

Attachment H - Maintenance and Emergency Protocol (MEP) for the Catawba-Wateree Project

Introduction

Under some emergency, equipment failure and maintenance situations, certain license conditions may be impractical or even impossible to meet and may need to be suspended or modified temporarily to avoid taking unnecessary risks. The objectives of this protocol are to define the most likely situations of this type, identify the potentially impacted license conditions and outline the general approach that the Licensee will take to mitigate the impacts to license conditions and to communicate with the resource agencies and affected parties.

Note: Due to the potential variability of these abnormal situations, this protocol is not intended to give an exact step-by-step solution path. It will, however, provide basic expectations for the Licensee's approach to dealing with the situation. Specific details will vary and will be determined on a case-by-case basis as the protocol is being enacted.

The Licensee will review the requirements of this Attachment each time it is used and will consult with the organizations listed in Key Facts and Definitions Item 13 below if the Licensee determines revisions are warranted. The Licensee will file the revised MEP with the FERC, including filing a license amendment request if necessary.

Key Facts and Definitions

1. Human Health and Safety and the integrity of the Public Water Supply and Electric Systems are of Utmost Importance – Nothing in this protocol will limit the Licensee's ability to take any and all lawful actions necessary at its hydro projects to protect human health and safety, protect its equipment from major damage, protect the equipment of the Large Water Intake owners from major damage, and ensure the stability of the regional electric grid. It is recognized that the Licensee may take the steps that are necessary to protect these things without prior consultation or notification.
2. Full Pond Elevation – Also referred to simply as “full pond”, this is the level of a reservoir that corresponds to the point at which water would first begin to spill from the reservoir's dam(s) if the Licensee took no action. This level corresponds to the lowest point along the top of the spillway (including flashboards) for reservoirs without flood gates and to the lowest point along the top of the flood gates for reservoirs that have them. To avoid confusion among the many reservoirs the Licensee operates, it has adopted the practice of referring to the Full Pond Elevation for all of its reservoirs as equal to 100.0 ft. relative. The Full Pond Elevations for the Catawba-Wateree Project reservoirs are:

Reservoir	Full Pond Elevation (ft. above Mean Sea Level)
Lake James	1200.0
Lake Rhodhiss	995.1
Lake Hickory	935.0

Reservoir	Full Pond Elevation (ft. above Mean Sea Level)
Lookout Shoals Lake	838.1
Lake Norman	760.0
Mountain Island Lake	647.5
Lake Wylie	569.4
Fishing Creek Reservoir	417.2
Great Falls Reservoir	355.8
Cedar Creek Reservoir	284.4
Lake Wateree	225.5

3. Normal Minimum Elevation – The level of a reservoir (measured in ft above Mean Sea Level (msl) or feet relative to the full pond contour with 100.0 ft corresponding to full pond) that defines the bottom of the reservoir's Normal Operating Range for a given day of the year. If net inflows to the reservoir are kept within some reasonable tolerance of the average or expected amounts, hydro project equipment is operating properly and no protocols for abnormal conditions have been implemented, reservoir level excursions below the Normal Minimum Elevation should not occur.
4. Normal Maximum Elevation – The level of a reservoir (measured in ft above Mean Sea Level (msl) or feet relative to the full pond contour with 100.0 ft corresponding to full pond) that defines the top of the reservoir's Normal Operating Range for a given day of the year. If net inflows to the reservoir are kept within some reasonable tolerance of the average or expected amounts, hydro project equipment is operating properly and no protocols for abnormal conditions have been implemented, reservoir level excursions above the Normal Maximum Elevation should not occur.
5. Normal Target Elevation – The level of a reservoir (measured in ft above Mean Sea Level (msl) or feet relative to the full pond contour with 100.0 ft corresponding to full pond) that the Licensee will endeavor in good faith to achieve, unless operating in the Low Inflow Protocol, the Maintenance and Emergency Protocol, the Spring Reservoir Level Stabilization Program (Lakes James, Norman, Wylie and Wateree only), or a Spring Stable Flow Period (Lake Wateree only). Since inflows vary significantly and outflow demands also vary, the Licensee will not always be able to maintain actual reservoir levels at the Normal Target Elevation. The Normal Target Elevation will fall within the Normal Operating Range, but it may not always be the average of the Normal Minimum and Normal Maximum Elevations.
6. Normal Operating Range – The band of reservoir levels within which the Licensee normally attempts to maintain a given reservoir that it operates on a given day. Each reservoir has its own specific Normal Operating Range, bounded by a Normal Maximum Elevation and a Normal Minimum Elevation. If net inflows to the reservoir are kept within some reasonable tolerance of the average or expected amounts, hydro project equipment is operating properly and

- no protocols for abnormal conditions have been implemented, reservoir level excursions outside of the Normal Operating Range should not occur.
7. Returning to Normal – Some of the abnormal situations noted in this MEP can impact the Licensee's ability to operate the hydro project in the most efficient and safest manner for power production. The Licensee will therefore endeavor in good faith to repair existing hydro project equipment and facilities and return them to service within a reasonable period of time, commensurate with the severity of the equipment / facility repair requirements. If the Licensee decides that repair is not cost-effective or that hydro station or dam retirement is necessary, the Licensee will notify the parties to the Final Agreement and consult with them as well as the FERC to determine any necessary modifications of the New License and/or the Final Agreement.
 8. Incidental Maintenance – These are maintenance activities at hydro project works that are very brief in nature or that require minimal if any deviation from normal license conditions. For the purposes of this protocol, maintenance of hydro project works that does not require deviation from any license conditions related to prescribed flow releases from project structures, or the Normal Operating Ranges for reservoir levels or are less than 24 hours in duration is considered Incidental Maintenance and, except for the identified notification for Incidental Maintenance that impacts prescribed flow releases, are exempt from the requirements of this protocol.
 9. Notification Guidance
 - a. Scheduled Maintenance that Affects License Conditions – Once a likely maintenance schedule has been established, the Licensee will endeavor in good faith to provide as much advance notice as possible to the affected parties identified in this protocol. Typically, scheduled maintenance is planned months in advance.
 - b. Unscheduled Maintenance and Emergencies that Affect License Conditions – It is not possible for the Licensee to assure any level of advance notice. For these situations, the Licensee will endeavor in good faith to inform the affected parties identified in this protocol within some reasonable amount of time after the situation has been identified.
 10. Relationship Between this Protocol and the Low Inflow Protocol – The Low Inflow Protocol (LIP) provides for reductions in generation flows, instream flows and recreation flow releases and modification of the Normal Operating Ranges for reservoir levels when water demands on the reservoirs substantially exceed net inflow. Lowered reservoir levels caused by situations addressed under this Maintenance & Emergency Protocol (MEP) will not invoke implementation of the LIP. Also, if the LIP has already been implemented at the time that a situation covered by this MEP is initiated, the Licensee will typically suspend implementation of the LIP until the MEP situation has been eliminated. The Licensee may however choose to continue with the LIP if needed.
 11. Peak Recreation Season – This is the portion of the year when boating and fishing levels are at their highest. For the purposes of this protocol, this season is defined as April 1 through September 30.
 12. Critical Flows – These are the minimum instream flow releases from the hydro developments that may be necessary to:

- a. prevent long-term or irreversible damage to aquatic communities consistent with the resource management goals and objectives for the affected stream reaches;
- b. provide some basic level of operability for large water intakes located on regulated river reaches; and,
- c. provide some basic level of water quality maintenance in the affected stream reaches.

For the purposes of the LIP and this MEP, the Critical Flows are as follows:

- a. Linville River, below the Bridgewater Development: 75 cubic feet per second (cfs).
 - b. Catawba River Bypassed Reach below the Bridgewater Development: 25 cfs.
 - c. Oxford Regulated River Reach below the Oxford Development: 100 cfs.
 - d. Lookout Shoals Regulated River Reach below the Lookout Shoals Development: 80 cfs.
 - e. Wylie Regulated River Reach below the Wylie Development: 700 cfs
 - f. Great Falls Bypassed Reaches (Long and Short) at the Great Falls-Dearborn Development: 450 cfs and 80 cfs respectively.
 - g. Wateree Regulated River Reach below the Wateree Development: 800 cfs
 - h. Leakage flows at the remaining Project structures. Leakage flows are defined as the flow of water through wicket gates when the hydro units are not operating and seepage through the Project structures at each development.
13. Critical Reservoir Elevation – The level of water in a reservoir (measured in feet above Mean Sea Level or feet relative to the full pond contour with 100.0 ft. corresponding to full pond) below which a large public water supply intake, large industrial intake, or regional power plant intake located on the reservoir will not operate at its Licensee-approved capacity. The Critical Reservoir Elevations, as of the revision date of this AIP, are defined below:

Reservoir	Critical Reservoir Elevation (ft. relative to local datum)	Type of Limit
Lake James	61.0	Power Production
Lake Rhodhiss	89.4	Municipal Intake
Lake Hickory	94.0	Municipal Intake
Lookout Shoals Lake	74.9	Municipal Intake
Lake Norman	90.0	Power Production
Mountain Island Lake	94.3	Power Production
Lake Wylie	92.6	Industrial Intake
Fishing Creek Reservoir	95.0	Municipal Intake

Reservoir	Critical Reservoir Elevation (ft. relative to local datum)	Type of Limit
Great Falls Reservoir	87.2	Power Production
Cedar Creek Reservoir	80.3	Power Production
Lake Wateree	92.5	Municipal Intake

14. Organizational abbreviations include the NC Department of the Environment and Natural Resources (NCDENR), NC Wildlife Resources Commission (NCWRC), NC State Historic Preservation Office (NCSHPO), South Carolina Department of Natural Resources (SCDNR), South Carolina Department of Health and Environmental Control (SCDHEC), SC State Historic Preservation Office (SCSHPO), United States Fish & Wildlife Service (USFWS), United States Geological Survey (USGS), American Whitewater Affiliation (AW), United States Bureau of Indian Affairs (USBIA), Catawba Indian Nation (CIN) and the Eastern Band of Cherokee Indians (EBCI).
15. Voltage and Capacity Emergencies – The electric transmission system serving the project area is part of the Licensee’s main transmission system. The Licensee’s system is connected to other large transmission systems located in the southeast. If the Licensee’s system reliability is at risk due to Voltage and Capacity Emergencies, the ability to provide secure and continuous electric service to the Licensee’s electric customers becomes compromised. The Licensee’s System Operating Center (SOC) and Transmission Control Center (TCC) continuously monitor the electric transmission system. Therefore, for the purposes of this protocol, a voltage or capacity emergency shall exist when declared by the Licensee’s SOC or TCC.
16. Large Water Intake – For the purposes of this Maintenance and Emergency Protocol, a Large Water Intake is any intake (e.g. public water supply, industrial, agricultural, power plant, etc.) having a maximum instantaneous capacity greater than or equal to one Million Gallons per Day (MGD) that withdraws water from the Catawba-Wateree River Basin.
17. Preparation for High Inflow Events – With modern forecasting, it is more possible than ever to predict large precipitation events and to increase generation hours to reduce reservoir levels in order to mitigate the potential for spilling and high water. Typically, this type of advance action is taken from 1 to 5 days or more before the expected arrival of the storm. It is assumed that the Normal Operating Ranges of reservoir levels may not include adequate flexibility (i.e. band width) to allow for this type of reservoir level reduction under heavy inflow circumstances, and therefore, allowances are made in this MEP to lower reservoir levels below the Normal Minimum Elevations if needed in preparation for such events.
18. Large Extended Drawdown – Any drawdown of a Project reservoir that will expose substantial lakebed areas for an extended period of time that are not normally exposed during the year. For the purposes of this document, a large extended drawdown is any drawdown that is expected to maintain lake elevation for at least 30 consecutive days at levels that are at least five feet below the lowest Normal Minimum Elevation for that reservoir.

Assumptions

1. Instream Flows For Recreation – The New License for the Catawba-Wateree Project includes the prescribed recreational flow releases as listed in Section 3.0 of the AIP.
2. Instream Flows For Aquatic Habitat – The New License for the Catawba-Wateree Project includes the instream flow requirements for aquatic habitat as listed in Section 4.0 of the AIP.
3. Actions to Support Water User Needs – The New License for the Catawba-Wateree Project includes actions to support water user needs as listed in Section 5.0 of the AIP.
4. Public Information System – The Licensee will maintain public information readily available on its website and phone system as identified in Section 8.0 of the AIP.
5. Normal Operating Range for Reservoir Levels – The New License for the Catawba-Wateree Project includes the Normal Operating Ranges for the reservoirs (i.e., Normal Minimum, Normal Maximum and Normal Target Elevations) as listed in Section 2.0 of the AIP.

Guidance for Responding to Abnormal Conditions

This section provides guidance for responding to the most likely conditions identified in the table below. The table identifies the most likely abnormal conditions when this protocol will be enacted and the license requirements that would most likely be impacted.

Abnormal Condition			Potentially Impacted License Requirements		
Condition Letter	Condition Name	Indications	Flows in Bypassed Reaches	Flows in Regulated River Reaches	Normal Operating Range for Reservoir Levels
A	Hydro Unit Maintenance	Maintenance will require hydro unit shutdown.	X	X	X
B	Maintenance of Minimum Flow Devices	Maintenance will require interruption of scheduled minimum releases from normal locations	X	X	
C	Dam Safety Emergency	Condition A or B (i.e. dam failure has occurred, is imminent or a potentially hazardous situation exists) is declared per Emergency Action Plan or other dam safety concern is identified.	X	X	X
D	Voltage or Capacity Emergency	Voltage or capacity conditions on the electric grid in the Licensee's system or the larger regional electric grid cause the Licensee's system reliability and safety to be at risk and a voltage or capacity emergency is declared by Licensee's System Operating Center (SOC) or Transmission Control Center (TCC).	X	X	X
E	Reservoir Drawdown Below Normal Minimum Elevation due to maintenance, emergency or other reasons (not due to low or high inflow)	The reservoir level is below Normal Minimum Elevation	X	X	X
F	River Access Special Circumstances	Safe access to bypasses or regulated river reaches requires interruption of scheduled/minimum releases from normal locations	X	X	

Abnormal Condition			Potentially Impacted License Requirements		
Condition Letter	Condition Name	Indications	Flows in Bypassed Reaches	Flows in Regulated River Reaches	Normal Operating Range for Reservoir Levels
G	Expected or existing high inflow event	The reservoir level at a reservoir is significantly above or below the Normal Operating Range			X

Communication with Resource Agencies and Affected Parties

General Notification

As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public. Specific consultation is discussed below for each identified abnormal situation.

Notification and Consultation

Notification and consultation requirements are specified for each abnormal condition. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the abnormal condition on the environmental, cultural and human needs relative to the hydro project.

Abnormal Condition A.1 – Scheduled Hydro Unit Maintenance

Mitigating Actions

1. Scheduling – To the extent practical, the Licensee will avoid scheduling hydro unit maintenance that would impact flow requirements for aquatic habitat, water quality, recreation, navigation or downstream water uses, 1) unless it is likely that the equipment condition will cause damage or unscheduled unit maintenance if repairs are delayed, 2) during Peak Recreation Season, and 3) during Spring Reservoir Level Stabilization Periods. If the maintenance affects equipment that provides the normal method of providing prescribed recreational flows, then the Licensee will endeavor in good faith to replace some or all of the missed flows that are normally scheduled for recreation. This can be accomplished by providing replacement flow releases at the Oxford Development, the Wylie Development, and the Fishing Creek Development (for the Great Falls Bypassed Reaches) through the use of spillway gates. At any of the developments, replacement flow releases can be scheduled for another time after the maintenance is over (preferred method). The replacement recreation flow releases will occur during the same calendar year as originally scheduled. A recreation flow schedule planning meeting will be held each March (see AIP Section 3.0) and contingency dates for make-up releases can be identified at that time.
2. Drawing Down the Affected Reservoir –To minimize the impacts to its electric customers, the Licensee may choose to draw down a reservoir using its hydro units to a point where spillage from the dam is expected to be minimized during the maintenance, but not to levels below the Critical Reservoir Elevations.
3. Avoid Falling Below the Critical Flows – To the extent practical, the Licensee will avoid falling below any of the Critical Flows as noted above. If it is determined that 100 percent exceedance of the Critical Flows cannot reasonably be achieved, the Licensee will work with the resource agencies to (a) monitor any potential aquatic species impacts in the affected stream segments and (b) replace any aquatic species mortalities that are identified. The Licensee will also work with any affected Large Water Intake owners or Downstream Effluent Dischargers to minimize the impacts of any reduced flow releases.

Communication with Resource Agencies and Affected Parties

Abnormal Condition A.1 – Scheduled Hydro Unit Maintenance		
Notification	Consultation	Comments
	NCDENR NCWRC USFWS	For developments in NC (including Wylie). If the maintenance will affect any required flow release or Normal Operating Range for Reservoir Levels, initiate consultation as soon as maintenance schedules are determined (typically months in advance), but at least 10 days prior to beginning any reservoir drawdown or the hydro unit maintenance.
	SCDNR SCDHEC USFWS	For developments in SC. If the maintenance will affect any required flow release or Normal Operating Range for Reservoir Levels, initiate consultation as soon as maintenance schedules are determined (typically months in advance), but at least 10 days prior to beginning any reservoir drawdown or the hydro unit maintenance.
	AW	Consult at least 10 days prior to maintenance if it will affect the prescribed recreation flow releases.
	NCSHPO SCSHPO CIN EBCI	Consult at least 10 days prior to maintenance or beginning any reservoir drawdown, NCSHPO and SCSHPO if maintenance will affect Historic Properties and include consultation with CIN and EBCI if the maintenance will result in a Large Extended Drawdown.
	USBIA CIN	Consult at least 10 days prior to maintenance, if it affects normal minimum flow releases from the Wylie Development.
	Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	Consult with intake owners and downstream effluent dischargers at least 10 days prior to beginning maintenance or any reservoir drawdown if flow releases below Critical Flows are required.
Access Area Closure Notification		The Licensee will conduct notification procedures for any temporary recreation facility/Access Area closures (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.
General		As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public.

Note 1 – If affected by the maintenance.

Abnormal Condition A.2 – Unscheduled Hydro Unit Maintenance

Mitigating Actions

1. Replacing Recreation Releases – If the maintenance affects equipment that provides the normal method of providing prescribed recreational flows, then the Licensee will endeavor in good faith to replace some or all of the missed flows that are normally scheduled for recreation. This can be accomplished by providing replacement flow releases at the Oxford Development, Wylie Development, and the Fishing Creek Development (for the Great Falls Bypassed Reaches) through the use of spillway gates. At any of the developments, replacement flow releases can be scheduled for another time after the maintenance is over (preferred method). The replacement recreation flow releases will occur during the same calendar year as originally scheduled. A recreation flow schedule planning meeting will be held each March (see AIP Section 3.0) and contingency dates for make-up releases can be identified at that time.
2. Drawing Down the Affected Reservoir –To minimize the impacts to its electric customers, the Licensee may choose to draw down a reservoir using its hydro units to a point where spillage from the dam is expected to be minimized during the maintenance, but not to levels below the Critical Reservoir Elevations.
3. Avoid Falling Below the Critical Flows – To the extent practical, the Licensee will avoid falling below any of the Critical Flows as noted above. If it is determined that 100 percent exceedance of the Critical Flows cannot reasonably be achieved, the Licensee will work with the resource agencies to (a) monitor any potential aquatic species impacts in the affected stream segments and (b) replace any aquatic species mortalities that are identified. The Licensee will also work with any affected Large Water Intake owners and Downstream Effluent Dischargers to minimize the impacts of any reduced flow releases.

Communication with Resource Agencies and Affected Parties

Abnormal Condition A.2 – Unscheduled Hydro Unit Maintenance		
Notification	Consultation	Comments
NCDENR NCWRC USFWS	NCDENR NCWRC USFWS	For developments in NC (including Wylie). If the maintenance will affect any required flow release or Normal Operating Range for Reservoir Levels, perform notification as soon as possible after the unscheduled maintenance begins, but no longer than 5 days afterwards. Initiate consultation within 10 days.
SCDNR SCDHEC USFWS	SCDNR SCDHEC USFWS	For developments in SC. If the maintenance will affect any required flow release or Normal Operating Range for Reservoir Levels, perform notification as soon as possible after the unscheduled maintenance begins, but no longer than 5 days afterwards. Initiate consultation within 10 days.
AW	AW	Notify (within 5 days) and consult (within 10 days) afterwards if maintenance will affect the prescribed recreation flow releases.
NCSHPO SCSHPO CIN EBCI	NCSHPO SCSHPO CIN EBCI	Notify (within 5 days) and consult (within 10 days) afterwards with NCSHPO and SCSHPO if maintenance will affect Historic Properties and include consultation with CIN and EBCI if the maintenance will result in a Large Extended Drawdown.
USBIA CIN	USBIA CIN	Notify (within 5 days) and consult (within 10 days) afterwards if maintenance affects normal minimum flow releases from the Wylie Development.
Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	Notify (within 5 days) and consult (within 10 days) afterwards with intake owners and downstream effluent dischargers if flow releases below Critical Flows are required.
Access Area Closure Notification		The Licensee will conduct notification procedures for any temporary recreation facility/Access Area closures (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.
General		As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public.

Note 1 – If affected by the maintenance.

Abnormal Condition B.1 – Maintenance of the Normal Means of Providing Minimum Flows (Scheduled)

Mitigating Actions

1. Scheduling - To the extent practical, the Licensee will avoid scheduling maintenance that would impact the ability of the Licensee to release flows for aquatic habitat, water quality or downstream water uses, unless it is likely that the equipment condition will cause damage or an unscheduled maintenance condition if repairs are delayed.
2. Providing Minimum Flows - If the maintenance cannot avoid impacting minimum flows for aquatic habitat, water quality or downstream water uses, then the Licensee will endeavor in good faith to provide some of the minimum flows in the affected stream reaches. This can be accomplished by partially opening spillway gates at the Oxford Development, the Wylie Development and the Fishing Creek Development (for the Great Falls Bypassed Reaches). At all other sites, leakage from the dams or other means of releasing flows (e.g., pulsing of hydro units at Bridgewater) will be provided during the maintenance. Note that it would be a very unusual occurrence to not have any generation or spill control equipment available at these sites.
3. Avoid Falling Below the Critical Flows – To the extent practical, the Licensee will avoid falling below any of the Critical Flows as noted above. If it is determined that 100 percent exceedance of the Critical Flows cannot reasonably be achieved, the Licensee will work with the resource agencies to (a) monitor any potential aquatic species impacts in the affected stream segments and (b) replace any aquatic species mortalities that are identified. The Licensee will also work with any affected Large Water Intake owners and Downstream Effluent Dischargers to minimize the impacts of any reduced flow releases.

Communication with Resource Agencies and Affected Parties

Abnormal Condition B.1 – Maintenance of the Normal Means of Providing Minimum Flows (Scheduled)		
Notification	Consultation	Comments
	NCDENR NCWRC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	For developments in NC. If the maintenance cannot avoid impacting minimum flows for aquatic habit, water quality or downstream water uses, initiate consultation as soon as maintenance schedules are determined (typically months in advance), but at least 10 days prior to beginning the maintenance.
	SCDNR SCDHEC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	For developments in SC. If the maintenance cannot avoid impacting minimum flows for aquatic habit, water quality or downstream water uses, initiate consultation as soon as maintenance schedules are determined (typically months in advance), but at least 10 days prior to beginning the maintenance.
	USBIA CIN	Consult if maintenance affects normal minimum flow releases from the Wylie Development, as soon as maintenance schedules are determined (typically months in advance), but at least 10 days prior to beginning the maintenance.
General		As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public.

Note 1 – If affected by the maintenance.

Abnormal Condition B.2 – Maintenance of the Normal Means of Providing Minimum Flows (Unscheduled)

Mitigating Actions

1. **Providing Minimum Flows** - If the maintenance cannot avoid impacting minimum flows for aquatic habitat, water quality or downstream water uses, then the Licensee will endeavor in good faith to provide some of the minimum flows in the affected stream reaches. This can be accomplished by partially opening spillway gates at the Oxford Development, the Wylie Development and the Fishing Creek Development (for the Great Falls Bypassed Reaches). At all other sites, leakage from the dams or other means of releasing flows (e.g., pulsing of hydro units at Bridgewater) will be provided during the maintenance. Note that it would be a very unusual occurrence to not have any generation or spill control capability available at these sites.
2. **Avoid Falling Below the Critical Flows** – To the extent practical, the Licensee will avoid falling below any of the Critical Flows as noted above. If it is determined that 100 percent exceedance of the Critical Flows cannot reasonably be achieved, the Licensee will work with the resource agencies to (a) monitor any potential aquatic species impacts in the affected stream segments and (b) replace any aquatic species mortalities that are identified. The Licensee will also work with any affected Large Water Intake owners and Downstream Effluent Dischargers to minimize the impacts of any reduced flow releases.

Communication with Resource Agencies and Affected Parties

Abnormal Condition B.2 – Maintenance of the Normal Means of Providing Minimum Flows (Unscheduled)		
Notification	Consultation	Comments
NCDENR NCWRC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	NCDENR NCWRC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	For developments in NC. If the maintenance cannot avoid impacting minimum flows for aquatic habit, water quality or downstream water uses, perform notification as soon as possible after the unscheduled maintenance begins, but no longer than 5 days afterwards. Initiate consultation within 10 days.
SCDNR SCDHEC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	SCDNR SCDHEC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	For developments in SC. If the maintenance cannot avoid impacting minimum flows for aquatic habit, water quality or downstream water uses, perform notification as soon as possible after the unscheduled maintenance begins, but no longer than 5 days afterwards. Initiate consultation within 10 days.
USBIA CIN	USBIA CIN	Notify if maintenance affects normal minimum flow releases from the Wylie Development, as soon as possible after the unscheduled maintenance begins, but no longer than 5 days afterwards. Initiate consultation within 10 days.
General		As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public.

Note 1 – If affected by the maintenance.

Abnormal Condition C – Dam Safety Emergency

Mitigating Actions

1. Safety Must Come First – If a Condition A or B is declared per the Licensee’s Emergency Action Plan, or other dam safety concerns arise, the Licensee may modify or suspend any license conditions immediately and for as long as necessary to restore the dam to a safe condition.

Communication with Resource Agencies and Affected Parties

Abnormal Condition C – Dam Safety Emergency		
Notification	Consultation	Comments
During EAP Condition A or B		Conducted strictly in accordance with the Licensee’s Emergency Action Plan. In cases where dam safety concerns arise that are not a Condition A or B per the Licensee’s Emergency Action Plan, consultation with resource agencies and affected parties will occur as soon as possible, after the dam safety concern arises.
Once Dam Safety Conditions Have Stabilized		As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public.
Access Area Closure Notification		The Licensee will conduct notification procedures for any temporary recreation facility/ Access Area closures (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.

Abnormal Condition D – Voltage and Capacity Emergencies

Mitigating Actions

1. Suspension of the Normal Operating Range for Reservoir Levels – If a voltage or capacity emergency (as defined above) occurs, the Licensee may modify or suspend reservoir level operating limitations immediately and for as long as necessary if doing so would allow additional hydro station operation that is needed to restore the electric grid to a stable condition. Reservoir levels will not, however, be reduced below the Critical Reservoir Elevations noted above.
2. Conserving Water for Power Generation - If a voltage or capacity emergency (as defined above) occurs and if it is expected to continue for an extended period of time (e.g. two weeks or more), the Licensee may reduce minimum flows to the Critical Flows (as defined above) and may modify or suspend any scheduled recreation flow releases if taking those actions is necessary to maintain the water inventory in Project reservoirs for use during the Voltage and Capacity Emergency. During a Voltage and Capacity Emergency, the Licensee will not deviate from the normal license conditions to conserve water for power generation strictly as a cost avoidance measure, but only to assist in addressing the emergency.
3. Replacing Lost Recreation Flow Releases – If scheduled recreation flow releases are lost, then once the emergency is over, the Licensee will endeavor in good faith to reschedule the releases during the same calendar year as originally scheduled. A recreation flow schedule planning meeting will be held each March (see AIP Section 3.0) and contingency dates for make-up releases can be identified at that time.

Communication with Resource Agencies and Affected Parties

Abnormal Condition D – Voltage and Capacity Emergencies		
Notification	Consultation	Comments
NCDENR NCWRC USFWS	NCDENR NCWRC USFWS	For developments in NC (Including Wylie). Perform notification as soon as possible, but no longer than 5 days following the deviation from a license condition for Voltage or Capacity Emergency reasons. Initiate consultation as soon as possible.
SCDNR SCDHEC USFWS	SCDNR SCDHEC USFWS	For developments in SC. Perform notification as soon as possible, but no longer than 5 days following the deviation from a license condition for Voltage or Capacity Emergency reasons. Initiate consultation as soon as possible.
AW	AW	Notify (within 5 days) and consult as soon as possible if maintenance will affect the prescribed recreation flow releases.
NCSHPO SCSHPO CIN EBCI	NCSHPO SCSHPO CIN EBCI	Notify (within 5 days) and consult with NCSHPO and SCSHPO if Voltage or Capacity Emergency will affect Historic Properties.
USBIA CIN	USBIA CIN	Notify (within 5 days) and consult as soon as possible if Voltage or Capacity Emergency affects normal minimum flow releases from the Wylie Development.
Access Area Closure Notification		The Licensee will conduct notification procedures for any temporary recreation facility/Access Area closures (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.
General		As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public.

Abnormal Condition E.1 – Reservoir Drawdown (Planned)

Mitigating Actions

1. Scheduling - To the extent practical, the Licensee will avoid scheduling reservoir drawdowns that would impact the ability of the Licensee to release the prescribed flows for aquatic habitat, water quality, recreation, navigation or downstream water uses. Also, to the extent practical, the Licensee will avoid scheduling reservoir drawdowns during the Peak Recreation Season.
2. Alternative Means to Provide Minimum Flows - If the drawdown cannot avoid impacting minimum flows for aquatic habitat, water quality or downstream water uses, then the Licensee will endeavor in good faith to provide some of the minimum flows in the affected stream reaches by utilizing the generating equipment, spill gates or leakage at the developments for flows required downstream of the powerhouses. Note that it would be a very unusual occurrence to not have any generating units or spill devices available at these sites for flows required downstream of powerhouses.
3. Avoid Falling Below the Critical Flows – To the extent practical, the Licensee will avoid falling below any of the Critical Flows as noted above. If it is determined that 100 percent exceedance of the Critical Flows cannot reasonably be achieved, the Licensee will work with the resource agencies to (a) monitor any potential aquatic species impacts in the affected stream segments and (b) replace any aquatic species mortalities that are identified. The Licensee will also work with any affected Large Water Intake owners and Downstream Effluent Dischargers to minimize the impacts of the reduced flow releases.
4. Avoid Falling Below Critical Reservoir Elevations – To the extent practical, the Licensee will avoid falling below any of the Critical Reservoir Elevations as noted above. If it is determined that 100 percent exceedance of the Critical Reservoir Elevations cannot reasonably be achieved, the Licensee will work with any affected Large Water Intake owners to minimize the impacts of the drawdown.

Communication with Resource Agencies and Affected Parties

Abnormal Condition E.1 – Reservoir Drawdown (Planned)		
Notification	Consultation	Comments
	NCDENR NCWRC USFWS	For developments in NC (including Wylie). Consult as soon as approximate dates are determined (typically months in advance), but at least 10 days prior to beginning drawdown.
	SCDNR SCDHEC USFWS	For developments in SC. Consult as soon as approximate dates are determined (typically months in advance), but at least 10 days prior to beginning drawdown.
	NCSHPO SCSHPO CIN EBCI	Consult in the event of a Large Extended Drawdown as soon as approximate dates are determined (typically months in advance), but at least 10 days prior to beginning drawdown.
	Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	If the drawdown will go below Critical Reservoir Elevations that affect the operations of a Large Water Intake located in a reservoir or will cause flow releases to drop below Critical Flows supporting Large Water Intakes or Downstream Effluent Dischargers, the Licensee will consult with the owner of the intake or discharge facility as soon as approximate dates are known (typically months in advance), but at least 10 days prior to beginning the drawdown.
Access Area Closure Notification		The Licensee will conduct notification procedures for any temporary recreation facility/Access Area closures (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.
General		As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public.

Note 1 – If affected by the reservoir drawdown.

Abnormal Condition E.2 – Reservoir Drawdown (Unplanned)

Mitigating Actions

1. Alternative Means to Provide Minimum Flows - If the drawdown cannot avoid impacting minimum flows for aquatic habitat, water quality, recreation, navigation or downstream water uses, then the Licensee will endeavor in good faith to provide some or all of the missed minimum flows in the affected stream reaches. This can be accomplished by utilizing the generating equipment, spill gates or leakage at the developments for flows required downstream of the powerhouses. Note that it would be a very unusual occurrence to not have any generating units or spill devices available at these sites for flows required downstream of powerhouses.
2. Avoid Falling Below the Critical Flows – To the extent practical, the Licensee will avoid falling below any of the Critical Flows as noted above. If it is determined that 100 percent exceedance of the Critical Flows cannot reasonably be achieved, the Licensee will work with the resource agencies to (a) monitor any potential aquatic species impacts in the affected stream segments and (b) replace any aquatic species mortalities that are identified. The Licensee will also work with any affected Large Water Intake owners and Downstream Effluent Dischargers to minimize the impacts of the reduced flow releases.
3. Avoid Falling Below Critical Reservoir Elevations – To the extent practical, the Licensee will avoid falling below any of the Critical Reservoir Elevations as noted above. If it is determined that 100 percent exceedance of the Critical Reservoir Elevations cannot reasonably be achieved, the Licensee will work with any affected Large Water Intake owners to minimize the impacts of the drawdown.

Communication with Resource Agencies and Affected Parties

Abnormal Condition E.2 – Reservoir Drawdown (Unplanned)		
Notification	Consultation	Comments
NCDENR NCWRC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	NCDENR NCWRC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	For developments in NC (including Wylie). If the drawdown cannot avoid impacting minimum flows for aquatic habitat, water quality, recreation or downstream water uses, perform notification as soon as possible, but no longer than 5 days after the drawdown begins . Begin consultation within 10 days after the drawdown begins .
SCDNR SCDHEC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	SCDNR SCDHEC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	For developments in SC. If the drawdown cannot avoid impacting minimum flows for aquatic habitat, water quality, recreation, navigation or downstream water uses, perform notification as soon as possible, but no longer than 5 days after the drawdown begins . Begin consultation within 10 days after the drawdown begins .
USBIA CIN	USBIA CIN	Perform notification if the drawdown affects releases from the Wylie Development as soon as possible, but no longer than 5 days after the drawdown begins . Begin consultation within 10 days after the drawdown begins .
AW	AW	Notify (within 5 days) and consult as soon as possible if the drawdown will affect prescribed recreation flow releases.
General		As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public.

Note 1 – If affected by the drawdown.

Abnormal Condition F – Special River Access Circumstances

Mitigating Actions

1. Scheduling – To the extent practical, the Licensee will 1) avoid scheduling Special River Access Circumstances that would impact the ability of the Licensee to release flows for aquatic habitat, water quality, navigation, recreation or downstream water uses and 2) avoid scheduling during Peak Recreation Season.
2. Avoid Falling Below the Critical Flows – To the extent practical, the Licensee will avoid falling below any of the Critical Flows as noted above. If it is determined that 100 percent exceedance of the Critical Flows cannot reasonably be achieved, the Licensee will work with the resource agencies to (a) monitor any potential aquatic species impacts in the affected stream segments and (b) replace any aquatic species mortalities that are identified. The Licensee will also work with any affected Large Water Intake owners and Downstream Effluent Dischargers to minimize the impacts of the reduced flow releases.
3. Avoid Falling Below Critical Reservoir Elevations – To the extent practical, the Licensee will avoid falling below any of the Critical Reservoir Elevations as noted above. If it is determined that 100 percent exceedance of the Critical Reservoir Elevations cannot reasonably be achieved, the Licensee will work with any affected Large Water Intake owners to minimize the impacts of the drawdown.

Communication with Resource Agencies and Affected Parties

Abnormal Condition F – Special River Access Circumstances		
Notification	Consultation	Comments
	NCDENR NCWRC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	For developments in NC (including Wylie). If the circumstances cannot avoid impacting minimum flows for aquatic habitat, water quality, navigation, recreation or downstream water uses, initiate consultation as soon as soon as the dates are known, but at least 10 days prior to beginning the temporary flow alteration. Initiate consultation for unplanned river access within 5 days after the temporary flow alteration.
	SCDNR SCDHEC USFWS Large Water Intake Owners ¹ Downstream Effluent Dischargers ¹	For developments in SC. If the circumstances cannot avoid impacting minimum flows for aquatic habitat, water quality, navigation, recreation or downstream water uses, initiate consultation as soon as soon as the dates are known, but at least 10 days prior to beginning the temporary flow alteration. Initiate consultation for unplanned river access within 5 days after the temporary flow alteration.
	USBIA CIN	If the flow modifications for the planned River Access affect flow releases from the Wylie Development, initiate consultation as soon as the dates are known but at least 10 days prior to beginning the temporary flow modification. Initiate consultation for unplanned river access within 5 days after the temporary flow alteration.
AW	AW	Notify (within 5 days) and consult as soon as possible if the drawdown will affect prescribed recreation flow releases.
General		As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public.

Note 1 – If affected by Special River Access Circumstances.

Abnormal Condition G – Expected or Existing High Inflow Event

Mitigating Actions

1. As outlined in item 16 of the Key Facts and Definitions section of this protocol, the Licensee may reduce reservoir levels significantly below the Normal Minimum Elevation, but not below the Critical Reservoir Elevations in preparation for high inflow events in order to minimize the effects of spilling. Reservoir levels may also rise significantly above Normal Maximum Elevations in response to high inflow events. The reservoir levels may be below Normal Minimum Elevations or above Normal Maximum Elevations for as long as necessary to minimize the effects of spilling and to minimize reservoir elevations during high inflow events.

Communication with Resource Agencies and Affected Parties

Abnormal Condition G – Expected or Existing High Inflow Event		
Notification	Consultation	Comments
NCDENR NCWRC USFWS		For developments in NC (including Wylie). The Licensee will perform notification as soon as possible following or prior to a deviation from license requirements for an existing or expected high inflow event.
SCDNR SCDHEC USFWS		For developments in SC. The Licensee will perform notification as soon as possible following or prior to a deviation from license requirements for an existing or expected high inflow event.
Access Area Closure Notification		The Licensee will conduct notification procedures for any temporary recreation facility/Access Area closures (e.g., closure due to extended low or high reservoir levels) in accordance with the Recreation Management Plan.
General		As soon as possible after the Licensee determines that the response to an abnormal condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and/or its reservoir level toll-free phone system to inform the general public.