggers the first reduction in minimum flow, then the average daily water withdrawal shall be reduced by at least 10 percent from the average daily withdrawal for the 60 day period immediately prior to the first reduction in the minimum flow. The water supply operator shall accomplish this reduction in withdrawal within two weeks of the reduction in the minimum release.

(E) When usable water supply storage has been reduced to a level which triggers the second reduction in minimum flow, then the average daily water withdrawal shall be reduced by at least 20 percent from the average daily withdrawal for the 60 day period immediately prior to the first reduction in the minimum flow. The water supply operator shall accomplish this further reduction in withdrawal within two weeks of the second reduction in the minimum release.

(F) The water system operator shall document reduction in water withdrawals by submitting reports of daily water withdrawals to the Department. These shall be submitted every two weeks for as long as the minimum release is reduced below the amount normally required.

(G) An example is shown in the table below. (Note that the percentages of water supply storage which trigger the changes in minimum release are site-specific for this example and may vary according to the factors described in Part (B) of this Paragraph.)

Remaining Usable Water Level Supply Storage	Minimum Release	Water Use Reduction
between 70% and 100%	A	-------
between 40% and 70%	B	10%
below 40%	C	20%

A = Normal minimum release determined by a field study, regression equation, or use of the 7Q10

B = Intermediate reduction in minimum release

C = Low minimum release equal to no more than the 7Q10

(7) An existing dam which was built subject to review under the National or the State Environmental Policy Acts, and for which a minimum release has been established, will not have its minimum release changed under this Rule. However, the Department may review and adjust the minimum flow released by any other existing dam if there is evidence of any of the following conditions downstream of that dam:

(A) water quality standards not being maintained;

(B) water quality classifications which are being only partially supported or not being supported; or

(C) aquatic habitat not being maintained.

(8) If the minimum release required from an existing water supply reservoir is reviewed by the Department, any increase in minimum flow will be determined on a case-by-case basis in consideration of the following factors, including, but not limited to:

(A) availability of water to meet existing demands;

(B) rate of growth in water demand;

(C) planned development of alternative sources of water supply;

(D) structural difficulties;

(E) capital costs; and

(F) anticipated improvements in water quality and aquatic habitat in the affected reach resulting from the proposed change in minimum flow.

The change in minimum release shall be set no higher than an amount which would reduce the water supply safe yield, as determined by standard accepted engineering practices, by more than 10 percent.

(9) If a new minimum release requirement from an existing water supply reservoir is being delayed until a new source of water supply is developed, then this delay shall not exceed a period of five years from the written notification that a new minimum release will be required. This period may be extended by approval of the Environmental Management Commission in consideration of the following factors:

(A) delays in developing a new water supply source;

(B) changes in water quality and aquatic habitat in the affected reach; or

(C) availability of water to meet existing demands.

History Note: Statutory Authority G.S. 143-215.24; 143-215.25; 143-215.31; 143-215.32; 143-215.33; 143-215.36; Eff. December 1, 1994; Amended Eff. April 1, 1995.

.0503 REQUIRED MINIMUM FLOW FOR SMALL HYDROELECTRIC PROJECTS

(a) This Rule shall apply only to a dam operated by a small power producer, as defined in G.S. 62-3(27a), that diverts water from 4,000 feet or less of the natural stream bed. The length of the bypassed reach shall be measured from the toe of the dam to the point where the diverted water re-enters the natural channel, following the centerline of the natural channel.

(b) The minimum release for a hydroelectric project subject to this Rule shall be determined according to the procedures described in Subparagraphs (1)-(5) of this Paragraph. If at any time the inflow just upstream of the dam is less than the minimum flow required in the bypassed reach, then the minimum flow may be reduced to a level equal to this inflow.

(1) If the aquatic habitat in the bypassed reach is rated poor, then the minimum release to the bypassed reach shall be determined as follows:

(A) If the 7Q10 is less than or equal to 10 percent of the mean annual daily flow, then the minimum release to the bypassed reach shall be the 7Q10 flow.

(B) If the 7Q10 is greater than 10 percent of the mean annual daily flow, and there are no existing point source discharges of wastewater to the bypassed reach, then the minimum release to the bypassed reach shall be 0.8 times the 7Q10.

(C) If the 7Q10 is greater than 10 percent of the mean annual daily flow, and one or more existing point source discharges of wastewater enter the bypassed reach, then the minimum release to the bypassed reach shall be the 7Q10 flow.

(2) If the bypassed reach does not have an aquatic habitat rating of "poor," is not on a special case stream, and is located in the piedmont region, as defined in Rule .0501(h) of this Section, then the minimum release to the bypassed reach shall be determined as follows:

(A) If the 7Q10 is less than or equal to six percent of the mean annual daily flow, then the minimum release to the bypassed reach shall be 3.0 times the 7Q10 flow.

(B) If the 7Q10 is greater than six percent of the mean annual daily flow, and less than or equal to 10 percent of the mean annual daily flow, then the minimum release to the bypassed reach shall be 2.2 times the 7Q10 flow.

(C) If the 7Q10 is greater than 10 percent of the mean annual daily flow, then the minimum release to the bypassed reach shall be 1.2 times the 7Q10 flow.

(3) The minimum flow determined by the procedures described in Subparagraphs (1) and (2) of this Paragraph may be adjusted downward by the Department if that adjustment would not result in significant loss of aquatic habitat. This adjustment may be based on factors including:

(A) the type of aquatic habitat present in the bypassed reach;

(B) the length of the bypassed reach.

(4) If the applicant or owner disputes the minimum flow determined by the procedures described in Subparagraphs (1) and (2) of this Paragraph, he may undertake a site-specific field study, as defined in Rule .0501(j) of this Section, subject to the review and approval of the Department. The final minimum release required will not exceed the amount determined by the procedures described in this Section.

(5) The minimum flow for a dam on a special case stream, or on a stream located in the mountain region, as defined in Rule .0501(h) of this Section, which does not exhibit poor aquatic habitat; shall be determined by a site-specific in stream flow study, as defined in Rule .0501(j) of this Section. This study shall be conducted by the applicant or his consultants, and shall be subject to approval by the Department.

(c) A dam operated by a small power producer, as defined in G.S. 62-3(27a), which was operating to produce power as of October 13, 1994, and which is not under the jurisdiction of the Federal Energy Regulatory Commission, shall not be required by this Rule to increase its minimum flow above the amount required on October 13, 1994.

History Note: Statutory Authority G.S. 143-215.24; 143-215.25; 143-215.31; 143-215.32; 143-215.33; 143-215.36; Eff. December 1, 1994; Amended Eff. April 1, 1995.

.0504 MONITORING OF MINIMUM FLOW REQUIREMENTS

(a) An owner of a dam with a minimum flow requirement greater than 1.0 cfs shall install, calibrate, and maintain one or more stream staff gages following procedures described in U.S. Geological Survey Water Supply Paper 2175, "Measurement and Computation of Streamflow." Plans for such gages shall be submitted to the Department for approval prior to installation. Staff gages shall be calibrated to indicate the water surface elevations which correspond to the required flows. Calibration shall be verified at least every two years. All initial calibration and re-calibration measurements, including field data, shall be provided to the Department within 30 days of completion.

(b) If the minimum release from a dam is less than or equal to 1.0 cfs, then an accurately calibrated release mechanism such as a gate or pipe opening shall be acceptable in lieu of a staff gage. Plans for making the required release shall be submitted to the Department for review and approval prior to construction, repair, or modification of the dam.

(c) An owner of a dam who does not comply with a minimum flow requirement may be required to install automated gaging which continuously monitors flow. Records from this type of gage shall be provided to the Department upon request, for the time period being investigated.

(d) Minimum release requirements may be modified or suspended for a term determined by the Department for reasons including pre-scheduled maintenance or construction involving the dam. The Department must approve a written request for such a change in the minimum flow requirement prior to any change in the minimum release.

(e) Reduction or cessation of the minimum flow as a result of emergency conditions or equipment failure shall not constitute a violation of the minimum flow requirement, so long as the event is reported to the Department within 48 hours. The Department may set forth a schedule for correcting the problem and restoring the required minimum flow. If the schedule is not met, and the problem continues to cause violation of the minimum flow requirement, then this violation may be subject to enforcement action.

History Note: Statutory Authority G.S. 143-215.24; 143-215.25; 143-215.31; 143-215.32; 143-215.33; 143-215.36; Eff. December 1, 1994.

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

Date: November 6, 2014

NOTICE OF CHANGE IN DAM SAFETY ACT THAT MAY AFFECT YOUR DAM, REQUIRES ACTION

The Coal Ash Management Act of 2014, signed into law on September 20, 2014, **requires all owners of high and intermediate hazard dams to submit Emergency Action Plans (EAPs) to the N.C. Department of Environment and Natural Resources (DENR) and the N.C. Department of Public Safety (DPS) no later than March 1, 2015.**

We are pleased to announce the launch of a web-based EAP Development Tool for dams that will assist dam owners in complying with the new statutory requirement. The EAP Development Tool is now available for all North Carolina dam owners at https://staging.ncem.org/DamEAP/Default.aspx Please note that once you enter this site for the first time, you will be directed to create a "NCID" which will allow you secure access to the EAP Development Tool.

DPS's Division of Emergency Management (NCEM) and the Division of Energy, Mineral, and Land Resources (DEMLR) of DENR have worked in close partnership on the EAP Development Tool through which dam owners can develop EAPs by direct internet portal access using the provided template. The intent of this effort is to create an affordable, secure, statewide repository for EAPs that can be accessed by local and state emergency management personnel and dam safety program engineers for real-time access to information in the event of a dam safety emergency and to review and approve EAPs as they are submitted. The EAP Development Tool will also allow dam owners to easily update their EAPs on an annual basis as required by the new law.

Additionally, local emergency management agencies and DENR staff that respond to emergency conditions at dams will have access to the particular EAPs in their county and will be notified automatically via email when a change is made to the EAP via the EAP Development Tool.

High or intermediate hazard dam EAPs must include a downstream inundation map to be approved in the EAP Development Tool. Inundation maps must depict areas affected by a dam failure and a sudden release of the impoundment. **According to the N.C. Board of Engineers and Land Surveyors, all inundation maps must be sealed by a professional engineer**. An inundation map sealed by a professional engineer may be provided by the dam owner and

saved within the EAP Development Tool. NCEM, through professional engineers under contract, may also offer this mapping service for dam owners in the near future at a reasonable cost. In addition, workshops to provide training on the use of this EAP Development Tool will be announced soon.

Please visit the web link periodically for updates. For questions regarding access or use of the EAP Development Tool, please contact Mr. Ken Ashe, PE, CFM of the Division of Emergency Management at Ken.Ashe@ncdps.gov or by phone at (919) 825-2297. If you have questions regarding the components of an EAP, please contact Mr. Roger King of the Division of Energy, Mineral, and Land Resources' Dam Safety Program at roger.king@ncdenr.gov or by phone at (919) 707-9220.