UNITED STATES OF AMERICA 135 FERC ¶ 62,107
FEDERAL ENERGY REGULATORY COMMISSION

Duke Energy Carolinas, LLC Project No. 2686-032

ORDER ISSUING NEW LICENSE

(May 4, 2011)

INTRODUCTION

1. On January 26, 2004, Duke Energy Carolinas, LLC (Duke)[1] filed, pursuant to sections 4(e) and 15 of the Federal Power Act (FPA),[2] an application for a new license to continue operation and maintenance of the West Fork Hydroelectric Project No. 2686. The project's authorized capacity being licensed is 24.6 megawatts (MW). The project is located on the West Fork of the Tuckasegee River in Jackson County, North Carolina.[3] The project does not occupy any federal lands. As discussed below, I am issuing a new license for the project.

---

[1] The project was originally licensed to Nantahala Power and Light Company. In 2000, Nantahala Power and Light Company changed its name to Nantahala Power and Light, a division of Duke Energy Corporation. *See* 91 FERC ¶ 62,235 (2000). In 2001, the license was transferred from Nantahala Power and Light, a division of Duke Energy Corporation, to Duke Energy Corporation (under the name Duke Power, a division of Duke Energy Corporation, Nantahala Area). 96 FERC ¶ 62,142 (2001). In 2007, the license was transferred to Duke Energy Carolinas, LLC, and Duke Energy Carolinas, LLC was substituted as the relicense applicant. 118 FERC ¶ 62,223 (2007).

[2] 16 U.S.C. §§ 797(e) and 808 (2006).

[3] The Tuckasegee River is a tributary of the Little Tennessee River, a navigable waterway which empties into the Tennessee River. *See* 13 F.P.C. 14 (1954). Pursuant to section 23(b)(1) of the FPA, the project is required to be licensed because of its location on a stream over which Congress has jurisdiction under the Commerce Clause, its connection to an interstate power grid, and construction occurring at the project after 1935. *See Nantahala Power and Light Company, 36* F.P.C. 119 (1966), *reh'g denied*, 36 F.P.C. 581 (1966), *aff'd, Nantahala Power and Light Co. v. F.P.C.*, 384 F.2d 200 (4th Cir. 1967), *cert. denied*, 390 U.S. 945 (1968).

BACKGROUND

2. The Commission issued the original license for the project on January 28, 1981, and the license expired on January 31, 2006.[4] Since then, the project has operated under an annual license pending the disposition of the new license application.

3. The relicense application incorporates the provisions of the Tuckasegee Cooperative Stakeholder Team Settlement Agreement (Tuckasegee agreement),[5] which was entered into by Duke and multiple stakeholders and is intended to resolve, among the signatories, all issues related to the relicensing of the West Fork Project and the East Fork Project No. 2698,[6] and the license surrender and removal of the Dillsboro Project No. 2602.[7]

---

[4] 14 FERC ¶ 62,087 (1981). The license was issued with an effective date of May 1, 1965, and a termination date of 25 years from the last day of the month in which the license was issued, i.e. January 31, 2006.

[5] Signatories to the Tuckasegee agreement are: Duke, American Whitewater, Bear Creek Lake and Cedar Cliff Lake Residents, Carolina Canoe Club, Dillsboro River Company, the Eastern Band of Cherokee Indians, Trout Unlimited, North Carolina Department of Environment and Natural Resources, North Carolina Wildlife Federation, North Carolina Wildlife Resources Commission, Signal Ridge Marina, Swain County Economic Development Commission, Town of Dillsboro, Town of Sylva, Tuckasegee Gorge Association, U.S. Fish and Wildlife Service, and the U.S. Forest Service.

A copy of the Tuckasegee agreement is included in Volume IV of Duke's License Application (filed January 26, 2004). On January 8, 2004, Duke also filed a copy of the Tuckasegee agreement in the East Fork Project and West Fork Project public records.

[6] The license for the East Fork Project, which is located on the East Fork of the Tuckasegee River and requires recreation flow releases to be coordinated with those of the West Fork Project, is also being issued today.

[7] The surrender and removal of the Dillsboro Project, located on the Tuckasegee River downstream of the East and West Fork Projects, was authorized on July 19, 2007. *See* 120 FERC ¶ 61,054 (2007), *reh'g granted in part*, 123 FERC ¶ 61,069 (2008), *appeal denied, Jackson Co. v. FERC*, 589 F.3d 1284 (D.C. Cir. 2009).

4. The Commission published notice of the application on June 4, 2004, setting August 3, 2004, as the deadline for filing notices of intervention and motions to intervene. Motions to intervene were filed in the proceeding by the Watershed Association of the Tuckasegee River, Jackson County Soil and Water Conservation District, Jackson County, Jackson County Parks and Recreation Department Advisory Board, North Carolina Wildlife Resources Commission (North Carolina WRC), North Carolina Department of Environment and Natural Resources (North Carolina DENR), T.J. Krueger, Dillsboro Inn and T.J. Walker, Western North Carolina Alliance, Friends of the Lake Glenville Association, Inc. (Friends of Lake Glenville), Cullowhee Falls, Inc. and Cullowhee Forest Property Owners Association, and the U.S. Department of the Interior (Interior).[8] In addition, by notice issued March 28, 2005, the Secretary of the Commission granted late motions to intervene that had been filed by American Whitewater Affiliation (American Whitewater) and, jointly, Macon County and the Town of Franklin. None of the intervenors oppose the project.

5. On January 21, 2005, the Commission published notice that the project was ready for environmental analysis and solicited comments, recommendations, terms and conditions, and prescriptions.[9] In response, timely comments, recommendations, and terms and conditions were filed by Interior, U.S. Fish and Wildlife Service (FWS), North Carolina WRC, and North Carolina DENR. On June 16, 2005, a group of municipal and local entities (community commenters) jointly filed untimely comments and recommendations.[10]

---

[8] The motions were timely and unopposed. Therefore, they were automatically granted under Rule 214(c)(1) of the Commission's regulations. 18 C.F.R. § 385.214(c)(1) (2010).

[9] Commission staff held scoping meetings on December 8 and 9, 2004, in Sylva, North Carolina. In addition, Commission staff held a public meeting on June 8, 2006, in Sylva, North Carolina, to provide interested persons an opportunity to comment on the draft environmental assessment.

[10] The community commenters are: Jackson County, Jackson County Soil and Water Conservation District, Jackson County Parks and Recreation Department Advisory Board, Jackson County Greenway Commission, Macon County, Town of Franklin, Town of Webster, Dillsboro Inn and T.J. Walker, Friends of Lake Glenville, Glenville Community Development Club, Cullowhee Falls, Inc., and Cullowhee Forest Property Owners Association, Inc.

6. On May 10, 2006, the Commission issued a draft Environmental Assessment (EA) for the relicensing of East Fork Project No. 2698, West Fork Project No. 2686, and Bryson Project No. 2601, and for the surrender of the Dillsboro Project No. 2602. The Bureau of Indian Affairs, Raymond Williams, U. S. Geological Survey (USGS), Interior, T.J. Krueger, H.J. Eichhorn, Douglass Odell, Friends of Lake Glenville, Western North Carolina Alliance, North Carolina WRC, American Whitewater, Michael Bamford, and Duke filed comments on the draft EA. A final EA was issued on July 14, 2006.[11]

7. The motions to intervene, comments, recommendations, and terms and conditions have been fully considered in determining whether, and under what conditions, to issue this license for the West Fork Project.

PROJECT DESCRIPTION

A. Project Area

8. The West Fork Project is located on the West Fork of the Tuckasegee River in western North Carolina and lies within the Tuckasegee River watershed, which is a sub-basin of the Little Tennessee River. The Tuckasegee River flows through the cities of Cullowhee, Sylva, Bryson, and Dillsboro, where the river enters the backwater of Fontana Lake, before it joins the Little Tennessee River approximately 50 miles from its headwaters. The project reservoirs are surrounded by steep, forested slopes ranging in elevation from 2,400 to 4,000 feet mean sea level (msl).[12]

B. Project Facilities

Although styled as a "preferred settlement," the pleading is unilateral (neither Duke nor any of the federal or state resource agencies are parties to it) and thus an agreement in name only. *See Duke Energy Carolinas, LLC*, 120 FERC ¶ 61,054 (2007), *order on reh'g*, 123 FERC ¶ 61,069 (2008). The community commenters' recommendations were considered in the EA for the project, and are discussed in this order, *infra*, as they relate to the West Fork Project.

[11] Unless otherwise specified, references in this order to the EA are to the final EA.

[12] *See* EA at 43.

9. The West Fork Project consists of two hydroelectric developments which are, from upstream to downstream, Glenville and Tuckasegee. At the Glenville development, the Glenville dam (or Thorpe dam) is located on the West Fork of the Tuckasegee River near river mile (RM) 9.7.[13] The Tuckasegee development's dam is located downstream near RM 3.1.

10. There are no known water consumption withdrawals within the West Fork Project area; however, the Tuckasegee Water and Sewer Authority withdraws an average 0.8 million gallons per day from the Tuckasegee River at Cullowhee River, North Carolina, about 9 miles downstream of the West Fork Project.

Glenville Development

11. The Glenville development consists of a 900-foot-long, 150-foot-high earth and rockfill Glenville dam with a crest elevation of 3,506.75 feet msl, and an adjacent 410-foot-long, 122-foot-high earth and rockfill saddle dam. Glenville dam impounds the 1,462-acre Lake Glenville at full pond level 3,491.75 feet msl. A spillway, located at the right abutment of the dam, includes two 25-foot-wide by 12-foot-high Tainter gates and six erodible fuse plug sections.[14] Water flows into the power intake, located in the right abutment of the dam, through trashracks and a set of tandem sluicegates, before traveling through a 16,287-foot-long power tunnel to a concrete and brick powerhouse. The powerhouse contains an Allis-Chalmers Horizontal Impulse-type generating unit with an installed capacity of 21.6 MW and a hydraulic capacity of 270 cubic feet per second (cfs). Power is transmitted to a substation adjacent to the powerhouse.

12. The Glenville development includes a 6.43-mile-long bypassed reach (on the West Fork of the Tuckasegee River).

Tuckasegee Development

13. The Tuckasegee development consists of a 254-foot-long, 61-foot-high concrete arch dam with a crest elevation of 2,290.67 feet msl. The dam impounds the 7.9-acre

[13] River miles on the West Fork of the Tuckasegee River begin at its confluence with the mainstem Tuckasegee River and continue to the headwaters.

[14] A fuse plug, or breaching section of a dam, is a section of a dam that is designed to wash out gradually when the reservoir's inflow exceeds spillway capacity and the reservoir reaches a specified level. This results in the gradual release of surplus flood waters without endangering the safety of the main dam.

Tuckasegee Lake at full pond level 2,278.75 feet msl. The dam's 233.5-foot-long spillway includes twenty four, 3-foot-high flashboards and a trashrack. Water flows into the power intake, located on the left side of the dam, through trashracks and a Tainter gate, before traveling through a 3,246-foot-long pressure tunnel, a vertical surge tank, and a 198-foot-long penstock to the powerhouse. The powerhouse contains one vertical S. Morgan Smith Francis-type generating unit with an installed capacity of 3.0 MW and a hydraulic capacity of 360 cfs. A 1.8-mile-long, 6.6-kilovolt (kV) transmission line carries power from the Tuckasegee powerhouse to a switchyard at the Glenville (Thorpe) development.

14. The Tuckasegee development includes a 1.24-mile-long bypassed reach (on the West Fork of the Tuckasegee River).

C. Project Recreation Sites

15. There are three project recreation sites at the Glenville development. The Powerhouse (or Low Water) Public Boat Access Area, located near the dam, has a boat ramp, a dock, and parking for approximately 30 to 45 vehicles with trailers. This site provides access to Lake Glenville when water levels are low. The Pine Creek Public Boat Access Area, located on the northwest corner of Lake Glenville, has three ramps for boat access, a dock, and parking for approximately 40 to 50 vehicles with trailers. When water levels are low, this site cannot be used for access to Lake Glenville. The Pines Day-Use Area, located just west of Glenville Dam, has four picnic tables and parking for up to six vehicles.

D. Project Boundary

16. The West Fork Project boundary, consisting of lands necessary for the safe operation and maintenance of the project and other purposes, such as recreation, shoreline control, and protection of environmental resources, encompasses about 1,953.18 acres.

17. The project boundary includes the two hydroelectric developments (Glenville and Tuckasegee), about 1.8 miles of transmission line connecting the two developments, and project recreation sites. The project boundary around the Glenville development encloses the dam and reservoir, powerhouse, penstocks, a 6.43-mile-long bypassed reach on the West Fork of the Tuckasegee River, and three recreation sites. The project boundary around the Tuckasegee development encloses the dam and reservoir, powerhouse, penstocks, and a 1.24-mile-long bypassed reach on the West Fork of the Tuckasegee River. The project boundary around the two reservoirs is located at contour elevation 10 feet above the maximum pool elevation. Because the land surrounding the reservoirs is generally steep, there is very little shoreline in the boundary. The maximum pool

elevation of Lake Glenville is 3,491.7 feet msl and Tuckasegee Lake is 2,278.75 feet msl. Duke proposes no change to the project boundary.

E. Current Project Operation

18. The West Fork Project generates an average of 95,474 megawatt hours (MWh) of energy annually. As licensed, Duke operates the Glenville and Tuckasegee developments to meet generation needs and provide for limited flood control. Although not required by the license, on a daily basis the reservoirs are maintained within an operating range above or below a target elevation which changes throughout the year.[15] Currently, Lake Glenville is drawn down to its lowest target elevation from November to January and is refilled to its highest target elevation from May through July. At the Tuckasegee development, Tuckasegee Lake is held at a near constant elevation year-round due to its limited storage capacity. The Tuckasegee powerhouse operates whenever the Glenville unit is operating or if there is a flow release from the Glenville spillway.

19. Under normal flow and water conditions, the generating units are operated as peaking units, generating for a number of hours per day. Under high flow conditions, the generating units operate 24 hours per day. Daily flow releases are based on estimated inflows, established operating ranges for the lake levels, and system load and voltage support needs. Although not required by the current license, the Glenville and Tuckasegee powerhouses release water for angling and boating during the recreation season. This typically involves the operation of the powerhouses between 12 p.m. and 4 a.m. to allow travel time for the flows to reach the desired section of the Tuckasegee River. [16]

F. Relicensing Proposal

20. Duke proposes no new capacity for the project. Duke proposes to operate the West Fork Project according to the terms of the Tuckasegee agreement, which contains

[15] In 2004, Duke voluntarily implemented the operation rule curves for the Glenville and Tuckasegee developments as proposed in the license application. The operation rule curves required no change in the historic operation of the Tuckasegee development (Tuckasegee Lake), and a higher target elevation in the spring and fall at the Glenville development (Lake Glenville). The details of the rule curves are specified in Article 401 of this license.

[16] *See* EA at 16 and 235.

proposed license articles[17] with measures for the protection, mitigation, and enhancement of resources affected by the project.[18]

21. As provided in Section 1.0 of the Tuckasegee agreement, Duke proposes to establish as license requirements the reservoir levels and operating ranges for Lake Glenville that it has been voluntarily implementing, including operating ranges during the primary angling period and the primary boating period.[19] The operating ranges will vary (from four feet to nine feet) depending on the month of the year. The minimum reservoir level will vary from 85 feet[20] (from December 1 to March 1) to 95 feet (from May 1 to July 1). Maximum reservoir levels will be between 94 feet (September 1 to March 1) and 99 feet, depending on the month of the year.

22. Section 1.0 includes a proposed license article that incorporates by reference Attachment B (Low Inflow Protocol) and Attachment C (Hydro Project Maintenance & Emergency Protocol) of the Tuckasegee agreement. The Low Inflow Protocol includes measures for flow reductions during drought or reduced water conditions. The Hydro Project Maintenance & Emergency Protocol includes measures to operate the West Fork Project under various emergency and equipment failure and maintenance situations.

23. Duke proposes several recreation measures, as provided in Sections 2.0, 3.0, and 5.0 of the Tuckasegee agreement. Duke proposes to continue to provide for the operation and maintenance of three existing project recreation sites, to make a number of improvements to these recreation sites, and to provide additional access sites (to the bypassed reach and the reservoir).[21] Duke also proposes to continue to provide public

[17] For convenience, the 400-series articles required in this license follow the numbering of the proposed articles in the Tuckasegee agreement.

[18] The agreement also specifies off license procedures to be used by the signatories to ensure the implementation of the measures.

[19] The "primary angling period" is the first weekend after Labor Day through the last weekend of October, and April 1 through the first weekend of June. The "primary boating period" is after the first weekend of June through Labor Day.

[20] These elevations are relative to the top of the dam, with 100.0 feet being the Normal Full Pond Elevation.

[21] Tuckasegee agreement, Section 2.0. Duke also proposes to provide funding to assist in the development of other non-project recreation facilities (through off-license agreements).

information on reservoir levels and flows for angling and whitewater boating on its website and its telephone system, and a link on its website to a suitable USGS gage on the Tuckasegee River to provide information on river flows.[22]

24. As discussed in more detail later in this order, Duke proposes,[23] in coordination with its East Fork Project No. 2698, to make additional releases from the two projects during the primary angling period and boating period to enhance angling and boating in the mainstem Tuckasegee River downstream of the East and West Fork Projects. Target flows during the primary angling periods, as measured near the Dillsboro gage, would be equal to or less than 500 cfs. Target flows during the primary boating period, also as measured near the Dillsboro gage, would be 800 cfs.

25. In addition, Duke proposes[24] to provide releases for whitewater boating in the 6.43-mile-long West Fork (Glenville) Tuckasegee bypassed reach. Duke would make these releases from Glenville dam, to measure 250 cfs at the boat put-in that Duke proposes to develop under the new license, on seven weekend days between April 1 and September 30. Duke proposes to meet with interested entities after five full recreation seasons to evaluate the recreation flows (i.e., boating, angling, and whitewater).

26. In addition, as provided in the Tuckasegee agreement, Duke proposes to reimburse the USGS on an annual basis for its cost to maintain a USGS gage near RM 31.0 (Section 3.0) and provide year-round minimum flow releases of 20 cfs from Tuckasegee dam into the bypassed reach of West Fork of the Tuckasegee River (Section 4.0).

27. As provided in the Tuckasegee agreement, Duke also proposes measures for: shoreline management (Section 7.0); cultural resources (Section 8.0); sediment management (Section 9.0); escalating costs or payment amounts to current year dollars (Section 10.0); [25] and an annual report for the resource agencies on compliance monitoring and reporting requirements (Section 14.0).

---

[22] *Id.*, Section 3.0.

[23] *Id.*, Section 5.0.

[24] *Id.*

[25] Section 10 provides for a monetary value agreement, identified as proposed Article 410. The monetary value agreement is a means of handling the monetary values identified in the Tuckasegee agreement. Because proposed Article 410 is not necessary to satisfy any project purposes, I am not requiring it as a part of the license, and therefore,

28. Other sections of the Tuckasegee agreement include agreements among the signatories that are not intended to be incorporated into a new license for the project.[26]

29. In the EA,[27] staff recommended adopting most of the proposed license articles of the Tuckasegee agreement, with the exception of providing funds and reimbursements to various entities for measures not tied to effects associated with the West Fork Project. As explained in more detail below, I agree with staff recommendations and the recommended measures are included as conditions of the West Fork Project license.

WATER QUALITY CERTIFICATION

30. Under section 401(a)(1) of the Clean Water Act (CWA),[28] the Commission may not issue a license authorizing the construction or operation of a hydroelectric project unless the state water quality certifying agency either has issued water quality certification for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed one year. Section 401(d) of the CWA provides that the certification shall become a condition of any federal license that authorizes construction or operation of the project.[29]

31. On January 12, 2004, Duke applied to the North Carolina DENR, Division of Water Quality (North Carolina DWQ) for water quality certification for the West Fork Project. Each year since that date, Duke has withdrawn and refiled its application. On December 7, 2009, Duke refiled its application. The North Carolina DWQ received the last request on December 8, 2009. On July 30, 2010,[30] North Carolina DWQ issued a

---

it is intentionally left blank herein.

[26] Sections 12.0, 13.0, and 15.0 through 17.0 do not contain proposed articles and are thus intended to not be requirements of the license. *See* License Application, filed January 26, 2004, Vol. IV, TCST Settlement Agreement, pages 31 and 32, and pages 34 through 37.

[27] *See* EA at 315-29.

[28] 33 U.S.C. § 1341(a)(1) (2006).

[29] 33 U.S.C. § 1341(d) (2006).

[30] On June 15, 2010, North Carolina DWQ issued certification for the West Fork Project that included nine conditions. However, that certification was superseded by the

revised certification for the project that included six conditions, which are set forth in Appendix A of this order and incorporated into the license (*see* Ordering Paragraph D).

32. The certification includes: (1) requirement to implement best management practices for waste, spoil, solids, or fill within wetlands, waters, or riparian areas; (2) measures regarding sediment and erosion control in wetlands or waters; (3) requirement to identify and report to the North Carolina DWQ and the North Carolina Division of Water Resources (North Carolina DWR) existing and proposed consumptive uses of West Fork Project waters; (4) statement that the certification does not grant or affirm any property right or any right of use in any waters; (5) requirement to maintain compliance with State water quality standards; and (6) incorporation by reference of the Tuckasegee agreement, specifically, Sections 1.0 (Reservoir Level), 4.0 (Minimum Flow), 9.0 (Sediment Management), 14.0 (Compliance Monitoring & Reporting), Attachment B (Low Inflow Protocol), and Attachment C (Hydro Project Maintenance & Emergency Protocol).

33. The Tuckasegee agreement consists of draft license articles regarding the above-noted reservoir level, minimum flow, and sediment management measures. They are clarified in certain respects and included in this license as 400-series articles. The Low Inflow Protocol and the Hydro Project Maintenance & Emergency Protocol are attached to the certification in Appendix A.

COASTAL ZONE MANAGEMENT ACT

34. Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA),[31] the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification.

35. North Carolina DENR, Division of Coastal Management, manages North Carolina's Coastal Zone Management Program. North Carolina's coastal zone includes 20 counties that in whole, or in part, are adjacent to, adjoining, intersected by, or bounded by the Atlantic Ocean or any coastal sound(s).

July 30, 2010 certification.

[31] 16 U.S.C. § 1456(c)(3)(A) (2006).

36. Pursuant to the National Oceanic and Atmospheric Administration's regulations implementing the CZMA, 15 C.F.R. § 930.53 (2010), if a state chooses to review activities, with reasonably foreseeable effects, outside its coastal zone, it must generally describe the geographic location of such activities. If a state wishes to review activities outside of the coastal zone, and for which it has not generally described the geographic location for review, the state must follow the procedures established in 15 C.F.R. § 930.54 (2010). That section requires the state to notify the federal agency, the applicant, and the National Oceanic and Atmospheric Administration of unlisted activities affecting the coastal zone (that it wishes to review) within 30 days from notice of the license application.[32]

37. The West Fork Project is located outside North Carolina's coastal zone, and North Carolina has not described a geographic location for federal license activities outside the coastal zone that it wishes to review. Notice of the license application was published in the *Federal Register* on June 10, 2004. In addition, North Carolina DENR was provided with a copy of the May 2006 draft EA and the July 2006 final EA. The agency did not notify the Commission or the applicant that it wished to review the application. Therefore, certification is not required.

SECTION 18 FISHWAY PRESCRIPTIONS

38. Section 18 of the FPA[33] provides that the Commission shall require the construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate.

39. On March 16, 2005, the Secretary of the Interior requested that the Commission reserve authority to prescribe fishways at the West Fork Project in the future. Consistent with Commission policy, Article 413 of this license reserves the Commission's authority to require fishways that may be prescribed by the Secretary of the Interior for the West Fork Project.

THREATENED AND ENDANGERED SPECIES

40. Section 7(a)(2) of the Endangered Species Act (ESA) of 1973[34] requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of

---

[32] Notice may be constructive, if it is published in the *Federal Register*. 15 C.F.R. § 930.54(a)(2) (2010).

[33] 16 U.S.C. § 811 (2006).

federally listed threatened and endangered species, or result in the destruction or adverse modification of designated critical habitat.

41. There are two federally listed species with the potential to occur in the project area: the endangered Indiana bat (*Myotis sodalis*) and the endangered Appalachian elktoe mussel (*Alasmidonta raveneliana*). Designated critical habitat for the Appalachian elktoe mussel also exists in the project area. In the draft EA, staff analyzed project-related effects on the endangered Indiana bat and the endangered Appalachian elktoe mussel.[35]

42. On May 17, 2006, the Commission issued a letter to the FWS requesting concurrence with a determination that the proposed relicensing of the West Fork Project is not likely to adversely affect the Indiana bat or the Appalachian elktoe mussel. On June 8, 2006, FWS notified staff at a public meeting that it anticipated the need for formal consultation with the Commission to adequately satisfy the requirements of section 7 of the ESA, especially for the Appalachian elktoe mussel. In the final EA, staff acknowledged FWS's conclusion regarding the need for formal consultation for the Appalachian elktoe mussel.[36]

43. On August 12, 2006, the FWS filed a biological opinion with its determinations. The FWS stated that the Indiana bat was not located near the project during surveys and therefore, based on the project description and location, concluded that no impacts to the Indiana bat would occur from relicensing the West Fork Project. The requirements under section 7 of the ESA are fulfilled with regard to this species. Also in its biological opinion, the FWS concluded that relicensing the West Fork Project is not likely to jeopardize the continued existence of the Appalachian elktoe mussel. Critical habitat will not be adversely affected or destroyed by relicensing this project as proposed. The biological opinion includes an incidental take statement with reasonable and prudent measures and terms and conditions to minimize take of listed Appalachian elktoe mussel. However, the terms and conditions apply to other projects in the river basin and not to the West Fork Project; therefore, it is not included here.

---

[34] 16 U.S.C. § 1536(a) (2006).

[35] *See* draft EA at 177-84.

[36] *See* final EA at 185-95.

NATIONAL HISTORIC PRESERVATION ACT

44. Under section 106 of the National Historic Preservation Act (NHPA)[37] and its implementing regulations,[38] federal agencies must take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register of Historic Places (defined as historic properties) and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking. This generally requires the Commission to consult with the State Historic Preservation Officer (SHPO) to determine whether and how a proposed action may affect historic properties, and to seek ways to avoid or minimize any adverse effects.

45. To satisfy these responsibilities, the Commission executed a Programmatic Agreement (PA) with the North Carolina SHPO and invited Duke, the Eastern Band of Cherokee Indians,[39] Jackson County, Dillsboro Inn, the Town of Franklin, and Macon County to concur with the stipulations of the PA. Duke and the Eastern Band of Cherokee Indians concurred. The PA requires the licensee to implement its Historic Properties Management Plan (HPMP) for the term of any license issued for this project. Duke's "Historic Properties Management Plan, West Fork Hydroelectric Project No. 2686-032" filed August 7, 2006, is approved in Ordering Paragraph E. Execution of the PA demonstrates the Commission's compliance with section 106 of the NHPA. Article 414 requires the licensee to implement the PA and its approved HPMP.

RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES PURSUANT TO SECTION 10(j) OF THE FPA

46. Section 10(j)(1) of the FPA[40] requires the Commission, when issuing a license, to include conditions based on recommendations by federal and state fish and wildlife

---

[37] 16 U.S.C. § 470 *et seq*. (2006).

[38] 36 C.F.R. Part 800 (2010).

[39] The Eastern Band of Cherokee Indians is a federally-recognized tribe. While the project is not located on tribal land, the tribe expressed an interest in reviewing cultural resources reports and working with Duke to develop and implement the HPMP.

[40] 16 U.S.C. § 803(j)(1) (2006).

agencies submitted pursuant to the Fish and Wildlife Coordination Act,[41] to "adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)" affected by the project.

47. In response to the January 21, 2005 public notice that the project was ready for environmental analysis, Interior [42] filed 13 recommendations under section 10(j).[43] Eight recommendations were determined to be outside the scope of section 10(j) and are discussed in the next section. This license includes the following conditions consistent with the remaining five recommendations that are within the scope of section 10(j): (1) manage reservoir levels within the agreed normal operating range, release a monthly flow, implement reservoir elevation levels, and adhere to the Low Flow Protocol and the Hydro Project Maintenance & Emergency Protocol during temporary variance (Article 401); (2) provide a minimum flow of 20 cfs from Tuckasegee Lake into the West Fork of the Tuckasegee River and calibrate the existing staff gage located just upstream of the Tuckasegee powerhouse tailrace (Article 404); (3) operate the project reservoirs in accordance with the Low Inflow Protocol during periods of low flow (Appendix A); (4) operate the project reservoirs in accordance with the Hydro Project Maintenance & Emergency Protocol during emergency and equipment failure and maintenance situations (Appendix A); and (5) develop, after consultation with North Carolina WRC, North Carolina DWR, North Carolina DWQ, and FWS, a Woody Debris Management Plan to continue to pass woody debris downstream (Article 412).

SECTION 10(a)(1) OF THE FPA

48. Section 10(a)(1) of the FPA[44] requires that any project for which the Commission issues a license shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce; for the improvement and utilization of waterpower development; for the

[41] 16 U.S.C. §§ 661 *et seq*. (2006).

[42] *See* Interior filing of March 11, 2005.

[43] On March 17 and March 21, 2005, respectively, North Carolina DENR and North Carolina WRC stated the conditions contained in the Tuckasegee agreement encompass the resource agencies' recommendations under section 10(j) of the FPA. The measures contained in the Tuckasegee agreement are addressed in this section and the next section.

[44] 16 U.S.C. § 803(a)(1) (2006).

adequate protection, mitigation, and enhancement of fish and wildlife; and for other beneficial public uses, including irrigation, flood control, water supply, recreation, and other purposes.

49. Interior made eight recommendations under section 10(j) that are not specific measures to protect, mitigate damages to, or enhance fish and wildlife. Consequently, I do not consider these recommendations under section 10(j) of the FPA. Instead, I consider these recommendations under the broad public interest standard of section 10(a)(1) of the FPA.

50. The community commenters made 14 recommendations in its community proposal, including a license term for the West Fork Project not to exceed 40 years. Except for the license term, I consider these recommendations in this section. The license term is discussed separately.

A. Sediment Management

51. Interior recommended Duke operate the West Fork Project to minimize the need to draw the reservoirs down to mechanically remove sediment. Further, Interior recommended when sediment must be mechanically removed, or the reservoirs must be drawn down to remove sediment, Duke consult with the FWS and the resource agencies concerning reasonable and necessary measures to minimize the effects of the drawdown and sediment removal on the environment.

52. In the EA,[45] staff found that if it should become necessary for Duke to drawdown the reservoirs for maintenance purposes lower than their routine annual drawdown, sediment in the drawdown zone could be subject to erosion and resuspension. Staff, therefore, recommended adopting Interior's recommendations. Since the certification requires a Sediment Management Plan, I am requiring Duke to include additional provisions in the plan, such as a dredging and a sediment removal schedule. Article 409 requires the plan with these additions.

53. The community commenters recommended Duke develop a sediment removal plan for the West Fork Project which includes dredging the West Fork Project reservoirs within one year of license issuance and every five years thereafter. The community commenters also recommended Duke move to off-site locations 75 percent of the sediment removed from the project reservoirs.

[45] *See* EA at 377.

54. The EA[46] does not recommend adopting the community commenters' recommendations. In the EA,[47] staff determined that the need for sediment removal is unlikely from the West Fork Project reservoirs because the depths of the reservoirs would accommodate a substantial amount of sediment from upstream sources without the need for remedial action (such as dredging). In addition, the forested watershed minimizes erosion and related sediment input to the reservoirs. Further, in the EA, staff concluded that dredging is not required to maintain the existing operation of the West Fork Project, and dredging would increase the sediment trapping ability of the dams.[48] Therefore, I am not requiring the licensee to regularly remove sediment as requested by the community commenters, but as stated above I am requiring a sediment management plan should sediment need to be mechanically removed.

B. Recreation Flow Releases

55. Duke proposed, and North Carolina DENR recommended, providing scheduled recreation flow releases as set forth in the Tuckasegee agreement and included as a provision of the certification. The recreation releases from the East and West Fork Projects would be coordinated to provide specified target flows in the mainstem Tuckasegee River during both the primary angling period and the primary boating period, thus enhancing angling and boating in the mainstem Tuckasegee River.[49] The recreation flow release schedules are described in the certification's Low Inflow Protocol (Appendix A). The protocol does not specify the amount of flows to be released from each project in order to meet the 500-cfs target for the primary angling period. The 800-cfs for the primary boating period, on the other hand, will be met by each project on certain days of the week. The combined releases from the two projects would provide

[46] *Id.* at 301.

[47] *Id*. at 79.

[48] *Id.* at 80.

[49] The EA (pages 263-65) notes that a Tuckasegee River Angling Flow Study was conducted during the relicensing process, which assessed five river segments located in the East Fork Project and the West Fork Project areas, of which three river segments were located on the main stem of the Tuckasegee River, downstream of both projects. The study concluded that Duke's proposed flow schedule created additional pools for shoreline fishing and improved boat fishing.

flows daily for the primary angling period and flows daily for the primary boating period, except for holidays.[50]

56. Under the certification's Hydro Project Maintenance & Emergency Protocol (Appendix A), Duke is required to coordinate between the East and West Fork Projects to make appropriate changes in flows from one or both projects in the event of scheduled or unscheduled outages at either project. Duke would provide replacement flows from the East Fork Project if it could not avoid scheduling outages during the recreation season at the West Fork Project.[51] Article 405 requires Duke to release flows from the West Fork Project adequate to maintain the recreation flows in the mainstem Tuckasegee River as required in the certification.

57. The certification also requires Duke to release 250 cfs into the 6.43-mile-long West Fork (Glenville) bypassed reach, using a Tainter gate at Glenville dam. The release would primarily enhance whitewater boating in the bypassed reach. However, releases from the Tainter gate may increase water temperature and displace fish; therefore, staff recommended a fishery monitoring plan to monitor the fishery in the bypassed reach during the whitewater flow releases.[52] Article 406 requires Duke to release 250 cfs for whitewater boating and requires Duke to develop and implement a fishery monitoring plan to monitor the existing fishery in the bypassed reach during the whitewater flow releases.

C. U.S. Geological Survey Stream Gage Maintenance

58. In the EA,[53] staff noted that USGS Gage No. 03508000 at Tuckasegee and USGS Gage No. 03510500 at Dillsboro have been replaced by other gages,[54] thus are no longer

---

[50] The exception would be Memorial Day Monday, when angling releases would be made from the West Fork Project, and Labor Day Monday, when boating releases would be made from the East Fork Project.

[51] For example, if the Tuckasegee or Glenville developments were out of service then Duke would provide recreation flow releases from a Tainter gate at the East Fork Cedar Cliff dam.

[52] *See* EA at 363.

[53] *Id.* at 385.

[54] The USGS Gage No. 03508000 at Tuckasegee was replaced in 2004 by USGS Gage No. 03508050 located approximately 2 miles downstream at Cullowhee on the East

active. The Tuckasegee gage measured flows on the East Fork of the Tuckasegee River and the Dillsboro gage measured flows on the main stem of the Tuckasegee River. Interior recommended Duke reimburse the USGS annually for its cost to maintain the Tuckasegee gage. Since the Tuckasegee gage is no longer operable, I am not requiring reimbursement. However gages are needed in the vicinity of the deactivated Tuckasegee gage and in the vicinity of the deactivated Dillsboro gage to monitor compliance with the recreation flow requirements in Article 405. Article 404 requires Duke develop a minimum flow and flow monitoring plan, which includes monitoring flows on the West Fork of the Tuckasegee River and identifying suitable replacement gages for the deactivated Dillsboro gage.

D. Annual Compliance Report

59. Interior recommended Duke provide to the FWS and other resource agencies an annual report containing (1) a table of elevations of Lake Glenville on a daily basis during the previous calendar year and (2) documentation that the minimum flow releases were met during the previous calendar year. In the EA,[55] staff recommended adopting Interior's recommendation with a report to be filed no later than May 31 of each year as provided by the Tuckasegee agreement. I find that documenting compliance with project operations is appropriate. Therefore, Article 411 requires Duke to implement a compliance monitoring program, including development of an annual report, for the West Fork Project, to be filed with the Commission by May 31 of each year.

E. Recreation Measures

1. Funds to Improve Recreation Facilities

60. Interior recommended Duke construct a wildlife viewing platform at Lake Glenville provided the cost does not exceed $5,000 and the parties agree that the wildlife viewing platform is needed. The EA[56] notes Duke's proposal to construct wildlife viewing platforms. Although staff recommended adopting the recommendation, it is

---

Fork of the Tuckasegee River. The USGS Gage No. 03510500 at Dillsboro was replaced in 2004 by USGS Gage No. 03510577 located approximately 4 miles downstream at Barker's Creek, on the main stem Tuckasegee River.

[55] *See* EA at 316.

[56] *Id.* at 322.

difficult to ascertain the location of the wildlife viewing platforms relative to the existing West Fork Project boundary. Therefore, I am including in Article 402 a provision for Duke to include in its Recreation Plan a wildlife viewing platform within the West Fork Project boundary because the measure would enhance recreation resources at the project.

61. Duke proposes, and the Tuckasegee agreement provides for, improvements to Duke's existing three project recreation sites. These sites are: (1) the Powerhouse (or Low Water) Public Boat Access Area that has a boat ramp, a dock, and parking for approximately 30 to 45 vehicles; (2) the Pine Creek Public Boat Access Area that has three concrete ramps for boat access, a single boat ramp and one double ramp, a dock, and parking for approximately 40 to 50 vehicles; and (3) the Pines Day-Use Area that has picnic tables and parking for up to six vehicles. Therefore, Article 402 requires Duke to develop and implement a Recreation Plan for Duke's three existing project recreation sites, including new recreation measures. The new recreation measures include barrier-free docks, bank fishing areas with trails, a swimming area, parking, installation of lighting to minimize effects on fish and wildlife resources, and an approximate 1.5-mile-long trail on Duke-owned land from Glenville dam to below High Falls and a parking area for 5 vehicles.

62. In the EA,[57] staff found Duke's proposal to continue to provide public information on reservoir levels and flows for angling and boating on its website and its telephone system, and a link on its website to a suitable USGS gage on the Tuckasegee River to provide information on river flows would benefit the public. Therefore, Article 403 requires Duke to continue to provide public information at the West Fork Project.

2. Annual Meetings

63. North Carolina DENR recommended Duke schedule an annual meeting with the resource agencies to discuss the recreation flow schedule for whitewater boating and schedule an additional meeting to evaluate the flows after 5 years of releases. In the EA,[58] staff recommended adopting North Carolina DENR's recommendation for annual meetings.

---

[57] *Id*. at 255-56.

[58] *Id.* at 262. Staff notes that Duke, in 2004, convened the first annual meeting with the parties, and has continued the annual meetings thereafter.

64. Duke's proposal to continue to convene periodic meetings to discuss the recreation flow schedule for whitewater boating in the 6.43-mile-long West Fork (Glenville) bypassed reach and to evaluate the flows after 5 years of releases would provide Duke and the resource agencies with the information necessary to recommend adjusting, if necessary, flows for boating, as well as coordinate the various aspects of the Tuckasegee agreement. Because Duke and the parties are free to convene periodic meetings I find the Commission does not need to be notified. The Commission, however, should be notified of and approve any such modifications, if proposed. Article 407 requires Commission approval of any modifications to the recreation flows prior to implementation.

F. Shoreline Management Plan

65. Duke, as part of its license application, filed its draft Project Reservoir and Land Management Plan with Shoreline Management Guidelines that include provisions for eight projects, including Bryson, Dillsboro,[59] Franklin, Mission, East Fork, West Fork, Nantahala projects, as well as the Queens Creek Project No. 2694.[60] The Shoreline Management Guidelines also are attached to the Tuckasegee agreement. The plan and guidelines establish a framework to protect the environmental resources at the projects, and enhance public access to the projects' lands and waters.

66. Interior recommended Duke implement its Shoreline Management Guidelines as drafted. In the EA,[61] staff recommended adopting Interior's recommendation. However, staff noted the Shoreline Management Guidelines address all of the above projects, and recommended Duke develop and implement a separate Shoreline Management Plan for each of its projects, including the West Fork Project. Article 408 requires Duke to develop and implement a Shoreline Management Plan that incorporates the provisions of Duke's Shoreline Management Guidelines that specifically pertain to the West Fork Project.

G. Funding Contribution for the Sicklefin Redhorse

67. Interior recommended Duke provide a one-time funding contribution of at least $40,000, in-kind services, or a combination of the two, to support the FWS and North

[59] 120 FERC ¶ 61,054 (2007).

[60] 98 FERC ¶ 62,214 (2002).

[61] *See* EA at 356.

Carolina WRC studies to determine the habitat, movement, ecology, and distribution of the sicklefin redhorse, a freshwater fish species, in the Little Tennessee, Hiwassee, and Tuckasegee Rivers.

68. The funding for sicklefin redhorse and other riverine fishes could be beneficial to aquatic resources as a whole, and enhance sicklefin redhorse research within the Little Tennessee watershed; however, the measure does not specify project or specific locations where such a study would occur. In the EA,[62] staff concluded that neither life history characteristics nor habitat requirements specific to the sicklefin redhorse have been identified within the West Fork Project area. Nor has Interior explained how this species is related to project purposes or project effects. Therefore, I am not adopting Interior's recommendation.[63] Duke is of course free to enter into any off-license agreement for this measure.

H. Fish Stocking Program

69. The community commenters recommended Duke develop and implement an annual fish stocking program for the project's reservoirs under the direction of North Carolina WRC and after consultation with Jackson County. Friends of Lake Glenville commented that fish stocking in Lake Glenville should be developed under the direction of the North Carolina WRC. In the EA,[64] staff does not recommend Duke stock fish in the West Fork Project reservoirs because of their limited capacity to sustain a fishery and their low recreational fishing use. The EA noted that there are nearby fishing areas that offer alternative fishing sites to anglers. I agree with staff findings, and therefore, I am not requiring a fish stocking program as part of the license.

I. Riparian Habitat Enhancement Fund

---

[62] *Id.* at 143-44.

[63] In any event, the Commission is concerned with protecting resources through specific measures enforceable as to the licensee, rather than requiring a licensee to provide funding to another entity, because the Commission would have no way of assuring that the activity paid for by the licensee would actually serve a project purpose or ameliorate a project effect. *See Settlements in Hydropower Licensing Proceedings Under Part I of the Federal Power Act*, 116 FERC ¶ 61,270, at P 24 (2006). *See Avista Corporation*, 127 FERC ¶ 61,265, at P 196 (2009); *Public Utility District No. 2 of Grant County, Washington*, 123 FERC ¶ 61,049, at P 79 (2008).

[64] *See* EA at 251-52.

70. Interior recommended Duke establish a riparian habitat enhancement fund, in the amount of $200,000, to address what it alleges are unavoidable ongoing and cumulative impacts of the operation of the West Fork Project on riparian habitats. However, in the EA, staff concluded that there was no evidence that the project had an adverse effect on riparian habitat. [65] Therefore, I am not requiring riparian habitat enhancement measures as part of the license.[66] Duke is of course free to carry out this settlement provision outside the license.

J. Funds for Jackson County

71. The community commenters ask that the Commission require Duke to provide the following funds to Jackson County: (1) $80,000 for resources the county asserts it spent in participating in the Commission consultation process, and additional payments every 5 years of $40,000; (2) $150,000 to the Jackson County Soil and Water Conservation District for the improvement of soil and water conservation programs; (3) $350,000 to Jackson County for any Duke project located in the county and thereafter, $5,000 per year for each MW of the authorized capacity for projects located in the county; (4) $50,000 annually for equipment and training for emergency personnel; and (5) an amount to be negotiated for the purpose of reimbursing the county for providing emergency rescue services associated with the public use of recreation facilities not owned by Jackson County.

72. The Commission does not require its licensees to compensate local jurisdictions for such costs. Indeed, these requested payments appear to be a type of tax for operating the project within the boundary of the county. However, as the Commission has explained, it is not a taxing authority, and such matters must be left to state and local jurisdictions.[67] Nor does the Commission require licensees to undertake obligations, such as county soil and conservation programs, that have no demonstrated relationship to the project and do not fulfill a project purpose. As to funding for emergency personnel and the public's use of their services, the Commission has rejected such proposals, as the Commission is concerned with protecting resources and uses at the project rather than funding personnel.

---

[65] *Id.* at 180.

[66] See n. 63, *supra*.

[67] *See, e.g., Appalachian Power Company*, 132 FERC ¶ 61,236 at P 63 (2010).

73. For the above reasons, this license does not require the payments to Jackson County requested by the community commenters.

K. Woody Debris Along the Shoreline

74. Friends of Lake Glenville commented on the potential safety hazards created by insufficient maintenance of vegetation along the shoreline. In particular, Friends of Lake Glenville stated that Duke's vegetation management plan limits the removal of vegetation and woody debris along the shoreline.

75. Article 20, which is included in the Standard L-Form attached to this license, requires Duke to clear and keep clear, to an adequate width, lands along open conduits and to dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, the article requires Duke to remove all trees along the periphery of project reservoirs, which may die during project operation. Therefore, I am not requiring Duke to provide any additional measures in its vegetation management plan.

L. Shoreline Lease Program

76. Friends of Lake Glenville ask that the Commission require Duke to re-establish the shoreline lease program that Duke terminated with filing of its license application. The referenced shoreline lease program was administered by the former licensee, Nantahala Power and Light, and made part of the 1997 Shoreline Management Plan filed with the Commission on September 16, 1997.[68] The shoreline lease program provided for adjacent landowners to apply for a shoreline lease to lease property between their property line and the lake level of the reservoir, except for areas reserved for public recreation and restricted areas.

77. As stated above, Duke developed Shoreline Management Guidelines that are part of the Tuckasegee agreement. With the development of the Shoreline Management Guidelines, Duke terminated the shoreline lease program because it led to the inappropriate use of shoreline areas.[69] The EA addressed Friends of Lake Glenville's

[68] By letter dated October 10, 1997, the Commission stated that the Lake and Shoreline Management Plan was consistent with the licenses for the East Fork Project, West Fork Project, and Nantahala Project, and did not need Commission approval prior to implementation.

[69] *See* EA at 204.

assertion that the shoreline lease program eliminated some of the security and nuisance issues resulting from public use at Lake Glenville by pointing out that Duke cooperates with the Jackson County sheriff to promote public safety and law enforcement at Lake Glenville.

78. In reply comments, American Whitewater stated that project lands and waters are to be used for project purposes and public recreation, and not to be governed by adjacent landowners.

79. As a general policy, the interests of private property owners are not allowed to override the public's use and enjoyment of project lands and waters. Article 408 requires Duke to develop and implement a Shoreline Management Plan that incorporates the provisions of Duke's Shoreline Management Guidelines that specifically pertain to the West Fork Project. The Shoreline Management Plan will guide Duke in its management of the West Fork Project lands and waters, including public use. For reasons stated above, I am not requiring a shoreline lease program to be part of the license.

80. In a related matter, Friends of Lake Glenville commented that the Exhibit G drawings do not support the width of the buffer at Lake Glenville to be at least 20 to 50 feet from the water's edge because the lake is narrow and irregular, and the drawings are not clear regarding the West Fork Project boundary. Friends of Lake Glenville commented that the project boundary at Lake Glenville should be better defined, thereby eliminating confusion between public and private use of lands.

81. A licensee's project boundary must enclose only those lands that are necessary for the safe and efficient operation and maintenance of the project, and for other specified project purposes, such as public recreation or protection of environmental resources. As discussed in this order, *infra*, the Exhibit G drawings filed as part of the application for license do not conform to Commission regulations and are not approved. This license requires Duke to file revised Exhibit G drawings that will clearly identify the project boundary.

M. Allocation of Resources

82. Friends of Lake Glenville assert that the EA fails to address the disproportionate allocation of resources involving funds for the Jackson County Andrews Park and costs to release flows for whitewater boating into the 6.43-mile-long West Fork (Glenville) bypassed reach. Friends of Lake Glenville commented that the estimated cost of $100,000 for Duke to construct a trail that would provide access for a small number of highly skilled whitewater boaters to the bypassed reach should be allocated for Andrews Park, which would reach a broader spectrum of the public.

83. In reply comments, American Whitewater stated that the operation of the West Fork Project de-waters a highly desired whitewater river. Releasing flows into the bypassed reach, as set forth in the Tuckasegee agreement and included as a condition of the certification, would restore 7 days of whitewater boating on the West Fork of the Tuckasegee River. Additionally, American Whitewater commented that Duke proposed to enhance recreation resources at the project at an estimated cost of $396,000, and provide $350,000 to Jackson County for Andrews Park and other county projects, totaling $746,000 for Jackson County. American Whitewater commented that, in contrast, construction of the trail would cost an estimated $100,000.

84. Staff determined that Andrews Park is not tied to project purposes or project effects, and therefore, did not recommend measures for the park.[70] Regardless of the allocation of resources, the Commission made clear that measures required in a license be clearly tied to the project at issue.[71] Therefore, this license does not require the measures for Andrews Park requested by Friends of Lake Glenville.

N. Delay the Release of Recreation Flows

85. The community commenters and Friends of Lake Glenville ask the Commission to delay requiring the release of flows into the West Fork bypassed reach for whitewater boating at least 10 years, and then only if certain conditions are met, such as boaters can participate in the recreational activity without trespassing on or over non-project lands.

86. As stated above, the interests of private property owners are not allowed to override the public's use and enjoyment of project lands and waters. Therefore, I am not requiring Duke to delay the release of whitewater flows. Article 405 requires Duke to operate the West Fork Project to provide flow releases for angling and boating.

O. Project Operation

87. This license requires, in Article 401, that Duke maintain Tuckasegee Lake at a constant elevation of approximately 2,276.5 feet USGS annually, and maintain Lake Glenville, to the extent practicable, at a target elevation and keep deviations from the target within a normal operating range, except during droughts or emergency situations.

---

[70] *Id.* at 367.

[71] *See Settlements in Hydropower Licensing Proceedings Under Part I of the Federal Power Act*, 116 FERC ¶ 61,270 (2006).

A Low Inflow Protocol would guide project operation during droughts, and a Hydro Project Maintenance & Emergency Protocol would guide operations during emergencies. This license requires, in Article 404, a 20 cfs year-round minimum flow from Tuckasegee dam. Article 404 requires a plan to monitor this flow release as well as the recreation flows required in Article 405, and the whitewater boating flows required in Article 406.

88. Operating the project within the normal operating range would provide adequate protection of fish and other aquatic organisms that rely on near-shore habitat for feeding, spawning, and cover, as well as aquatic vegetation beds near the shoreline. Providing a 20 cfs year-round minimum flow from Tuckasegee dam would ensure that the project tailrace would not be de-watered, when the project is not generating, thereby protecting aquatic habitat. Project operation could be assured by including additional detail and descriptions of the mechanisms and protocols to be used to gather and report compliance monitoring data. A compliance report is required in Article 411, which is discussed in item D above (Annual Compliance Report). Further, Articles 401, 404, and 411 are consistent with the conditions of the certification.

ADMINISTRATIVE PROVISIONS

A. Annual Charges

89. The Commission collects annual charges from licensees for administration of the FPA. Article 201 provides for the collection of funds for administration of the FPA.

B. Exhibit F and G drawings

90. The Commission requires licensees to file sets of approved project drawings on microfilm and in electronic file format. Article 202 requires the filing of the approved Exhibit F drawings in those formats. The Exhibit G drawings filed with the license application and the revised Exhibit G drawings filed October 29, 2004, do not show the existing and proposed recreation facilities within the project boundary. The Exhibit G drawings must show all approved project features; therefore, I am not approving the project boundary drawings. Article 203 requires Duke to file revised Exhibit G drawings pursuant to §§ 4.39 and 4.41 of the Commission's regulations.

C. Amortization Reserve

91. The Commission requires licensees for new major licenses to set up and maintain an amortization reserve account upon license issuance. Article 204 requires the establishment of the account.

D. Headwater Benefits

92. Some projects directly benefit from headwater improvements that were constructed by other licensees, the United States, or permittees. Article 205 requires the licensee to reimburse such entities for these benefits if they were not previously assessed and reimbursed.

E. Use and Occupancy of Project Lands and Waters

93. Requiring a licensee to obtain prior Commission approval for every use or occupancy of project land would be unduly burdensome. Therefore, Article 415 allows the licensee to grant permission, without prior Commission approval, for the use and occupancy of project lands for such minor activities as landscape planting. Such uses must be consistent with the purposes of protecting and enhancing the scenic, recreational, and environmental values of the project.

F. Review of Final Plans and Specifications

94. Duke proposes changes in project operation that have been implemented since 2004 and would be required as part of this license. Article 301 requires Duke to file with the Commission a report that describes the probability of operating the spillway gates and activating the fuse plugs more often in light of the higher reservoir target levels. Article 301 requires Duke to develop a plan and schedule for remedial measures, if necessary, to ensure continued safe operation at the Glenville Development.

95. Where new construction or modifications to the project are involved, the Commission requires licensees to file revised drawings of project features as-built. Article 302 provides for the filing of these drawings.

STATE AND FEDERAL COMPREHENSIVE PLANS

96. Section 10(a)(2)(A) of the FPA[72] requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project.[73] Under section 10(a)(2)(A), federal and state agencies filed 37 comprehensive plans that address

[72] 16 U.S.C. § 803(a)(2)(A) (2006).

[73] Comprehensive plans for this purpose are defined at 18 C.F.R. § 2.19 (2010).

various resources in North Carolina. Of these, the staff identified and reviewed 10 comprehensive plans that are relevant to this project.[74] No conflicts were found.

APPLICANT'S PLANS AND CAPABILITIES

97. In accordance with sections 10(a)(2)(C) and 15(a) of the FPA,[75] Commission staff evaluated Duke's record as a licensee for these areas: (1) conservation efforts; (2) compliance history and ability to comply with the new license; (3) safe management, operation, and maintenance of the project; (4) ability to provide efficient and reliable electric service; (5) need for power; (6) transmission services; (7) cost effectiveness of plans; and (8) actions affecting the public. I accept the staff's finding in each of the following areas.

A. Conservation Efforts

98. Section 10(a)(2)(C) of the FPA requires the Commission to consider the extent of electricity consumption efficiency improvement programs in the case of license applicants primarily engaged in the generation or sale of electric power, like Duke. Duke has provided conservation services for its electricity customers since 1971. Duke has several programs to promote conservation and energy efficiency for residential, commercial, industrial, and agricultural customers, including: (1) making available special electric rates to customers who modify or build their homes to meet insulation and other energy conservation requirements and to large industrial customers that shift usage from peak times; (2) providing the public with energy saving tips through local advertisements; (3) making available an online energy audit suitable for individual residences or small business; and (4) providing on-site energy needs assessments along with recommendations on how to solve energy-related problems for larger businesses. These programs show that Duke is making an effort to conserve electricity and has made a satisfactory good faith effort to comply with section 10(a)(2)(C) of the FPA.

B. Compliance History and Ability to Comply with the New License

[74] The list of applicable plans can be found in section IX of the EA for the project. In addition to these comprehensive plans, staff reviewed the North Carolina Wildlife Action Plan, dated December 2005, and found no conflicts.

[75] 16 U.S.C. §§ 803(a)(2)(C) and 808(a) (2006).

99. Based on a review of Duke's compliance with the terms and conditions of the existing license, staff finds Duke's overall record of making timely filings and compliance with its license is satisfactory. Therefore, staff believes Duke can satisfy the conditions of a new license.

C. Safe Management, Operation, and Maintenance of the Project

100. Staff has reviewed Duke's management, operation, and maintenance of the West Fork Project pursuant to the requirements of 18 C.F.R. Part 12 and the Commission's Engineering Guidelines. Staff concluded that the dams and other project works meet the Commission's Engineering Guidelines and criteria, and that there is no reason to believe that Duke cannot continue to safely manage, operate, and maintain these facilities under a new license.

D. Ability to Provide Efficient and Reliable Electric Service

101. Staff has reviewed Duke's plans and its ability to operate and maintain the project in a manner most likely to provide efficient and reliable electric service. Staff's review indicates that Duke has devices that monitor structural movement or stress, seepage, uplift, and equipment failure at the project. Duke regularly inspects the project turbine generator units to ensure they continue to perform in an optimal manner, schedules maintenance to minimize effects on energy production, and since the project has been in operation, has undertaken several initiatives to ensure the project is able to operate reliably into the future. Staff concluded that Duke is capable of operating the project to provide efficient and reliable electric service in the future.

E. Need for Power

102. Duke is an integrated electric utility serving nearly 2 million people in a 22,000 square mile service area in North Carolina and South Carolina. The 24.6-MW West Fork Project generates an average of 95,474 MWh annually.

103. The West Fork Project is located within the Virginia-Carolinas area of the Southeastern Electric Reliability Council (SERC) region, which includes Virginia, North Carolina, and South Carolina. SERC expects capacity resources will be sufficient to provide adequate and reliable service for forecast demands. The capacity resource margin for 2005 was 13.8 percent. The forecast average annual demand growth rate was 2.0 percent. The 2005 summer total internal demand forecast was 161,811 MW, and the forecast for 2013 is 191,459 MW. Within the Virginia-Carolinas region, the forecast 2005 summer peak demand was 56,069 MW, and the 2013 summer peak demand is forecast to be 65,831 MW, an average growth rate of 2.1 percent. SERC anticipates that

capacity in addition to the currently planned capacity will be needed to maintain reliability.

104. Power from the West Fork Project can continue to meet Duke's customers' growing needs as well as help meet part of the regional need for power. The project may displace fossil-fueled electric power generation that the regional utilities currently use, and thereby may conserve nonrenewable fossil fuels and reduce the emission of noxious byproducts caused during the combustion of fossil fuels.

F. Transmission Services

105. The project's transmission facilities include the generator leads, three step-up transformers, and appurtenant facilities at the Glenville and Tuckasegee powerhouses. The project boundary also includes a 1.8-mile-long, 6.6-kV transmission line connecting the Tuckasegee powerhouse to a switchyard at the Glenville (Thorpe) development. Duke proposes no changes that would affect its own or other transmission services in the region.

G. Cost Effectiveness of Plans

106. Duke proposes to make minor modifications to enhance environmental resources affected by the project: (1) release a minimum flow from the Tuckasegee dam and provide recreation flows from the Glenville and Tuckasegee developments; (2) calibrate the existing staff gage located just upstream of the Tuckasegee powerhouse tailrace; and (3) calibrate the reservoir stage level gages to monitor the actual levels of the project reservoirs. Based on Duke's record as an existing licensee, staff concluded that these proposals are likely to be carried out in a cost-effective manner.

H. Actions Affecting the Public

107. Duke provided extensive opportunity for public involvement in the development of its application for a new license for the West Fork Project. During the previous license period Duke provided facilities to enhance the public use of project lands and facilities, and operated the project with consideration for the protection of downstream uses of the Tuckasegee River. Duke uses the project to help meet local power needs and pays taxes that contribute to the cost of public services provided by local governments.

PROJECT ECONOMICS

108. In determining whether to issue a new license for an existing hydroelectric project, the Commission considers a number of public interest factors, including the economic benefits of project power. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,[76] the Commission uses current costs to compare the costs of the project and likely alternative power with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. The basic purpose of the Commission's economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and of reasonable alternatives to project power. The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

109. In applying this analysis to the West Fork Project, we have considered two options: Duke's proposal and the project as licensed herein. As proposed by Duke, the levelized annual cost of operating the West Fork Project is $1,056,350, or $11.17/MWh. The proposed project would generate an estimated average of 94,561 MWh of energy annually. When we multiply our estimate of average generation by the alternative power cost of $30.42/MWh,[77] we get a total value of the project's power of $2,876,700 in 2005 dollars. To determine whether the proposed project is currently economically beneficial, staff subtracts the project's cost from the value of the project's power.[78] Therefore, in the first year of operation, the proposed project would cost $1,820,350, or $19.25/MWh, less than the likely alternative cost of power.

110. As licensed herein with the mandatory conditions and staff measures, the levelized annual cost of operating the project would be about $967,500, or $10.23/MWh. Average annual generation and the value of the project power would be similar as Duke's proposal. Subtracting the project's cost from the value of power in the first year of operation the project would cost $1,909,200, or $20.19/MWh, less than the likely alternative cost of power.

111. In considering public interest factors, the Commission takes into account that hydroelectric projects offer unique operational benefits to the electric utility system (ancillary service benefits). These benefits include their ability to help maintain the

---

[76] 72 FERC ¶ 61,027 (1995).

[77] The alternative power cost of $30.42 per MWh is based on information obtained from Duke.

[78] Details of staff's economic analysis for the project, as licensed herein, and for various alternatives are included in the EA at 313-29.

stability of a power system, such as by quickly adjusting power output to respond to rapid changes in system load; and to respond rapidly to a major utility system or regional blackout by providing a source of power to help restart fossil-fuel based generating stations and put them back on line.

COMPREHENSIVE DEVELOPMENT

112. Sections 4(e) and 10(a)(1) of the FPA[79] require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of fish and wildlife, the protection of recreational opportunities, and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment would be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to issue a new license for this project, and the terms and conditions included herein, reflects such consideration.

113. The EA for the West Fork Project contains background information, analysis of effects, and support for related license articles. I conclude, based on the record of this proceeding, including the EA and the comments thereon, that relicensing the West Fork Project as described in this order would not constitute a major federal action significantly affecting the quality of the human environment. The project will be safe if operated and maintained in accordance with the requirements of this license.

114. Based on an independent review and evaluation of the project, recommendations from the resource agencies and other stakeholders, and the no-action alternative, as documented in the EA, I find that issuance of a new license for the West Fork Project, with the conditions attached hereto, will serve the public interest because it is best adapted to the comprehensive development of the Tuckasegee River.

115. I have selected this alternative because: (1) issuance of a new license will serve to maintain a beneficial, dependable, and an inexpensive source of electric energy; (2) the required environmental measures will protect and enhance fish and wildlife resources,

[79] 16 U.S.C. §§ 797(e) and 803(a)(1) (2006).

water quality, recreation resources, and historic properties; and (3) the 24.6-MW of capacity from a renewable resource may offset the use of fossil-fueled, steam-electric generating plants, thereby conserving nonrenewable resources and reducing atmospheric pollution.

LICENSE TERM

116. The Commission's general policy is to establish 30-year terms for projects with little or no redevelopment, new construction, new capacity, or environmental mitigation and enhancement measures; 40-year terms for projects with a moderate amount of such activities; and 50-year terms for projects with extensive measures.[80] This license authorizes a minor amount of construction, no new capacity, and only a minor amount of new environmental mitigation and enhancement measures. Accordingly, I will issue this license for a term of 30 years.

The Director orders:

(A) This license is issued to Duke Energy Carolinas, LLC (licensee), for a period of 30 years, effective the first day of the month in which this order is issued, to construct, operate, and maintain the West Fork Hydroelectric Project. This license is subject to the terms and conditions of the Federal Power Act (FPA), which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in these lands, described in the project description and the project boundary discussion of this order.

(2) Project works which include:

Glenville Development

The Glenville development consisting of: (1) a 900-foot-long, 150-foot-high earth core and rockfill Glenville dam; (2) a 410-foot-long, 122-foot-high rockfill saddle dam; (3) a 200-foot-long spillway that includes two 25-foot-wide by 12-foot-high Tainter gates and six erodible fuse plug sections; (4) a 1,462-acre reservoir, with a maximum reservoir elevation of 3,491.75 feet mean sea level (msl) and a useable storage capacity of 20,100

[80] *See Consumers Power Co.*, 68 FERC ¶ 61,077 at 61,383-84 (1994).

acre-feet; (5) a 6.43-mile-long bypassed reach on the West Fork of the Tuckasegee River; (6) a power intake with trashracks having a 1.25-inch clear bar spacing and two motor operated sluice gates; (7) a 16,287-foot-long pressure conduit consisting of three sections of tunnel, two sections of steel pipe and a steel penstock section that terminate in two nozzles; (8) a 102-foot-long by 50-foot-wide concrete and brick powerhouse containing one horizontal impulse-type generating unit with an installed capacity of 21.6 megawatts (MW) and a hydraulic capacity of 270 cubic feet per second (cfs); and (9) appurtenant facilities.

Tuckasegee Development

The Tuckasegee development consisting of: (1) a 254-foot-long, 61-foot-high concrete arch dam (Tuckasegee dam), which includes a 233.5-foot-long spillway with twenty-three 9.03-foot-wide flashboards, one 18.28-foot-wide flashboard, and one 7.54-foot-wide trashrack, all 3 feet high; (2) a 7.9-acre reservoir, with a maximum reservoir elevation of 2,278.75 feet msl and a useable storage capacity of 35-acre-feet; (3) a 1.24-mile-long bypassed reach on the West Fork of the Tuckasegee River; (4) a power intake with trashracks having a 1.25-inch clear bar spacing; (5) a 3,246-foot-long pressure tunnel, leading to a vertical surge tank that is 15 feet in diameter, and a 198-foot-long penstock that is approximately 9 feet in diameter; (6) a 32-foot-long by 26.5-foot-wide concrete powerhouse containing one vertical Francis-type generating unit with an installed capacity of 3.0 MW and a hydraulic capacity of 360 cfs; and (7) appurtenant facilities.

The West Fork Project also includes transmission facilities, consisting of: (1) generator leads, three step-up transformers, and appurtenant facilities at the Glenville and Tuckasegee powerhouses and (2) a 1.8-mile-long, 6.6-kV transmission line connecting the Tuckasegee powerhouse to a switchyard at the Glenville (Thorpe) development.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F shown below:

Exhibit A: The following sections of exhibit A filed on January 26, 2004 and further clarified on July 15, 2004: Exhibit A-Description of Project, pages A-1 and A3 through A-9.

Exhibit F: The following sections of exhibit F filed on January 26, 2004 and revised on October 29, 2004:

Exhibit F Drawing	FERC No. 2686-	Description
Sheet F-1	1001	Thorpe General Plan and Tunnel Profile
Sheet F-2	1002	Thorpe General Plan, Dam, Saddle Dam, and Spillway
Sheet F-3	1003	Thorpe Dam Sections
Sheet F-4	1004	Thorpe Spillway Plan and Sections
Sheet F-5	1005	Thorpe Intake Structure Plan and Section
Sheet F-6	1006	Thorpe Powerhouse Plan
Sheet F-7	1007	Thorpe Powerhouse Longitudinal Section
Sheet F-8	1008	Thorpe Powerhouse Cross Section
Sheet F-9	1009	Thorpe Powerhouse Elevation, Plot Plan
Sheet F-10	1010	Tuckasegee General Layout
Sheet F-11	1011	Tuckasegee Dam Foundation
Sheet F-12	1012	Tuckasegee Dam Plan and Sections
Sheet F-13	1013	Tuckasegee Powerhouse Plan and Sections

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project, all portable property that may be employed in connection with the project, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The exhibits A and F described above are approved and made part of this license. The exhibit G drawings filed as part of the application for license do not conform to Commission regulations and are not approved.

(D) This license is subject to the conditions submitted by the North Carolina Department of Environment and Natural Resources, Division of Water Quality under section 401(a)(1) of the Clean Water Act, 33 U.S.C. § 1341(a)(1) (2006), as those conditions are set forth in Appendix A to this order.

(E) The Historic Properties Management Plan, West Fork Hydroelectric Project No. 2686, filed by the licensee on August 7, 2006, is approved and made a part of this license. Article 414 requires implementation of the Programmatic Agreement and the plan.

(F) This license is also subject to the articles set forth in Form L-10 (Oct. 1975), entitled "Terms and Conditions of License for Constructed Major Project Affecting the Interests of Interstate or Foreign Commerce" (*see* 54 FPC 1799 *et seq*.), as reproduced at the end of this order, and the following additional articles:

Article 201. *Administrative Annual Charges*. The licensee shall pay the United States annual charges, effective the first day of the month in which this license is issued, and as determined in accordance with the provisions of the Commission's regulations in effect from time to time, for the purposes of reimbursing the United States for the cost of administration of Part I of the Federal Power Act. The authorized installed capacity for that purpose is 24.6 megawatts.

Article 202. *Exhibit F Drawings*. Within 45 days of the date of issuance of the license, the licensee shall file the approved exhibit drawings in aperture card and electronic file formats.

(a) Three sets of the approved exhibit drawings shall be reproduced on silver or gelatin 35mm microfilm. All microfilm shall be mounted on type D (3-1/4" X 7-3/8") aperture cards. Prior to microfilming, the FERC Project-Drawing Number (i.e., P-2686-1001 through P-2686-1022) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number shall be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (i.e., F-1, etc.), Drawing Title, and date of this license shall be typed on the upper left corner of each aperture card.

Two of the sets of aperture cards shall be filed with the Secretary of the Commission, ATTN: OEP/DHAC. The third set shall be filed with the Commission's Division of Dam Safety and Inspections Atlanta Regional Office.

(b) The licensee shall file two separate sets of exhibit drawings in electronic raster format with the Secretary of the Commission, ATTN: OEP/DHAC. A third set shall be filed with the Commission's Division of Dam Safety and Inspections Atlanta Regional Office. Exhibit F drawings must be identified as Critical Infrastructure Information (CEII) material under 18 C.F.R. § 388.113(c). Each drawing must be a separate electronic file, and the file name shall include: FERC Project-Drawing Number, FERC Exhibit, Drawing Title, date of this license, and file extension in the following format [P-2686-1001, F-1, Description, MM-DD-YYYY.TIF]. Electronic drawings shall meet the following format specification:

IMAGERY – black & white raster file
FILE TYPE – Tagged Image File Format, (TIFF) CCITT Group 4

RESOLUTION – 300 dpi desired, (200 dpi min)
DRAWING SIZE FORMAT – 24" X 36" (min), 28" X 40" (max)
FILE SIZE – less than 1 MB desired

Article 203. *Exhibit G Drawings*. Within 90 days of the effective date of the license, the licensee shall file, for Commission approval, revised Exhibit G drawings enclosing within the project boundary all principal project works necessary for operation and maintenance of the project, including the proposed and existing project recreation sites. The Exhibit G drawings must comply with §§ 4.39 and 4.41 of the Commission's regulations.

Article 204. *Amortization Reserve*. Pursuant to section 10(d) of the Federal Power Act, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The licensee shall set aside in a project amortization reserve account at the end of each fiscal year one half of the project surplus earnings, if any, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the licensee shall deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The licensee shall set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The licensee shall maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves shall be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly included in the licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rate for such ratios shall be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department's 10-year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 205. *Headwater Benefits*. If the licensee's project was directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the licensee shall reimburse the owner of the headwater improvement for

those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license. The benefits will be assessed in accordance with Part 11, Subpart B, of the Commission's regulations.

Article 301. *Safety Assessment.* Within 60 days of license issuance, the licensee shall submit one copy to the Commission's Division of Dam Safety and Inspections (D2SI)-Atlanta Regional Engineer and two copies to the Commission (one of these shall be a courtesy copy to the Director, D2SI) of a report describing the probability of operating the spillway gates and activating the fuse plugs more often in light of the higher reservoir target levels at the Glenville development.

The report shall compare the probabilities of the spillway gates operating and fuse plugs activating under the historical and licensed target levels. The report shall assess if there would be a significantly higher likelihood of the gates operating, fuse plugs activating, and low-lying structures located downstream of the reservoir being flooded under the new operating scenario. If necessary, the report shall include a plan and schedule for performing any remedial measures necessary to ensure the continued safe operation of the Glenville development during high flows.

The Commission reserves the right to require changes in project structures, operation, reservoir elevations, or flows based on the review of the report by the Commission's D2SI-Atlanta Regional Engineer. Upon notification by the Commission, the licensee shall implement any changes required by the Commission.

Article 302. *As-Built Drawings*. Within 90 days of completion of construction of the facilities authorized by this license, the licensee shall file for Commission approval, revised exhibits A, F, and G, as applicable, to describe and show those project facilities as built. A courtesy copy shall be filed with the Commission's Division of Dam Safety and Inspections (D2SI)-Atlanta Regional Engineer, the Director, D2SI, and the Director, Division of Hydropower Administration and Compliance.

Article 401. *Reservoir Level Management*. Upon issuance of this license, the licensee shall operate the West Fork Project according to these reservoir level management provisions, as required by Condition 6 of the North Carolina Department of Environment and Natural Resources, Division of Water Quality (North Carolina DWQ) water quality certification to protect the aquatic and recreation resources in the Tuckasegee River and to provide downstream flows.

The licensee shall use the existing float-operating gages or suitable replacement gages to monitor the actual levels of the West Fork Project reservoirs. The licensee shall calibrate the reservoir stage level gages within 60 days of license issuance and at least

once every 2 years thereafter.

The licensee shall maintain the elevation of Lake Glenville between the Normal Minimum and Normal Maximum Elevations (Normal Operating Range) indicated in the table below, except when the licensee is permitted to vary from the Normal Operating Range as established in the Low Inflow Protocol (Appendix A) and in the Hydro Project Maintenance & Emergency Protocol (Appendix A). All elevations for Lake Glenville are relative to the top of the dam, including the flood gates, fuse plugs, and flashboards where applicable, with 100.0 feet as the equivalent of the normal full pond elevation. The elevations shown shall be for the first day of the given month. Elevations for other days of the month shall be determined by linear interpolation.

The Normal Operating Range for Lake Glenville shall be as follows:

Normal Full Pond Elevation = 100.0 feet = approximately 3,491.7 feet (USGS datum)*

Month	Normal Minimum Elevation (feet)	Normal Target Elevation (feet)	Normal Maximum Elevation (feet)
Jan	85	90	94
Feb	85	90	94
Mar	88	91	94
Apr	90	93	96
May	95	97	99
Jun	95	97	99
Jul	95	97	99
Aug	93	95	98
Sep	90	93	94
Oct	90	93	94
Nov	86	90	94
Dec	85	90	94

* U.S. Geological Survey (USGS).

The licensee shall, to the extent possible, manage lake levels to follow the Normal Target Elevations at the reservoir. The licensee shall continually review hydrologic conditions and adhere to the Low Inflow Protocol during drought conditions.

The reservoir level requirements may be temporarily modified from the Normal Operating Ranges if required by conditions beyond the control of the licensee, for short periods during annual inspection and repair events, or by operating emergencies or maintenance needs as defined in the Low Inflow Protocol and the Hydro Project Maintenance & Emergency Protocol. If operations or reservoir levels are so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident, and shall provide the reason for the change in reservoir levels.

Article 402. *Recreation Plan*. Within 1 year of license issuance, the licensee shall file with the Commission for approval, a Recreation Plan for the West Fork Hydroelectric Project to enhance the recreation resources at the project. The plan shall include, but not be limited to, the following items:

A. Project-Wide

(1) A provision to install a wildlife viewing platform within the existing West Fork Project boundary; (2) a description of soil erosion and sediment control measures to be used where ground-disturbing activities are proposed; (3) a provision for trash removal from the project recreation sites; (4) a discussion of how the needs of the disabled were considered in the planning and design of the recreation facilities; (5) an evaluation of the existing signage at the recreation sites for accuracy of information and a description of any proposed revisions to the existing or installation of new signage; (6) a schedule for construction of the new facilities described below; and (7) a provision for the continued operation and maintenance of all project recreation sites. The plan shall include appropriate site drawings, specifications, and a map or maps showing the type of recreation facilities and their location in relation to the project boundary.

B. Glenville Development

At Glenville development, describe the three existing project recreation sites: (1) the Powerhouse (or Low Water) Public Boat Access Area; (2) the Pine Creek Public Boat Access Area; and (3) the Pines Day-Use Area.

1. *Powerhouse (or Low Water) Public Boat Access Area*

(1) Install a portable toilet; (2) install lighting that shall minimize effects on fish and wildlife resources; (3) install a barrier-free dock; (4) develop a bank fishing area with a trail; and (5) reconfigure the entrance road at the Powerhouse (or Low Water) Public Boat Access Area.

2. *Pine Creek Public Boat Access Area*

(1) Install a portable toilet; (2) install lighting to minimize effects on fish and wildlife resources; and (3) install a barrier-free dock.

3. *Pines Day-Use Area*

(1) Provide for a swimming area, beach, and parking and (2) develop a bank fishing area with a trail.

To provide whitewater boating access to the West Fork of the Tuckasegee River, construct an approximate 1.5-mile-long trail on licensee-owned land from Glenville Dam to below High Falls and a parking area for at least five vehicles.

C. Tuckasegee Development

At the Tuckasegee development: (1) construct a boat take-out area and parking for at least five vehicles on licensee-owned land at the headwaters of Tuckasegee Lake and (2) construct a trail extending from the new boat take-out area on licensee-owned land along the West Fork (Glenville) bypassed reach.

The Recreation Plan shall be developed after consultation with the U.S. Fish and Wildlife Service, North Carolina Wildlife Resources Commission, and the North Carolina Division of Parks and Recreation. The licensee shall include with the plan documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment and to make recommendations prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Land-disturbing or land-clearing activities associated with the Recreation Plan shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee shall implement the plan, including any changes required by the Commission.

Article 403. *Public Information at the West Fork Project.* The licensee shall continue to provide information on reservoir levels and recreation flows on its website for Lake Glenville (Glenville Development) and Tuckasegee Lake (Tuckasegee Development) and a link on its website to a suitable U.S. Geological Survey Gage on the Tuckasegee River to provide information on river flows.

The licensee shall continue to provide information on reservoir levels for each of the project's reservoirs and special meetings on its telephone system.

Article 404. *Minimum Flows and Flow Monitoring Plan*. Upon issuance of this license, the licensee shall release from the West Fork Project into the West Fork of the

Tuckasegee River a year-round minimum flow of 20 cubic feet per second, as required by Condition 6 of the North Carolina Department of Environment and Natural Resources, Division of Water Quality (North Carolina DWQ) water quality certification.

The minimum flow may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods during annual inspection and repair events, or for maintenance needs as defined in the Low Inflow Protocol (Appendix A) and the Hydro Project Maintenance & Emergency Protocol (Appendix A). Such temporary variances shall be in accordance with the Low Inflow Protocol or the Hydro Project Maintenance & Emergency Protocol.

The licensee may also modify minimum flows for short periods upon mutual agreement between the licensee, the North Carolina Wildlife Resources Commission (North Carolina WRC), the North Carolina Division of Water Resources (North Carolina DWR), the North Carolina DWQ, North Carolina Department of Natural Resources (North Carolina DENR), the U.S. Fish and Wildlife Service (FWS), and U.S. Forest Service (Forest Service). If the minimum flows are so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident, and shall provide the reason for the change in minimum flows.

Minimum Flow/Flow Monitoring Plan

Within 180 days of license issuance, the licensee shall file with the Commission for approval, a plan to provide the 20-cfs minimum flow as specified above, monitor the recreation flows as required in Article 405, and monitor the whitewater boating flows as required in Article 406. The plan shall include the following provisions: (1) initially calibrate the staff gage used to monitor the minimum flow at Tuckasegee and at least once every 2 years thereafter; and (2) a method of monitoring flows in the vicinity of the inactive USGS Gage No. 03510500 at Dillsboro, or other suitable monitoring location.

The plan shall be developed after consultation with the North Carolina WRC, the North Carolina DWR, the North Carolina DWQ, the North Carolina DENR, the FWS, and the Forest Service. The licensee shall include with the plan an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee shall allow a minimum of 60 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Implementation of the plan and the release of the minimum flows shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee shall implement the plan, including any changes required by the Commission.

Article 405. *Recreation Flows*. Within 1 year of license issuance, the licensee shall operate the West Fork Project to provide the following Normal Generation Schedule to Support Recreation for recreation flow releases at or above the best efficiency flow into the main stem of the Tuckasegee River:

(1) During the Primary Angling Periods (defined as the first weekend after Labor Day through the last weekend of October, and April 1 through the first weekend of June) the flows shall be released from the West Fork Project adequate to maintain about 500 cubic feet per second (cfs) as measured at the inactive U.S. Geological Survey (USGS) Gage No. 03510500 at Dillsboro, or a suitable replacement gage in this vicinity. During part of this time period, boating release schedules overlap. During this overlap period (the Saturday that occurs nine days before Memorial Day through the first weekend of June and Saturdays in September and October), the Normal Generation Schedule to Support Recreation shall be six hours per day on each of the Saturday and Sunday one week prior to Memorial Day weekend, Saturday and Monday of Memorial Day weekend, and 3 of the 4 Saturdays in September and October, including Tuesday, Friday, and Saturday for the period between Memorial Day weekend through the first weekend in June.

(2) During the Primary Boating Periods (defined as the period after the first weekend of June through Labor Day), flows shall be released from the West Fork Project adequate to maintain about 800 cfs, as measured at the inactive Dillsboro gage, or suitable replacement gage. During this time period, the Normal Generation Schedule to Support Recreation shall be: (a) for 3 out of 4 weeks, flows on Tuesday, Friday, and Sunday for six hours per day and (b) for 1 out of 4 weeks, flows on Tuesday, Friday, and Saturday for six hours per day.

The licensee shall initiate all releases required by this Article so that the released flow arrives at the inactive Dillsboro Gage, or a suitable replacement gage at approximately 10:30 a.m. Eastern Time.

(3) The licensee shall also adjust for baseline flows by checking the river flow on a daily basis at the inactive Dillsboro Gage, or a suitable replacement gage. The licensee shall then project the expected river flow during the next scheduled generation release to support recreation. When projected baseline river flow (*i.e.*, the flow rate at the gage

without the licensee making the scheduled generation release to support recreation) is expected to average more than 500 cfs over the period from 10:30 a.m. to 4:30 p.m. Eastern Time, the licensee may reduce or eliminate specific recreation flow releases from the hydropower stations for that day.

Provided the sponsoring or requesting organization has consulted, at a minimum, with the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Resources, the U.S. Fish and Wildlife Service, the USGS, and American Whitewater and has integrated their needs with the Normal Generation Schedule to Support Recreation as much as possible, consider on a case-by-case basis requests to temporarily alter the Normal Generation Schedule to Support Recreation for special purposes. The licensee shall consider requests that shall shift the hours of generation to different times or reduce the total hours of releases to conserve the available water supply, but shall not consider requests that shall add additional hours to the Normal Generation Schedule to Support Recreation for the month.

The licensee may temporarily vary from the recreation flow releases from the project as identified above if required by conditions beyond the licensee's control or by operating emergencies or maintenance needs as defined in the Low Inflow Protocol (Appendix A) and the Hydro Project Maintenance & Emergency Protocol (Appendix A). If the recreation flow releases are so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

Article 406. *Whitewater Boating Flow Releases at Glenville Development*. Within 1 year of license issuance, the licensee shall release 250 cfs for whitewater boating into the 6.43-mile-long West Fork (Glenville) bypassed reach using a Tainter gate at Glenville dam. The whitewater boating flow release schedule shall be as follows: (1) for one Saturday and one Sunday, between April 1 and April 30, 250 cubic feet per second (cfs) from 10:00 a.m. to 4:00 p.m. Eastern Time and (2) for five total weekend days between May 1 and September 30, 250 cfs from 10:00 a.m. to 4:00 p.m. Eastern Time.

The licensee may temporarily vary from the whitewater boating flow releases from the Glenville dam as identified above if required by conditions beyond the licensee's control or by operating emergencies or maintenance needs as defined in the Low Inflow Protocol (Appendix A) and the Hydro Project Maintenance & Emergency Protocol (Appendix A). If the flow releases are so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

The licensee shall coordinate the whitewater boating flow releases at Glenville dam with the construction of the new recreation facilities at the West Fork (Glenville)

bypassed reach required by Article 402 and the Fishery Monitoring Plan, as identified below.

Fishery Monitoring Plan

Within 6 months of license issuance, the licensee shall file with the Commission for approval a Fishery Monitoring Plan to monitor the existing fishery in the bypassed reach during the recreation flow releases at Glenville Development. The plan shall include, but not be limited to, the following provisions: (1) by October 1 of the first and second seasons of the whitewater boating flow releases, the licensee shall convene a meeting with the North Carolina Wildlife Resources Commission (North Carolina WRC), the North Carolina Division of Water Resources (North Carolina DWR), the U.S. Fish and Wildlife Service (FWS), the U.S. Geological Survey (USGS), and American Whitewater to discuss whether any modifications to the whitewater boating flow releases shall be made; (2) a report that summarizes the meeting and includes recommendations from the entities above to the scheduled flow releases; (3) parameters contained in the Hydro Project Maintenance & Emergency Protocol, such as measuring and monitoring dissolved oxygen and temperature; and (4) a map or maps that delineate the location of the fishery monitoring.

The Fishery Monitoring Plan shall be developed after consultation with the North Carolina WRC, the North Carolina DWR, the FWS, the USGS, and American Whitewater. The licensee shall include with the plan documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment and to make recommendations prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Implementation of the plan shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee shall implement the plan, including any changes required by the Commission.

Article 407. *Evaluation of Recreation Flows*. In year 6 of the license, the licensee shall convene a meeting with the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Resources, the U.S. Fish and Wildlife Service, the U.S. Geological Survey, and American Whitewater to evaluate the recreation flows after 5 years of releases. By October 31 of year 6 of the license, the licensee shall file with the Commission a report that summarizes the meeting and includes recommendations, if any,

to change the scheduled recreation flows. Thereafter, every 6 years during the term of the license, the licensee shall file a report with the Commission on the evaluation of the recreation flows.

The Commission reserves the right to require changes to the report. Modifications to the scheduled recreation flows shall not be implemented until the licensee is notified by the Commission that the report is approved. Upon Commission approval the licensee shall implement the modified scheduled recreation flows, including any changes required by the Commission.

Article 408. *Shoreline Management Plan*. Within 1 year of license issuance, the licensee shall file with the Commission for approval, a Shoreline Management Plan for the West Fork Hydroelectric Project to protect the scenic quality and environmental resources at the project. The Shoreline Management Plan shall incorporate the Shoreline Management Guidelines filed on July 22, 2003, West Fork Hydroelectric Project license application, Volume III, Operations and Trash Removal, that specifically pertain to the West Fork Hydroelectric Project.

The Shoreline Management Plan shall include, but not be limited to, the following items: (1) a list of land use management objectives and goals; (2) a list and description of the types of land use classifications, to include at a minimum: (a) private; (b) public recreation access; (c) environmentally sensitive areas; and (d) commercial; (3) a map or maps that clearly identifies the West Fork Project boundary and the above land use classifications; (4) a description of the basis for the various land use classifications, including supporting documentation; (5) a description of allowable and prohibited uses for each of the above land use classifications; (6) a permitting program for allowable facilities and/or uses of the shoreline, including permit application procedures, monitoring and enforcement provisions; (7) a provision for informing the public of the licensee's procedures for issuance of a permit and/or lease, including the application process; and (8) a provision to review, every 5 years, the adequacy of the Shoreline Management Plan to meet its stated goals and the need for any modifications to the plan.

The Shoreline Management Plan shall be developed after consultation with the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, and the North Carolina State Historic Preservation Office. The licensee shall include with the plan documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Implementation of the plan shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee shall implement the plan, including any changes required by the Commission.

Article 409. *Sediment Management Plan.* The licensee shall minimize the drawdown of the West Fork Project reservoirs for the purpose of mechanically removing sediment, as required by Condition 6 of the North Carolina Department of Environment and Natural Resources, Division of Water Quality (North Carolina DWQ) water quality certification. When sediment must be mechanically removed, or the reservoirs must be drawn down, the licensee shall implement a Sediment Management Plan, as identified below.

At least 90 days before the start of any sediment removal activities, the licensee shall file with the Commission for approval, a plan to remove and dispose of accumulated sediment from the Lake Glenville and the Tuckasegee Lake to minimize environmental effects on downstream aquatic resources, including riparian habitat, sensitive to sedimentation.

The Sediment Management Plan shall include, but not be limited to, the following items: (1) a discussion of best management practices to control sedimentation upstream of the Tuckasegee and Glenville developments from entering the downstream reaches; (2) a provision for dredging that shall include measures to minimize the impact of the project drawdown and sediment removal on environmental resources; and (3) an implementation schedule.

The Sediment Management Plan shall be developed after consultation with North Carolina Wildlife Resources Commission, the U.S. Fish and Wildlife Service, the North Carolina Division of Water Resources, the U.S. Army Corps of Engineers, and the North Carolina DWQ. The licensee shall include with the plan documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Implementation of the plan shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee shall implement the plan, including

any changes required by the Commission.

Article 410. Intentionally Left Blank.

Article 411. *Compliance Monitoring and Reporting.* By May 31 of each year, the licensee shall file with the Commission an annual report, as required by Condition 6 of the North Carolina Department of Environment and Natural Resources, Division of Water Quality water quality certification, that shall document the following items: (1) compliance with the Reservoir Level Management required in Article 401 that includes a table of the elevations of Lake Glenville on a daily basis during the previous calendar year and any deviations of reservoir levels above or below the Normal Operating Range for the reservoir; (2) the minimum flow releases required by Article 404 were met during the previous calendar year and any deviations of the minimum flow release requirements; and (3) the recreation flow releases from the West Fork Project required by Article 405 were met during the previous calendar year and any deviations of the recreation flow releases.

The licensee's compliance with these operating requirements shall include an explanation of any incident during the previous calendar year, when deviations occurred, and information sufficient to explain the reasons for each such incident.

Article 412. *Woody Debris Management Plan.* Within 180 days of license issuance, the licensee shall file with the Commission for approval, a Woody Debris Management Plan to pass downstream large woody debris collected at the West Fork Project dams to improve aquatic habitat in the Tuckasegee River. The Woody Debris Management Plan shall include, but not be limited to, the following items: (1) a definition of large woody debris; (2) the frequency and methods to be used for large woody debris passage; and (3) an implementation schedule.

The Woody Debris Management Plan shall be developed after consultation with the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Resources, the North Carolina Division of Water Quality, and the U.S. Fish and Wildlife Service. The licensee shall include with the plan documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Implementation

of the plan shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee shall implement the plan, including any changes required by the Commission.

Article 413. *Reservation of Authority to Prescribe Fishways*. Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or to provide for the construction, operation, and maintenance of, such fishways as may be prescribed by the Secretary of the Interior pursuant to section 18 of the Federal Power Act.

Article 414. *Programmatic Agreement*. The licensee shall implement the "Final Programmatic Agreement Among the Federal Energy Regulatory Commission and the North Carolina State Historic Preservation Officer for Managing Historic Properties that may be Affected by a License Issuing to Duke Power Company, LLC for the Continued Operation and Maintenance of the West Fork Hydroelectric Project in Jackson County, North Carolina," executed on September 19, 2006, and including but not limited to the approved Historic Properties Management Plan (HPMP), filed August 7, 2006, for the project. In the event that the Programmatic Agreement is terminated, the licensee shall continue to implement the provisions of its approved HPMP. The Commission reserves the right to require changes to the HPMP at any time during the term of the license.

Article 415. *Use and Occupancy*. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies, for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape

plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or

waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Energy Projects, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer;

(2) Before conveying the interest, the shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value;

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee shall not unduly restrict public access to project waters;

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(G) The licensee shall serve copies of any Commission filing required by this order on any entity specified in the order to be consulted on matters relating to that filing. Proof of service on these entities must accompany the filing with the Commission.

(H) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the FPA, 16 U.S.C. § 8251 (2006), and section 385.713 of the Commission's regulations, 18 C.F.R. § 385.713 (2010). The filing of a request for rehearing does not operate as a stay of the effective date of this license or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

Jeff C. Wright
Director
Office of Energy Projects

Form L-10
(October, 1975)

TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED MAJOR PROJECT AFFECTING THE INTERESTS OF INTERSTATE OR FOREIGN COMMERCE

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project area and project works shall be in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Article 4. The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and supervision of the Regional Engineer, Federal Energy Regulatory Commission, in the

region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him such information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and shall notify him of the date upon which work with respect to any alteration will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall submit to said representative a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of any such alterations to the project. Construction of said alterations or any feature thereof shall not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights or occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a nonpower licensee under the provisions of Section 15

of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

Article 7. The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 10. The Licensee shall, after notice and opportunity for hearing,

coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission any direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 11. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

Article 12. The operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Commission may prescribe for the purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant

possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 14. In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 17. The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable

modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 21. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued

operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 22. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 23. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

APPENDIX A

Water Quality Certificate Conditions for the West Fork Project Issued By the North Carolina Department of Environment and Natural Resources, Division of Water Quality Issued July 15, 2010, and Revised on July 30, 2010.

Conditions of Certification:

1. No waste, spoil, solids, or fill of any kind shall occur in wetlands, waters, or riparian areas beyond the footprint of the impacts depicted in the Certification. All construction activities, including the design, installation, operation, and maintenance of sediment and erosion control Best Management Practices, shall be performed so that no violations of State Water Quality Standards, Statutes, or Rules occur.

2. Sediment and erosion control measures shall not be placed in wetlands or waters to the maximum extent practicable. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, they shall be removed and the natural grade restored within six months of the date that the North Carolina Division of Land Resources has released the project.

3. Duke Energy Carolinas, LLC shall identify and report in writing existing and proposed consumptive uses of West Fork Project waters to DWQ and the North Carolina Division of Water Resources (DWR). Duke Energy Carolinas, LLC shall report the existing or projected (as appropriate) average consumptive withdrawal and maximum approved withdrawal capacity for each water intake in excess of one million gallons per day that is located or proposed for location within the Federal Energy Regulatory Commission (FERC) Project boundary. Duke Energy Carolinas, LLC shall report existing consumptive uses to DWQ and DWR within 60 days following the acceptance of the License and shall report proposed new or expanded consumptive uses to DWQ and DWR within 30 days following receipt of a written request for approval of a proposed new or expanded withdrawal and before submitting any approval requests to FERC.

4. This Certification does not grant or affirm any property right, license or privilege in any waters or any right of use in any waters. This Certification does not authorize any person to interfere with the riparian rights, littoral rights or water use rights of any other person, and this Certification does not create any prescriptive right or any right of priority regarding any usage of water. No person shall interpose this Certification as a defense in any action respecting the determination of riparian or littoral rights or other water use rights. No consumptive user is deemed by virtue of this Certification to possess any prescriptive or other right of priority with respect to any other consumptive user

regardless of the quantity of the withdrawal or the date on which the withdrawal was initiated or expanded. This Certification issues on the express understanding of the North Carolina Department of Environment and Natural Resources (DENR) that, pursuant to Federal Power Act Section 27, 16 U.S.C. § 821, the License does not establish or determine a proprietary right to any use of water. It establishes the nature of the use to which a proprietary right may be put under the Federal Power Act.

Continuing Compliance

5. Duke Energy Carolinas, LLC shall conduct its activities in a manner consistent with State Water Quality Standards (including any requirements resulting from compliance with Section 303(d) of the Clean Water Act) and any other appropriate requirements of State law and federal law. If the Division determines that, as a result of the discharge or operation of the West Fork Project, such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the Division may reevaluate and modify this Certification to include conditions relative to the discharge or operation of the West Fork Project to assure compliance with such standards and requirements in accordance with 15A NCAC 2H.0507(d). Before modifying the Certification, the Division shall notify Duke Energy Carolinas, LLC and the FERC, provide public notice in accordance with 15A NCAC 2H.0503 and provide opportunity for public hearing in accordance with 15A NCAC 2H.0504. Any new or revised conditions shall be provided to Duke Energy Carolinas, LLC in writing, shall be provided to the FERC for reference in any Permit or License issued by that agency and shall also become conditions of the FERC License for the project.

Other Conditions

6. Comprehensive Settlement Agreement – The Comprehensive Settlement Agreement dated October 23, 2003 is hereby incorporated into this Certification by reference. In particular, the following sections, including any attachments identified within those sections, of the TCST Settlement Agreement dated October 23, 2003 are hereby incorporated into this Certification by reference: Section 1.0 (Reservoir Level Agreements); Section 4.0 (Minimum Flow Agreements in the Tuckasegee River Main Stem and Bypassed Stream Reaches); Section 9.0 (Sediment Management Agreements); Section 14.0 (Agreements on Compliance Monitoring and Reporting Requirements); Attachment B – Low Inflow Protocol (LIP) for the West Fork and East Fork Projects and Attachment C – Hydro Project Maintenance and Emergency Protocol (HPMEP) for the West Fork and East Fork Projects. If Duke Energy Carolinas, LLC believes that any of

the listed sections or attachments of that Comprehensive Settlement Agreement are not pertinent to water quality, then they shall so notify DWQ in writing for DWQ's written concurrence.

Low Inflow Protocol (LIP) for the West Fork and East Fork Projects

Introduction

This Low Inflow Protocol (LIP) provides trigger points and procedures for how the East Fork Project (FERC # 2698) and West Fork Project (FERC # 2686) will be operated by the Licensee during periods of low inflow (i.e. periods when there is not enough water flowing into the East Fork and West Fork project reservoirs to meet the normal needs for power generation, recreation flows, minimum flows, any on-reservoir water withdrawals and lake level maintenance). The protocol was developed on the basis that all parties with interests in water quantity will share the impact of low inflow.

In general during periods of normal inflow, the Licensee will provide at least a prescribed number of hours per day of generation to support electric customer needs and the downstream flow needs in the main stem of the Tuckasegee River (typically during different periods each day), in addition to providing minimum flows in the Wolf Creek Bypassed Reach, scheduled Tainter gate releases from Glenville Dam for recreation and maintaining lake levels above certain prescribed minimum levels. During low inflow periods when the Licensee cannot meet all of the above conditions, it will reduce generation weekly by a prescribed amount per day during generation and/or recreation periods, along with corresponding weekly reductions in bypass flows, Tainter gate releases for recreation and minimum reservoir levels. In addition, any large (i.e. greater than or equal to one Million Gallons per Day (MGD) maximum instantaneous capacity) water intakes that are authorized on the East Fork or West Fork project reservoirs in the future will also have a reduction protocol incorporated into the easement documents that the Licensee uses to approve of such intakes. The incremental reduction of all water demands on the system will continue until inflows are restored to a point where the East Fork and West Fork lake levels return to their Normal Operating Ranges.

Key Facts and Assumptions

1. Minimum Flows in Bypassed Stream Reaches – Assume the new license for the East Fork Project will include the following normal requirements for minimum releases from hydro project works into bypassed stream reaches to enhance water quality and/or aquatic species habitat:
   a. Wolf Creek Bypassed Reach – 6 cfs continuous release from a valve to be installed at Wolf Creek Dam.

2. Minimum Flows in the Tuckasegee River Main Stem – Assume that the new licenses for the East Fork and West Fork projects will include the following minimum flow requirements for the main stem of the Tuckasegee River:
   a. 30 cfs combined minimum flow from December 1 through June 30 (assuming inflow into Tuckasegee Lake is greater than or equal to 20 cfs) and provided by the same means as the existing provision:
      - Continue existing minimum flow at Tuckasegee (20 cfs or inflow, whichever is less).
      - Continue existing minimum flow at Cedar Cliff (10 cfs from a valve at the hydro station during non-generation hours only). When Cedar Cliff Powerhouse is generating, the minimum flow valve is turned off.
   b. 55 cfs combined minimum flow from July 1 through November 30 (assuming inflow into Tuckasegee Lake is greater than or equal to 20 cfs) and provided by:
      i) Continue existing minimum flow at Tuckasegee (20 cfs or inflow, whichever is less).
      ii) Increase the minimum flow valve capacity at Cedar Cliff and provide 35 cfs minimum flow during non-generation hours only. When Cedar Cliff Powerhouse is generating, the minimum flow valve is turned off.

3. Generation Releases for Angling and Boating Recreation Flows – Assume the new licenses for the East Fork and West Fork projects will include the following Normal Generation Schedule to Support Recreation on the main stem of the Tuckasegee River from the Cedar Cliff and Thorpe / Tuckasegee Powerhouses, with all releases being at or above the Best Efficiency Flows for the subject hydro units:

   a. **Primary Angling Periods**

      i) Defined - The first weekend after Labor Day through the last weekend of October and April 1st through the first weekend of June are defined as primary angling periods with actual flows at or below about 500 cfs being preferred (as measured at the reactivated or replaced USGS gage at Dillsboro).

      ii) During part of this time period, boating release schedules overlap. During this overlap period (the Saturday that occurs nine days before Memorial Day through the first weekend of June and Saturdays in September and October), the Normal Generation Schedule to Support Recreation will be:

         (1) West Fork Release: Saturday and Sunday one week prior to Memorial Day weekend, Saturday and Monday of Memorial Day weekend and three of four Saturdays in September and October, plus Tuesday, Friday and Saturday for the period between Memorial Day weekend through the first weekend in June, each for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

         (2) East Fork Release: Sunday of Memorial Day weekend plus Wednesday, Thursday and Sunday for the period between Memorial Day weekend through the first weekend in June and one of four Saturdays in September and October, each for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

b. **Primary Boating Periods**

i) Defined – The period after the first weekend of June through Labor Day is defined as the primary boating period, with actual flows at about 800 cfs (as measured at the reactivated or replaced USGS gage at Dillsboro) being preferred.

ii) During this time period, the Normal Generation Schedule to Support Recreation for three out of four weeks will be:

(1) West Fork Release: Tuesday, Friday and Sunday for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

(2) East Fork Release: Wednesday, Thursday and Saturday plus the Monday of Labor Day weekend for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

iii) During this time period, the Normal Generation Schedule to Support Recreation for one out of four weeks will be:

(1) West Fork Release: Tuesday, Friday and Saturday for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

(2) East Fork Release: Wednesday, Thursday and Sunday for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

c. **Adjusting for Significant Baseline Flows -** The Licensee will check the river flow daily at the reactivated Dillsboro USGS Gage #03510500 (or a suitable replacement gage in this vicinity as determined by USGS) and by doing so, the Licensee can project the expected river flow at the Dillsboro Gage during the next scheduled generation release to support recreation. When projected baseline river flow (i.e. the flow rate at the Dillsboro USGS gage without the Licensee making the scheduled generation release to support recreation) is expected to average

more than 500 cfs over the period from 10:30 AM to 4:30 PM, specific recreation flow releases from the DPNA hydropower stations can be reduced or stopped.

d. **Other Special Events -** Other requests for special generation releases that require additional generation hours above the total number of hours in any given month in the Normal Generation Schedule to Support Recreation will be handled on a case-by-case basis. To the maximum practical extent, releases will be integrated with the normal release schedule so that additional release hours beyond the normal release schedule are not needed.

4. Bypass Flow Releases for Recreation – Assume the new license for the West Fork Project will include the following requirements for scheduled releases from Glenville Dam into the West Fork (Glenville) Bypassed Reach to enhance downstream recreation:

   a. Release water for six hours per day for one weekend (Saturday and Sunday) per calendar year in April. Target flowrate will be approximately 250 cfs each day and releases made to arrive at the put-in point at 10:00 AM.

   b. Provide five total weekend day releases per calendar year for six hrs per day, scheduled on weekend days in the months of May through September. Target flowrate will be approximately 250 cfs each day and releases made to arrive at the put-in point at 10:00 AM.

   c. Target Flowrates - The target flowrates stated above are for flowrates at the put-in point. Actual release amounts from the Tainter gate need to be large enough that when combined with other tributary and accretion flows, the total is as close as possible to the target flowrates.

5. Normal 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 any fuse plugs or 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 Normal Full Pond Elevation for all of its reservoirs as equal to 100.0 ft relative.

Normal Full Pond Elevations for East Fork and West Fork Project Reservoirs:

Hydro Project	Reservoir	Normal Full Pond Elevation (Ft above Mean Sea Level)
East Fork	Wolf Creek	3080.0
	Tanasee Creek	3080.0
	Bear Creek	2560.0
	Cedar Cliff	2330.0
West Fork	Glenville	3491.7
	Tuckasegee	2278.75

6. 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 inflows and outflows 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.

7. 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 inflows and outflows 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. (Note: See Item 16 below for special drought storage considerations).

8. 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 or Hydro Project Maintenance & Emergency Protocol. 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.

9. Normal Operating Range for Lake Levels – 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, and that range is bounded by a Normal Maximum Elevation and a Normal Minimum Elevation. If inflows and outflows 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. (Note: See Item 16 below for special drought storage considerations). Assume the new licenses for the East Fork and West Fork Projects will include requirements for the following Normal Operating Ranges (Note: All lake levels are for the first day of the month. Levels for other days of the month can be determined by linear interpolation):

a. **Lake Glenville – Maintain the following Normal Operating Range:**

Month	Normal Minimum Elevation (ft)	Normal Target Elevation (ft)	Normal Maximum Elevation (ft)
Jan	85	90	94
Feb	85	90	94
Mar	88	91	94
Apr	90	93	96
May	95	97	99
Jun	95	97	99
Jul	95	97	99
Aug	93	95	98
Sep	90	93	94
Oct	90	93	94
Nov	86	90	94
Dec	85	90	94

b. **Tanasee Creek & Wolf Creek Lakes – Maintain the following Normal Operating Range:**

Month	Normal Minimum Elevation (ft)	Normal Target Elevation (ft)	Normal Maximum Elevation (ft)
Jan	83	85	92
Feb	83	85	92
Mar	83	85	92
Apr	86	88	96
May	90	93	100
Jun	90	93	100
Jul	90	93	100
Aug	90	93	100
Sep	90	93	100
Oct	90	93	100
Nov	86	88	96
Dec	83	85	92

c. **Bear Creek Lake – Maintain the following Normal Operating Range:**

Month	Normal Minimum Elevation (ft)	Normal Target Elevation (ft)	Normal Maximum Elevation (ft)
Jan	91	93	98
Feb	91	93	98
Mar	91	93	98
Apr	92	95	98
May	92	98	100
Jun	92	98	100
Jul	92	98	100
Aug	92	98	100
Sep	92	98	100
Oct	92	96	98
Nov	92	95	98
Dec	92	94	98

d. **Cedar Cliff Lake – Maintain the following Normal Operating Range:**

Month	Normal Minimum Elevation (ft)	Normal Target Elevation (ft)	Normal Maximum Elevation (ft)
Jan	96	98	100
Feb	96	98	100
Mar	96	98	100
Apr	96	98	100
May	96	98	100
Jun	96	98	100
Jul	96	98	100
Aug	96	98	100
Sep	96	98	100
Oct	96	98	100
Nov	96	98	100
Dec	96	98	100

e. **Tuckasegee Lake – Maintain lake level as needed to provide minimum flow.**

10. Net inflow – The cumulative inflow into a reservoir, usually expressed in ac-ft per week or ac-ft per month that is available for generation of hydroelectricity or for supplying non-generation water demands. Net inflow is the sum of tributary stream

flow, groundwater runoff, precipitation falling on the reservoir surface, surface runoff and point-source discharge flows, less the sum of net on-reservoir water withdrawals, groundwater recharge and evaporation.

11. Normal Minimum Generation Volume – the minimum amount of net inflow, expressed in ac-ft per month, ac-ft per week or MWH of electric generation per week that is normally reserved in a hydro reservoir for release through the hydro turbines, producing hydroelectricity. For purposes of this low inflow protocol, the following are the Normal Minimum Generation Volumes for the East Fork and West Fork projects combined:

Combined Normal Minimum Generation Volume for East Fork and West Fork Projects	
Period	**(MWH / week)**
Nov-Apr	893
May (First two weeks only)	893
May (Week before Memorial Day only)	1158
May – Jun (Week after Memorial Day only)	1360
Remainder of Jun-Aug	1897
Sep (Labor Day through the following Saturday)	1228
Sep (2nd and 3rd weeks only)	1025
Sep (4th week only)	1095
Oct (First three weeks only)	1025
Oct (4th week only)	1095

Note: The above Normal Minimum Generation Volumes include both the energy produced by the hydro turbines during generation releases to support downstream

recreation as well as energy produced during other periods of unit dispatch to meet the Licensee's electric customers' needs. To the maximum practical extent, when the weekly minimum generation volumes are reduced in the LIP, the reductions will be shared equally between the MWH/week that are reserved to make generation releases to support downstream recreation and generation releases (i.e. dispatch) to support electric customers' needs.

12. Threshold Minimum Flows – the minimum flow release amounts from hydro project works that may be necessary to sustain aquatic communities consistent with the resource management goals and objectives for the affected stream reaches. Since the normal minimum flow releases are for water quality and / or aquatic species habitat enhancements, the Threshold Minimum Flows are related to and lower than the normal minimum flow releases required by the FERC license. For the purposes of this protocol, it is assumed that the Threshold Minimum Flows are as follows:
    a. Wolf Creek Bypassed Reach - 2 cfs or inflow into Wolf Creek Lake, whichever is less, released from Wolf Creek Dam into the Wolf Creek Bypassed Reach.
    b. Main Stem of the Tuckasegee River – the normal minimum flow provided from Tuckasegee Dam (i.e. 20 cfs or inflow into Tuckasegee Lake, whichever is less) plus the following minimum flows provided from the Cedar Cliff Spill Valve during periods of non-generation from Cedar Cliff Hydro Station:
        i) From December 1 through June 30 – 6 cfs
        ii) From July 1 through November 30 – 11 cfs.

13. Simultaneous Reductions of Minimum Flows – when making reductions in minimum flows, the Licensee will make simultaneous reductions in the Wolf Creek Bypassed Reach and on the main stem with each stage of the Low Inflow Protocol.

14. Normal Minimum Non-Generation Volume – the minimum amount of net inflow, usually expressed in ac-ft per month or ac-ft per week that is normally reserved in a hydro reservoir to account for the portion of net inflow that leaves the reservoir without producing hydroelectricity. Examples include leakage from the main dam(s), diversion dam(s), penstock(s) or hydro turbine(s) into surface water; releases from flood, sluice and trash gates; and releases from minimum flow devices.

15. Low inflow period - any period when net inflow to a reservoir is not sufficient to maintain the reservoir's elevation above the Normal Minimum Elevation, while still providing the Normal Minimum Generation Volume, and the Normal Minimum Non-Generation Volume.

16. Drought Storage Considerations - the Licensee will be allowed to raise the reservoirs to levels above the Normal Maximum Elevation when water is available during periods of extended drought.

17. Threshold Bypass Whitewater Recreation Release – the duration and target flowrate below which Tainter gate releases in the bypassed reach to support whitewater boating can no longer achieve their intended purpose due to very short run times or too much contact with the riverbed. For the purpose of this protocol, the Threshold Bypass Whitewater Recreation Release is 200 cfs (target flowrate at the put-in point) for two hours duration. If there is a 2-hr release planned for each of two consecutive days, then it's preferable to have a single 4-hr release rather than two, 2-hr releases.

18. Important Lake Levels for Tainter Gate and Minimum Flow Operation – Lake levels could possibly be lowered to the point where lake level is below the levels needed to allow bypass flows for recreation purposes or minimum flows. The important lake levels for these uses are:

Hydro Project	Lake	Relative Elevation of the Tainter Gate Sill (ft with 100.0 = full pond)	Relative Elevation at Which Normal Minimum Flow Device No Longer Works (ft with 100.0 = full pond)
East Fork	Wolf Creek / Tanasee Creek	81.0	81.0 (assumed)
	Bear Creek	75.0	N/A
	Cedar Cliff	75.0	N/A
West Fork	Glenville	88.5	N/A
	Tuckasegee	97.0 (flashboards and trash sluice gate)	97.0

19. Relative Storage Amounts Available – The following are the approximate surface areas and storage amounts available in each lake:

Hydro Project	Lake	Relative Elevation (ft)	Lake Surface Area (ac)	Storage Volume (ac-ft)
East Fork	Wolf Creek / Tanasee Creek	100.0	223	11,407
		81.0	144	7600
	Bear Creek	100.0	476	34,715
		75.0	385	23,620
	Cedar Cliff	100.0	121	6319
		75.0	79	3742
West Fork	Glenville	100.0	1462	72,000
		88.5	1290	55,600
	Tuckasegee	100.0	8	35
		97.0	-	15

Notes:

a. Cedar Cliff Lake and Tuckasegee Lake have limited storage and the amount of water in the reservoirs changes very quickly, depending on operation of the upstream hydro station. Therefore, these two reservoirs do not provide reliable storage.

b. Lake Glenville has roughly twice the storage volume per foot of lake depth as do Wolf Creek Lake, Tanasee Creek Lake and Bear Creek Lake combined. Therefore, lake level reduction increments of two ft for the larger East Fork reservoirs and one foot for West Fork (Lake Glenville) are appropriate.

20. Priority of Reducing Tainter Gate Releases for Whitewater Recreation – when making reductions in Tainter gate releases for whitewater recreation in the West Fork (Glenville) Bypassed Reach, the duration of the release should be reduced first until it reaches the above stated threshold duration, then the target flowrates should be reduced until the threshold flowrate is reached.

21. Relationship Between this Protocol and the Hydro Project Maintenance & Emergency Protocol (HPMEP) – The HPMEP outlines the general approach the Licensee will take under certain emergency and equipment failure and maintenance situations to continue practical and safe operation of the hydro project, to mitigate any related impacts to license conditions and to communicate with resource agencies and the affected parties. Under the HPMEP, temporary modifications of minimum flow releases in bypassed stream reaches, generation releases, Tainter gate releases for recreation and the lake level operating range are allowed. Lowering levels of East Fork and West Fork Project reservoirs caused by situations addressed under the HPMEP will not invoke implementation of this Low Inflow Protocol (LIP). Also, if the LIP has already been implemented at the time that a situation covered by the HPMEP is initiated, the Licensee will typically suspend implementation of the LIP until the HPMEP situation has been eliminated. The Licensee may however choose to continue with the LIP if desirable.

22. Organizational abbreviations include the NC Division of Water Resources (NCDWR), NC Wildlife Resources Commission (NCWRC), United States Forest Service (USFS), United States Fish & Wildlife Service (USFWS), the Tuckasegee Gorge Association (TGA), United States Geological Survey (USGS) and the American Whitewater Affiliation (AW).

23. Safety and Electric System Integrity 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 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.

Procedure

During low inflow periods as defined above, the Licensee will follow the protocol set forth below for the East Fork and West Fork Projects regarding adjustments to generation amounts, minimum flow releases, Tainter gate releases for recreation and minimum reservoir elevations and will make the adjustments set forth below on a **weekly** basis so as to equitably allocate the impacts of reduced water availability:

Stage 1 Reductions:

1. Upon a determination by the Licensee that the reservoir elevations for either (a) Lake Glenville, or (b) Bear Creek Lake and Wolf Creek / Tanasee Creek lakes cannot be maintained at or above their Normal Minimum Elevations for the time of year specified above, the Licensee will reduce the minimum generation volume to a lower amount (referred to as the Stage 1 Minimum Generation Volume and expressed in MWH/wk) as determined below:

Stage 1 Minimum Generation Volumes for East Fork and West Fork

Period	Normal Min. Gen. Volume for East Fork and West Fork Projects Combined (MWH / week)	Stage 1 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
November -April	893	781	12.5
May (First two weeks only)	893	781	12.5
May (Week before Memorial Day only)	1158	1024	11.5
May – June (Week after Memorial Day only)	1360	1210	11.1
Remainder of June-August	1897	1702	10.3
September (Labor Day through the following Saturday)	1228	1088	11.4
September (2nd and 3rd weeks only)	1025	903	12.0
September (4th week only)	1095	967	11.7
October (First three weeks only)	1025	903	12.0
October (4th week only)	1095	967	11.7

Note: The above reductions in generation from the normal schedules represent a ½ hour per day reduction in hours of generation from each powerhouse for the Licensee's dispatch periods, except at Tennessee Creek, where the reduction will be 1 hour per day. For periods where

downstream recreation flow releases are scheduled, the reduction represents a ½ hour per day reduction during the recreation flow release period.

2. At the same time, the Licensee will reduce the combined minimum flow in the Main Stem below Cedar Cliff and Tuckasegee as follows:

Period	**Normal combined minimum flow in Main Stem (cfs)**	**Stage 1 combined minimum flow in Main Stem*(cfs)**	**Total % Reduction From Normal**
December-June	Tuckasegee-20 Cedar Cliff-10	Tuckasegee-20 Cedar Cliff-6	13.3
July-November	Tuckasegee-20 Cedar Cliff-35	Tuckasegee-20 Cedar Cliff-27	14.5

Note: * Cedar Cliff Minimum Flow is at its Threshold Level in December through June.

3. At the same time, the Licensee will reduce the minimum flow release from Wolf Creek Dam to 5 cfs. This reduction represents a 16.7% reduction.
4. At the same time, the Licensee will reduce the Bear Creek, and Wolf Creek / Tanasee Creek Lakes' Normal Minimum Elevations by two feet and Lake Glenville's Normal Minimum Elevation by one foot for the relevant time period as shown above. The newly modified minimum elevations are referred to as the Stage 1 Minimum Elevations. Note however that in order to maintain minimum flow in the Wolf Creek Bypassed Reach, this Stage 1 Minimum Elevation for the Wolf Creek / Tanasee Creek lakes must not be reduced below 81.0 ft.
5. At the same time, if recreation releases from the Glenville Dam are scheduled during Stage 1 reductions, then the releases will be reduced as noted below:

Tainter Gate Release	Normally Scheduled Duration and Target Flowrates (hrs and cfs)	Stage 1 Duration and Target Flowrates (hrs and cfs)	% Reduction From Normal Water Volume Used
Spring Weekend in April	Saturday-6-hr release @ 250 cfs Sunday - 6-hr release @ 250 cfs	Saturday - 5-hr release @ 250 cfs Sun. - 5-hr release @ 250 cfs	16.7
Summertime Weekend Days in May through September	6-hr release @ 250 cfs	5-hr release @ 250 cfs	16.7

6. The Licensee will directly notify NCDWR, NCWRC, USFWS and the USFS when Stage 1 reductions are implemented. If these Stage 1 reductions occur in December through June, the Licensee will note to the agencies that the minimum flow from Cedar Cliff is at its Threshold Level for this time of year. The TGA President and the AW representative will be added to this notification when the angling and boating recreation flows or bypass flow releases for recreation are affected during this stage. The Licensee will endeavor in good faith to provide at least 24 hours advance notification.

7. The Licensee will update its website and telephone messages to account for the impacts of the above LIP on schedules for generation and bypass recreational releases and lake levels.

Stage 2 Reductions

1. Upon a determination by the Licensee that the reservoir elevations for either (a) Lake Glenville, or (b) Bear Creek Lake and Wolf Creek / Tanasee Creek lakes cannot be

maintained at or above the Stage 1 Minimum Elevations specified above, the Licensee will reduce the minimum generation volume to a lower amount (referred to as the Stage 2 Minimum Generation Volume and expressed in MWH/wk) as determined below:

Period	**Normal Min. Gen. Volume for East Fork and West Fork Projects Combined (MWH / week)**	**Stage 2 Min. Generation Volume (MWH/wk)**	**% Reduction From Normal Water Volume Used**
Nov-Apr	893	670	25.0
May (First two weeks only)	893	670	25.0
May (Week before Memorial Day only)	1158	891	23.1
May – Jun (Week after Memorial Day only)	1360	1059	22.1
Remainder of Jun-Aug	1897	1507	20.6
Sep (Labor Day through the following Saturday)	1228	949	22.7
Sep (2nd and 3rd weeks only)	1025	780	23.9
Sep (4th week only)	1095	838	23.5
Oct (First three weeks only)	1025	780	23.9
Oct (4th week only)	1095	838	23.5

Note: The above reductions in generation from the normal schedules represent a 1 hour per day

reduction in hours of generation from each powerhouse for the Licensee's dispatch periods, except at Tennessee Creek, where the reduction will be 2 hours per day. For periods where downstream recreation flow releases are scheduled, the reduction represents a 1 hour per day reduction during the recreation flow release period.

2. At the same time, the Licensee will reduce the combined minimum flow in the Main Stem below Cedar Cliff and Tuckasegee as follows:

Period	**Normal combined minimum flow in Main Stem (cfs)**	**Stage 2 combined minimum flow in Main Stem (*)(cfs)**	**Total % Reduction From Normal**
December-June	Tuckasegee-20 Cedar Cliff-10	Tuckasegee-20 Cedar Cliff-6	13.3
July-November	Tuckasegee-20 Cedar Cliff-35	Tuckasegee-20 Cedar Cliff-19	29

Note: * Cedar Cliff Minimum Flow is at its Threshold Level in December through June.

3. At the same time, the Licensee will reduce the minimum flow release from Wolf Creek Dam to 4 cfs. This reduction represents a 33.3% reduction from the normal minimum flow release.

4. At the same time, the Licensee will reduce the Bear Creek and Wolf Creek / Tanasee Creek Lakes' minimum elevations by two additional feet (four feet below the Normal Minimum Elevations) and Lake Glenville's minimum elevation by one additional foot (two feet below the Normal Minimum Elevation) for the relevant time period as shown above. The newly modified minimum elevations are referred to as the Stage 2 Minimum Elevations. Note however that in order to maintain minimum flow in the

Wolf Creek Bypassed Reach, this Stage 2 Minimum Elevation for the Wolf Creek / Tanasee Creek lakes must not be reduced below 81.0 ft.

5. At the same time, if recreation releases from the Glenville Dam are scheduled during Stage 2 reductions and if the Stage 2 Minimum Elevation for Lake Glenville is at or above 88.5 ft (i.e. the minimum lake level needed to allow releasing water from a Tainter gate), then the releases will be reduced as noted below; otherwise, any scheduled Tainter gate releases to support whitewater recreation in the West Fork (Glenville) Bypassed Reach will be cancelled:

Tainter Gate Release	**Normally Scheduled Duration and Target Flowrates (hrs and cfs)**	**Stage 2 Duration and Target Flowrates (hrs and cfs)**	**% Reduction From Normal Water Volume Used**
Spring Weekend in April	Sat. - 6-hr release @ 250 cfs Sun. - 6-hr release@ 250 cfs	Sat. - 4-hr release @ 250 cfs Sun.-4-hr release@ 250 cfs	33.3
Summertime Weekend Days in May, June, July, August, September	6-hr release @ 250 cfs	4-hr release @ 250 cfs	33.3

6. The Licensee will directly notify the TGA President and the AW representative when Stage 2 reductions are implemented if the angling and boating recreation flows or bypass flow releases for recreation will be affected during this stage. The Licensee will endeavor in good faith to provide at least 24 hours advance notification.

7. The Licensee will update its website and telephone messages to account for the impacts of the above LIP on schedules for generation and bypass recreational releases and lake levels.

Stage 3 Reductions

1. Upon a determination by the Licensee that the reservoir elevations for either (a) Lake Glenville, or (b) Bear Creek Lake and Wolf Creek / Tanasee Creek lakes cannot be maintained at or above the Stage 2 Minimum Elevations specified above, the Licensee will reduce the minimum generation volume to a lower amount (referred to as the Stage 3 Minimum Generation Volume and expressed in MWH/wk) as determined below:

Period	Normal Min. Gen. Volume for East Fork and West Fork Projects Combined (MWH / week)	Stage 3 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
Nov-Apr	893	558	37.5
May (First two weeks only)	893	558	37.5
May (Week before Memorial Day only)	1158	757	34.6
May – Jun (Week after Memorial Day only)	1360	909	33.2
Remainder of Jun-Aug	1897	1311	30.9
Sep (Labor Day through the following Saturday)	1228	809	34.1
Sep (2nd and 3rd weeks only)	1025	657	35.9
Sep (4th week only)	1095	710	35.2
Oct (First three weeks only)	1025	657	35.9
Oct (4th week only)	1095	710	35.2

Note: The above reductions in generation from the normal schedules represent a 1½ hour per day reduction in hours of generation from each powerhouse for the Licensee's dispatch periods, except at Tennessee Creek, where the reduction will be 3 hours per day. For periods where downstream recreation flow releases are scheduled, the reduction represents a 1½ hours per day reduction during the recreation flow release period.

2. At the same time, the Licensee will reduce the combined minimum flow in the Main Stem below Cedar Cliff and Tuckasegee as follows:

Period	**Normal combined minimum flow in Main Stem (cfs)**	**Stage 3 combined minimum flow in Main Stem (*)(cfs)**	**Total % Reduction From Normal**
December-June	Tuckasegee-20 Cedar Cliff-10	Tuckasegee-20 Cedar Cliff-6	13.3
July-November	Tuckasegee-20 Cedar Cliff-35	Tuckasegee-20 Cedar Cliff-11	43.6

Note: * Cedar Cliff Minimum Flow is at its Threshold Level all year.

3. At the same time, the Licensee will reduce the minimum flow release from Wolf Creek Dam to 3 cfs. This reduction represents a 50 % reduction from normal minimum flow release.

4. At the same time, the Licensee will reduce the Bear Creek and Wolf Creek / Tanasee Creek Lakes' minimum elevations by two additional feet (six feet below the Normal Minimum Elevations) and Lake Glenville's minimum elevation by one additional foot (three feet below the Normal Minimum Elevation) for the relevant time period as shown above. The newly modified minimum elevations are referred to as the Stage 3 Minimum Elevations. Note however that in order to maintain minimum flow in the

Wolf Creek Bypassed Reach, this Stage 3 Minimum Elevation for the Wolf Creek / Tanasee Creek lakes must not be reduced below 81.0 ft.

5. At the same time, if recreation releases from the Glenville Dam are scheduled during Stage 3 reductions and if the Stage 3 Minimum Elevation for Lake Glenville is at or above 88.5 ft (i.e. the minimum lake level needed to allow releasing water from a Tainter gate), then the releases will be reduced as noted below; otherwise, any scheduled Tainter gate releases to support whitewater recreation in the West Fork (Glenville) Bypassed Reach will be cancelled:

Tainter Gate Release	**Normally Scheduled Duration and Target Flowrates (*) (hrs and cfs)**	**Stage 3 Duration and Target Flowrates (*) (hrs and cfs)**	**% Reduction From Normal Water Volume Used**
Spring Weekend in April	Sat. - 6-hr release @ 250 cfs Sun. - 6-hr release@ 250 cfs	Sat. – 3 hr release @ 250 cfs Sun.- 3-hr release@ 250 cfs	50
Summertime Weekend Days in May, June, July, August, September	6-hr release @ 250 cfs	3-hr release @ 250 cfs	50

6. The Licensee will directly notify the TGA President and the AW representative when Stage 3 reductions are implemented if the angling and boating recreation flows or bypass flow releases for recreation will be affected during this stage. If these Stage 3 reductions occur in July through November, the Licensee will also notify the NCDWR, NCWRC, USFWS and the USFS that the minimum flow from Cedar Cliff is at its Threshold Level year-round. The Licensee will endeavor in good faith to provide at least 24 hours advance notification.

7. The Licensee will update its website and telephone messages to account for the impacts of the above LIP on schedules for generation and bypass recreational releases and lake levels.

Stage 4 Reductions

1. Upon a determination by the Licensee that the reservoir elevations for either (a) Lake Glenville, or (b) Bear Creek Lake and Wolf Creek / Tanasee Creek lakes cannot be maintained at or above the Stage 3 Minimum Elevations specified above, the Licensee will reduce the minimum generation volume to a lower amount (referred to as the Stage 4 Minimum Generation Volume and expressed in MWH/wk) as determined below:

Period	Normal Min. Gen. Volume for East Fork and West Fork Projects Combined (MWH / week)	Stage 4 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
Nov-Apr	893	446	50
May (First two weeks only)	893	446	50
May (Week before Memorial Day only)	1158	623	46.2
May – Jun (Week after Memorial Day only)	1360	758	44.3
Remainder of Jun-Aug	1897	1116	41.2
Sep (Labor Day through the following Saturday)	1228	670	45.5

Period	Normal Min. Gen. Volume for East Fork and West Fork Projects Combined (MWH / week)	Stage 4 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
Sep (2nd and 3rd weeks only)	1025	535	47.8
Sep (4th week only)	1095	581	46.9
Oct (First three weeks only)	1025	535	47.8
Oct (4th week only)	1095	581	46.9

Note: The above reductions in generation from the normal schedules represent a 2 hour per day reduction in hours of generation from each powerhouse for the Licensee's dispatch periods, except at Tennessee Creek, where the reduction will be 4 hours per day. For periods where downstream recreation flow releases are scheduled, the reduction represents a 2 hours per day reduction during the recreation flow release period.

2. At the same time, the Licensee will maintain the combined minimum flow in the Main Stem below Cedar Cliff and Tuckasegee at the Threshold Levels as noted in Stage 3 above.

3. At the same time, the Licensee will reduce the minimum flow release from Wolf Creek Dam to the Threshold Minimum Flow of 2 cfs for the Wolf Creek Bypassed Reach. This reduction represents a 66.7 % reduction from normal minimum flow release.

4. At the same time, the Licensee will reduce the Bear Creek and Wolf Creek / Tanasee Creek Lakes' minimum elevations by two additional feet (eight feet below the Normal Minimum Elevations) and Lake Glenville's minimum elevation by one additional foot (four feet below the Normal Minimum Elevation) for the relevant time period as shown above. The newly modified minimum elevations are referred to as the Stage 4 Minimum Elevations. Note however that in order to maintain minimum flow in the Wolf Creek Bypassed Reach, this Stage 4 Minimum Elevation for the Wolf Creek / Tanasee Creek lakes must not be reduced below 81.0 ft.

5. At the same time, if recreation releases from the Glenville Dam are scheduled during Stage 4 reductions and if the Stage 4 Minimum Elevation for Lake Glenville is at or above 88.5 ft (i.e. the minimum lake level needed to allow releasing water from a Tainter gate), then the releases will be reduced as noted below; otherwise, any scheduled Tainter gate releases to support whitewater recreation in the West Fork (Glenville) Bypassed Reach will be cancelled:

Tainter Gate Release	**Normally Scheduled Duration and Target Flowrates (hrs and cfs)**	**Stage 4 Duration and Target Flowrates (hrs and cfs)**	**% Reduction From Normal Water Volume Used**
Spring Weekend in April	Sat. - 6-hr release @ 250 cfs Sun. - 6-hr release@ 250 cfs	Sat. – 4 hr release @ 250 cfs Sun.- No release	66.7
Summertime Weekend Days in May, June, July, August, September	6-hr release @ 250 cfs	2-hr release @ 250 cfs	66.7

6. The Licensee will directly notify the TGA President and the AW representative when Stage 4 reductions are implemented if the angling and boating recreation flows or bypass flow releases for recreation will be affected during this stage. The Licensee will also notify the NCDWR, NCWRC, USFWS and the USFS that the minimum flow from Wolf Creek Dam is at its Threshold Level. The Licensee will endeavor in good faith to provide at least 24 hours advance notification.

7. The Licensee will update its website and telephone messages to account for the impacts of the above LIP on schedules for generation and bypass recreational releases and lake levels.

Stage 5 Reductions

1. Upon a determination by the Licensee that the reservoir elevations for either (a) Lake Glenville, or (b) Bear Creek Lake and Wolf Creek / Tanasee Creek lakes cannot be maintained at or above the Stage 4 Minimum Elevations specified above, the Licensee will reduce the minimum generation volume to a lower amount (referred to as the Stage 5 Minimum Generation Volume and expressed in MWH/wk) as determined below:

Period	Normal Min. Gen. Volume for East Fork and West Fork Projects Combined (MWH / week)	Stage 5 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
Nov-Apr	893	335	62.5
May (First two weeks only)	893	335	62.5
May (Week before	1158	467	59.6

Period	Normal Min. Gen. Volume for East Fork and West Fork Projects Combined (MWH / week)	Stage 5 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
Memorial Day only)			
May – Jun (Week after Memorial Day only)	1360	569	58.2
Remainder of Jun-Aug	1897	921	51.5
Sep (Labor Day through the following Saturday)	1228	530	56.8
Sep (2nd and 3rd weeks only)	1025	412	59.8
Sep (4th week only)	1095	453	58.7
Oct (First three weeks only)	1025	412	59.8
Oct (4th week only)	1095	453	58.7

Note: The above reductions in generation from the normal schedules represent a 2½ hour per day reduction in hours of generation from each powerhouse for the Licensee's dispatch periods, except at Tennessee Creek, where the reduction will be 5 hours per day. For periods where downstream recreation flow releases are scheduled, the reduction represents a 2½ hours per day reduction during the recreation flow release period.

2. At the same time, the Licensee will maintain the combined minimum flow in the Main Stem below Cedar Cliff and Tuckasegee at the Threshold Levels as noted in Stage 3 above.

3. At the same time, the Licensee will maintain the minimum flow release from Wolf Creek Dam at the Threshold Level of 2 cfs.

4. At the same time, the Licensee will reduce the Bear Creek and Wolf Creek / Tanasee Creek Lakes' minimum elevations by two additional feet (ten feet below the Normal Minimum Elevations) and Lake Glenville's minimum elevation by one additional foot (five feet below the Normal Minimum Elevation) for the relevant time period as shown above. The newly modified minimum elevations are referred to as the Stage 5 Minimum Elevations. Note however that in order to maintain minimum flow in the Wolf Creek Bypassed Reach, this Stage 5 Minimum Elevation for the Wolf Creek / Tanasee Creek lakes must not be reduced below 81.0 ft.

5. At the same time, if recreation releases from the Glenville Dam are scheduled during Stage 5 reductions and if the Stage 5 Minimum Elevation for Lake Glenville is at or above 88.5 ft (i.e. the minimum lake level needed to allow releasing water from a Tainter gate), then the releases will be reduced as noted below; otherwise, any scheduled Tainter gate releases to support whitewater recreation in the West Fork (Glenville) Bypassed Reach will be cancelled:

Tainter Gate Release	**Normally Scheduled Duration and Target Flowrates (hrs and cfs)**	**Stage 5 Duration and Target Flowrates (hrs and cfs) (*)**	**% Reduction From Normal Water Volume Used**
Spring Weekend in April	Sat. - 6-hr release @ 250 cfs Sun. - 6-hr release@ 250 cfs	Sat. – 4 hr release @ 200 cfs Sun.- No release	73.3
Summertime Weekend Days in May, June, July, August, September	6-hr release @ 250 cfs	2-hr release @ 200 cfs	73.3

Note: * Both the duration and flowrates for Tainter gate releases to support whitewater recreation are at their Threshold Levels.

6. The Licensee will directly notify the TGA President and the AW representative when Stage 5 reductions are implemented if the angling and boating recreation flows or bypass flow releases for recreation will be affected during this stage. The Licensee will endeavor in good faith to provide at least 24 hours advance notification.

7. The Licensee will update its website and telephone messages to account for the impacts of the above LIP on schedules for generation and bypass recreational releases and lake levels.

Stage 6 Reductions and Beyond

1. Upon a determination by the Licensee that the reservoir elevations for either (a) Lake Glenville, or (b) Bear Creek Lake and Wolf Creek / Tanasee Creek lakes cannot be maintained at or above the Stage 5 Minimum Elevations specified above, the Licensee will reduce the minimum generation volume to a lower amount (referred to as the Stage 6 Minimum Generation Volume and expressed in MWH/wk) as determined below. Also note that for all stages beyond Stage 6, the Minimum Generation Volumes will stay constant at this Stage 6 level:

Period	Normal Min. Gen. Volume for East Fork and West Fork Projects Combined (MWH / week)	Stage 6 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
Nov-Apr	893	223	75
May (First two weeks only)	893	223	75
May (Week before Memorial Day only)	1158	378	67.4

Period	Normal Min. Gen. Volume for East Fork and West Fork Projects Combined (MWH / week)	Stage 6 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
May – Jun (Week after Memorial Day only)	1360	496	63.5
Remainder of Jun-Aug	1897	725	61.8
Sep (Labor Day through the following Saturday)	1228	391	68.2
Sep (2nd and 3rd weeks only)	1025	290	71.8
Sep (4th week only)	1095	324	70.4
Oct (First three weeks only)	1025	290	71.8
Oct (4th week only)	1095	324	70.4

Note: The above reductions in generation from the normal schedules represent a 3 hour per day reduction in hours of generation from each powerhouse for the Licensee's dispatch periods, except at Tennessee Creek, where the reduction will be 6 hours per day. For periods where downstream recreation flow releases are scheduled, the reduction represents a 3 hours per day reduction during the recreation flow release period.

2. If recreation releases from the Glenville Dam are scheduled during Stage 6 and beyond, they will be held constant at the Threshold Levels as noted in the Stage 5 reductions above until the reduced minimum lake elevation for Lake Glenville falls below 88.5 ft (i.e. the minimum lake level needed to allow releasing water from a Tainter gate), at which point the releases will be cancelled.

3. At the same time, the Licensee will maintain the combined minimum flow in the Main Stem below Cedar Cliff and Tuckasegee at the threshold minimum flows as noted in Stage 3 above.

4. Once the minimum generation has been reduced to Stage 6 and beyond, all Glenville Dam Tainter gate releases for recreation have been cancelled and all main stem minimum flows are being maintained at the threshold minimum flows, the minimum lake elevation requirements for Lake Glenville and Bear Creek Lake will no longer apply. Note however that in order to maintain minimum flow in the Wolf Creek Bypassed Reach, the minimum elevation for Wolf Creek / Tanasee Creek lakes must not be reduced below 81.0 ft.

5. The Licensee will update its website and telephone messages to account for the impacts of the above LIP on schedules for generation and bypass recreational releases and lake levels.

Recovery from the Low Inflow Protocol

1. When inflows have increased to a point where the Licensee can maintain lake level above the minimum elevation established in the previous stage reduction, operation of the projects can begin transitioning out of the LIP. The transitioning procedure will follow the stage reductions outlined above in reverse order (i.e. “stage increases” going from the last stage achieved back toward Stage 1 and then finally returning to normal operation).

2. The Licensee will perform the direct notifications as identified in each stage above as the stages are transitioned.

3. The Licensee will directly notify the NCDWR, NCWRC, USFWS, USFS, and, if required, the TGA President and the AW representative when lake levels have been restored to within the Normal Operating Range with a normal generation schedule, normal minimum flows in the bypassed reaches and a normal schedule for Tainter gate releases to support whitewater boating.

4. The Licensee will update its website and telephone messages to account for the impacts of the above LIP on schedules for generation and bypass recreational releases and lake levels.

Hydro Project Maintenance & Emergency Protocol (HPMEP) for the West Fork and East Fork Projects

Introduction

Under some emergency and equipment failure and maintenance situations, certain license conditions may be impractical to meet or may need to be suspended or modified to avoid taking unnecessary risks. The purpose of this protocol is to define the most likely situations of this type for the East Fork Project (FERC # 2698) and the West Fork Project (FERC # 2686), 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.

Key Facts and Assumptions

1. Minimum Flows in Bypassed Stream Reaches – Assume the new license for the East Fork Project will include the following normal requirements for minimum releases from hydro project works into the Wolf Creek Bypassed Reach to enhance water quality and/or aquatic species habitat:

a. Wolf Creek Bypassed Reach – 6 cfs continuous release from a valve to be installed at Wolf Creek Dam.

2. Minimum Flows in the Tuckasegee River Main Stem – Assume that the new licenses

for the East Fork and West Fork projects will include the following minimum flow requirements for the main stem of the Tuckasegee River:

a. 30 cfs combined minimum flow from December 1 through June 30 (assuming inflow into Tuckasegee Lake is greater than or equal to 20 cfs) and provided by the same means as the existing provision:

1) Continue existing minimum flow at Tuckasegee (20 cfs or inflow, whichever is less).

2) Continue existing minimum flow at Cedar Cliff (10 cfs from a valve at the hydro station during non-generation hours only). When Cedar Cliff Powerhouse is generating, the minimum flow valve is turned off.

c. 55 cfs combined minimum flow from July 1 through November 30 (assuming inflow into Tuckasegee Lake is greater than or equal to 20 cfs) and provided by:

1) Continue existing minimum flow at Tuckasegee (20 cfs or inflow, whichever is less).

2) Increase the minimum flow valve capacity at Cedar Cliff and provide 35 cfs during non-generation hours only. When Cedar Cliff Powerhouse is generating, the minimum flow valve is turned off.

4. Generation Releases for Angling and Boating Recreation Flows – Assume the new licenses for the East Fork and West Fork projects will include the following Normal Generation Schedule to Support Recreation on the main stem of the Tuckasegee River from the Cedar Cliff and Thorpe / Tuckasegee Powerhouses, with all releases being at or above the Best Efficiency Flows for the subject hydro units:

a. **Primary Angling Periods**

1) Defined - The first weekend after Labor Day through the last weekend of October and April 1st through the first weekend of June are defined as primary angling periods with actual flows at or below about 500 cfs being preferred (as measured at the reactivated or replaced USGS gage at Dillsboro).

2) During part of this time period, boating release schedules overlap. During this overlap period (the Saturday that occurs nine days before Memorial Day through the first weekend of June and Saturdays in September and October), the Normal Generation Schedule to Support Recreation will be:
   a) West Fork Release: Saturday and Sunday one week prior to Memorial Day weekend, Saturday and Monday of Memorial Day weekend and three of four Saturdays in September and October, plus Tuesday, Friday and Saturday for the period between Memorial Day weekend through the first weekend in June, each for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.
   b) East Fork Release: Sunday of Memorial Day weekend plus Wednesday, Thursday and Sunday for the period between Memorial Day weekend through the first weekend in June and one of four Saturdays in September and October, each for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

b. **Primary Boating Periods**

1) Defined – The period after the first weekend of June through Labor Day is defined as the primary boating period, with actual flows at about 800 cfs (as measured at the reactivated or replaced USGS gage at Dillsboro) being preferred.
2) During this time period, the Normal Generation Schedule to Support Recreation for three out of four weeks will be:
   a) West Fork Release: Tuesday, Friday and Sunday for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

b) East Fork Release: Wednesday, Thursday and Saturday plus the Monday of Labor Day weekend for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

3) During this time period, the Normal Generation Schedule to Support Recreation for one out of four weeks will be:

a) West Fork Release: Tuesday, Friday and Saturday for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

b) East Fork Release: Wednesday, Thursday and Sunday for six hours per day, timed to arrive at the reactivated or replaced USGS gage at Dillsboro at approximately 10:30 AM.

c. **Adjusting for Significant Baseline Flows** – The Licensee will check the river flow daily at the reactivated Dillsboro USGS Gage #03510500 (or a suitable replacement gage in this vicinity as determined by USGS) and by doing so, the Licensee can project the expected river flow at the Dillsboro Gage during the next scheduled generation release to support recreation. When projected baseline river flow (i.e. the flow rate at the Dillsboro USGS gage without the Licensee making the scheduled generation release to support recreation) is expected to average more than 500 cfs over the period from 10:30 AM to 4:30 PM, specific recreation flow releases from the DPNA hydropower stations can be reduced or stopped.

d. **Other Special Events -** Other requests for special generation releases that require additional generation hours above the total number of hours in any given month in the Normal Generation Schedule to Support Recreation will be handled on a case-by-case basis. To the maximum practical extent, releases will be integrated with the normal release schedule so that additional release hours beyond the normal release schedule are not needed.

5. Bypass Flow Releases for Recreation – Assume the new license for the West Fork Project will include the following requirements for scheduled releases from Glenville Dam into the West Fork (Glenville) Bypassed Reach to enhance downstream recreation:

   d. Release water for six hours per day for one weekend (Saturday and Sunday) per calendar year in April. Target flowrate will be approximately 250 cfs each day and releases made to arrive at the put-in point at 10:00 AM.

   e. Provide five total weekend day releases per calendar year for six hrs each, scheduled on weekend days in the months of May through September. Target flowrate will be approximately 250 cfs each day and releases made to arrive at the put-in point at 10:00 AM.

   f. Target Flowrates - The target flowrates stated above are for flowrates at the put-in point. Actual release amounts from the Tainter gate need to be large enough that when combined with other tributary and accretion flows, the total is as close as possible to the target flowrates.

22. Normal Operating Range for Lake Levels – Assume the new licenses for the East Fork and West Fork projects will include the following requirements for Normal Operating Ranges of lake levels (Note: All lake levels are for the first day of the month. Levels for other days of the month can be determined by linear interpolation):

f. **Lake Glenville – Maintain the following Normal Operating Range:**

Month	Normal Minimum Elevation (feet)	Normal Target Elevation (feet)	Normal Maximum Elevation (feet)
Jan	85	90	94
Feb	85	90	94
Mar	88	91	94
Apr	90	93	96
May	95	97	99
Jun	95	97	99
Jul	95	97	99
Aug	93	95	98
Sep	90	93	94
Oct	90	93	94
Nov	86	90	94
Dec	85	90	94

g. **Tanasee Creek & Wolf Creek Lakes – Maintain the following Normal Operating Range:**

Month	Normal Minimum Elevation (feet)	Normal Target Elevation (feet)	Normal Maximum Elevation (feet)
Jan	83	85	92
Feb	83	85	92
Mar	83	85	92
Apr	86	88	96
May	90	93	100
Jun	90	93	100
Jul	90	93	100
Aug	90	93	100
Sep	90	93	100
Oct	90	93	100
Nov	86	88	96
Dec	83	85	92

h. **Bear Creek Lake – Maintain the following Normal Operating Range:**

Month	Normal Minimum Elevation (feet)	Normal Target Elevation (feet)	Normal Maximum Elevation (feet)
Jan	91	93	98
Feb	91	93	98
Mar	91	93	98
Apr	92	95	98
May	92	98	100
Jun	92	98	100
Jul	92	98	100
Aug	92	98	100
Sep	92	98	100
Oct	92	96	98
Nov	92	95	98
Dec	92	94	98

i. **Cedar Cliff Lake – Maintain the following Normal Operating Range:**

Month	Normal Minimum Elevation (feet)	Normal Target Elevation (feet)	Normal Maximum Elevation (feet)
Jan	96	98	100
Feb	96	98	100
Mar	96	98	100
Apr	96	98	100
May	96	98	100
Jun	96	98	100
Jul	96	98	100
Aug	96	98	100
Sep	96	98	100
Oct	96	98	100
Nov	96	98	100
Dec	96	98	100

j. **Tuckasegee Lake – Maintain lake level as needed to provide minimum flow.**

6. Most Likely Situations - the following table identifies the assumed most likely situations when this protocol will be enacted and the license conditions that would most likely be impacted:

Potentially Impacted License Conditions					
Situation	**Indications**	**Min. Flows in Bypassed Stream Reaches**	**Generation Releases for Recreation**	**Normal Operating Range for Lake Levels**	**Tainter Gate Releases for Recreation**
Hydro Unit Outage	Maintenance will require hydro unit shutdown.		X	X	
Outage of: Spill Valve Outage at Wolf Creek Dam, Spill Valve at Cedar Cliff Powerhouse, or Trash Sluice Gate at Tuckasegee Dam	Maintenance will require interruption of scheduled minimum releases from normal locations	X			
Outage of Tainter Gate at Glenville Dam	Maintenance will require rendering the Tainter gate inoperable.			X	X
Dam Safety Emergency	Condition A or B (i.e. dam failure has occurred, is imminent or a potentially hazardous situation exists) is declared per the Emergency Action Plan or other dam safety concern is identified.	X	X	X	X
Voltage or Capacity Emergency	Voltage or capacity conditions on the electric grid in the DPNA system or larger regional electric grid cause instability and electric system failure has occurred or is imminent.	X		X	X

7. Returning to Normal - All of the above situations can impact the Licensee's ability to operate the hydro projects in their 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 and provided that the repairs are economically justified and funds are available for the repairs.

8. Incidental Outages – outages of 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, outages of 48 hrs or less duration or that do not require deviation from any license conditions related to minimum flows in bypassed stream reaches or the main stem of the river, flow releases for whitewater recreation or the Normal Operating Ranges for lake levels are considered Incidental Outages and, except for the identified notifications for Incidental Outages that impact minimum flows, are exempt from the requirements of this protocol.

9. Notification Guidance
   a. *Planned Maintenance* - 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.
   b. *Unplanned Maintenance and Emergencies* - 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 stabilized.

10. Preparation for High Inflow Events – With modern forecasting, it is more possible than ever to see large precipitation events coming and to increase generation hours to reduce lake levels in order to mitigate the potential for spilling and downstream flooding. Typically, this type of advance action is taken from one to five days before

the expected arrival of the storm. It is assumed that the Normal Operating Ranges of lake levels will include adequate flexibility (i.e. band width) to allow for this type of lake level reduction. If the final Normal Operating Ranges for lake levels do not provide adequate flexibility, this protocol will be revised to account for the high inflow event preparation situation.

11. Relationship Between this Protocol and the Low Inflow Protocol – The Low Inflow Protocol (LIP) provides for reductions in generation flows, minimum flows and recreation flow releases in bypassed stream reaches and modification of the Normal Operating Ranges for lake levels when water demands on the lakes substantially exceed net inflow. Except for an outage of one of the normal means of providing minimum flows or a stuck-open Tainter gate on a dam, lowering lake levels caused by situations addressed under this Hydro Project Maintenance & Emergency Protocol (HPMEP) will not invoke implementation of the LIP. Also, if the LIP has already been implemented at the time that a situation covered by this HPMEP is initiated, the Licensee will typically suspend implementation of the LIP until the HPMEP situation has been eliminated. The Licensee may however choose to continue with the LIP if desirable.

12. Peak Recreation Season – 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 through October.

13. Critical Commercial Whitewater Recreation Periods – the portions of the Peak Recreation Season that have the highest impact on the commercial whitewater industry that depends on these hydro projects. Loss of whitewater recreation flows for the duration of any of these periods could damage the stability of the whitewater recreation businesses that serve the area. For the purposes of this protocol, these

periods are defined as any period of six or more consecutive scheduled whitewater releases as noted in the Primary Boating Periods section above.

14. Critical Flow Period for Stream Fish – the portion of the year when fish in the streams affected by the hydro projects most need minimum flows or can be most impacted by higher temperature water releases from the Tainter gates. For the purposes of this protocol, the Critical Flow Period for Stream Fish is defined as July 1 through November 30.

15. Threshold Minimum Flows – the minimum flow release amounts from hydro project works that may be necessary to sustain aquatic communities consistent with the resource management goals and objectives for the affected stream reaches. Since the normal minimum flow releases are for water quality and / or aquatic species habitat enhancements, the Threshold Minimum Flows are related to and lower than the normal minimum flow releases required by the FERC license. For the purposes of this protocol, it is assumed that the Threshold Minimum Flows are as follows:
    c. Wolf Creek Bypassed Reach - 2 cfs or inflow into Wolf Creek Lake, whichever is less, released from Wolf Creek Dam into the Wolf Creek Bypassed Reach.
    d. Main Stem of the Tuckasegee River – the normal minimum flow provided from Tuckasegee Dam (i.e. 20 cfs or inflow into Tuckasegee Lake, whichever is less) plus the following minimum flows provided from the Cedar Cliff Spill Valve during periods of non-generation from Cedar Cliff Hydro Station:
        1) From December 1 through June 30 – 6 cfs
        2) From July 1 through November 30 – 11 cfs.

16. Organizational abbreviations include the NC Division of Water Resources (NCDWR), NC Wildlife Resources Commission (NCWRC), United States Forest Service

(USFS), United States Fish & Wildlife Service (USFWS), NC State Historic Preservation Office (NCSHPO), the Eastern Band of Cherokee Indians (EBCI), the Tuckasegee Gorge Association (TGA), United States Geological Survey (USGS) and the American Whitewater Affiliation (AW).

17. Voltage and Capacity Emergencies – The electric transmission system serving the project area is the Duke Power-Nantahala Area (DPNA) system. The DPNA system is connected to the larger regional electric grid by: (a) Santeetlah 161 kV line connecting to the Tennessee Valley Authority (TVA) system and (b) two, 230 kV lines connecting to the Duke Power system near Lake Jocassee. If any one of these three electric transmission lines fails or if a major interruption within the DPNA system occurs, the entire DPNA system can become unstable due to inadequate capacity or voltage to support system demands. The result can include brown-outs or black-outs of large blocks of electric customers served by the DPNA system. Also, since the Licensee's hydro stations are the only electric generation sources that are directly tied to the DPNA system and they do not produce enough electric capacity to meet the DPNA system's instantaneous load, transmission system failures and overloads on the larger regional electric grid can also cause brown-outs and black-outs within the DPNA system. Therefore, for the purposes of this protocol, a voltage or capacity emergency shall exist when any of the following occur:
    a. The Santeetlah 161 kV line connecting the DPNA system to the TVA system is out of service
    b. Either of the two 230 kV lines connecting the DPNA system to the Duke Power system is out of service
    c. The DPNA system has been split by an internal system failure
    d. A voltage or capacity emergency is declared by Duke's System Operating Center (SOC) or Transmission Operating Center (TOC).

18. Safety and Electric System Integrity 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 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.

General Approach to Abnormal Situations

A. Hydro Unit Outages

1. Mitigating Actions

a. *Planned Unit Outages*

1) Scheduling - To the extent practical, the Licensee will avoid scheduling unit outages during the Peak Recreation Season (which also includes the Critical Commercial Whitewater Recreation Periods) and the Critical Flow Period for Stream Fish, unless it is likely that the equipment condition will cause a forced unit outage if repairs are delayed.

2) Replacing Generation Recreation Releases – If the outage cannot avoid the Critical Commercial Whitewater Recreation Periods, then the Licensee will endeavor in good faith to replace a portion of the missed generation flows that are normally scheduled for recreation. This can be accomplished by providing the normally scheduled release except by providing it from the other, non-outage hydro project (e.g. if Cedar Cliff Hydro was out of service, then the West Fork hydros could provide the scheduled release). If both the Cedar Cliff and the West Fork hydros are out of service simultaneously, then the Licensee will consider providing at least some releases from the Tainter gate at Cedar Cliff Hydro to replace the missed generation releases for recreation. Providing replacement releases from a Tainter gate at Glenville Dam would only be an option if one of the normally scheduled releases at Glenville Dam for whitewater recreation in the West Fork (Glenville) Bypassed Reach is occurring or if a Tainter gate release is needed anyway to control the level of Lake Glenville. If replacement releases will be provided from a Tainter gate at any of the dams and the water temperature in the subject lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will:

a) Avoid scheduling replacement releases for more than two consecutive days.

b) Monitor temperatures and dissolved oxygen (DO) levels in any affected bypassed stream reach during the Tainter gate release.

c) Stop the releases if DO levels drop below 5 mg/l (i.e. the instantaneous minimum DO level specified by the NC State Water Quality Standards for trout waters) or if stressed or dead fish are observed.

d) Replace any aquatic species mortalities that are identified.

3) Drawing Down the Affected Lake – To minimize the impacts to its electric customers, the Licensee may choose to draw down a lake using its hydro unit to a point where spillage from the dam is expected to be minimized during the outage.

b. *Forced Unit Outages*

1) Replacing Generation Recreation Releases – If the outage impacts generation releases scheduled for recreation during the Critical Commercial Whitewater Recreation Periods, then the Licensee will endeavor in good faith to replace a portion of the missed generation flows that are normally scheduled for recreation. This can be accomplished by providing the normally scheduled release except by providing it from the other, non-outage hydro project (e.g. if Cedar Cliff Hydro was out of service, then the West Fork hydros could provide the scheduled release). If both the Cedar Cliff and the West Fork hydros are out of service simultaneously, then the Licensee will consider providing at least some releases from the Tainter gate at Cedar Cliff Hydro to replace the missed generation releases for recreation. Providing replacement releases from a Tainter gate at Glenville Dam would only be an option if one of the normally scheduled releases at Glenville Dam for whitewater recreation in the West Fork (Glenville) Bypassed Reach is occurring or if a Tainter gate release is needed anyway to control the level of Lake Glenville. If replacement releases will be provided from a Tainter gate at any of the dams and the water

temperature in the subject lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will:

a) Avoid scheduling replacement releases for more than two consecutive days.
b) Monitor temperatures and dissolved oxygen (DO) levels in any affected bypassed stream reach during the Tainter gate release.
c) Stop the releases if DO levels drop below 5 mg/l (i.e. the instantaneous minimum DO level specified by the NC State Water Quality Standards for trout waters) or if stressed or dead fish are observed.
d) Replace any aquatic species mortalities that are identified.

2. Communication with Resource Agencies and Affected Parties

a. *Planned Unit Outages*

1) Direct Consultation - The Licensee will consult with the NCDWR, USFWS and the NCWRC as soon as approximate schedule dates are determined, but at least 10 days prior to beginning any lake draw down or the unit outage (if a drawdown of the lake will not be performed). Add the TGA President and AW if the outage will affect the Normal Generation Schedule to Support Recreation as noted above. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental, cultural and human needs relative to the hydro project.
2) General Notification – At least 10 days before beginning any lake draw down or the unit outage (if a drawdown of the lake will not be performed), the Licensee will add the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the outage and draw down schedule.

b. *Forced Unit Outages*

1) Direct Notification - The Licensee will notify the NCDWR, USFWS and the NCWRC as soon as possible after the forced outage begins, but no longer than

five days afterwards. Add the TGA President and AW if the outage will affect the Normal Generation Schedule to Support Recreation as noted above.

2) General Notification – As soon as possible after the forced outage occurs but no longer than five days afterwards, the Licensee will add the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the outage and draw down schedule.

3) Direct Consultation – The Licensee will consult with the NCDWR, USFWS and the NCWRC as soon as possible after the forced outage begins, but no longer than 10 days afterwards. Add the TGA President and AW if the outage will affect the Normal Generation Schedule to Support Recreation as noted above. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental, cultural and human needs relative to the hydro project.

B. Outages of the Normal Means of Providing Minimum Flows

1. Mitigating Actions

a. *Planned Outages*

1) Scheduling - To the extent practical, the Licensee will avoid scheduling outages during the Critical Flow Period for Stream Fish, unless it is likely that the equipment condition will cause a forced outage if repairs are delayed.

2) Replacing Lost Minimum Flows - If the outage cannot avoid impacting minimum flows during the Critical Flow Period for Stream Fish, then the Licensee will endeavor in good faith to replace a portion of the missed minimum flows in the affected stream reaches. This can be accomplished by partially opening the Tainter gate at Wolf Creek Dam (if the outage will be for spill valve repairs at Wolf Creek Dam ----note that this is probably only a temporary replacement means, because repair of the valve will likely require drawdown of the lake below the Tainter gate sill), partially opening the Tainter

gate at Cedar Cliff Dam or utilizing the larger, hand-controlled flashboard at Tuckasegee Dam. (Note: If minimum flows below Cedar Cliff are to be supplemented by partially opening a Tainter gate at Cedar Cliff Dam and the water temperature in Cedar Cliff Lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will complete the Direct Notification of resource agencies identified in item B.2.b below before partially opening a Tainter gate).

3) Avoid Falling Below the Threshold Minimum Flows – To the extent practical, the Licensee will avoid falling below any of the Threshold Minimum Flows as noted above. If it is determined that 100% exceedance of the Threshold Minimum 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.

b. Forced Outages

1) Replacing Lost Minimum Flows - If the outage cannot avoid impacting minimum flows during the Critical Flow Period for Stream Fish, then the Licensee will endeavor in good faith to replace a portion of the missed minimum flows in the affected stream reaches. This can be accomplished by partially opening the Tainter gate at Wolf Creek Dam (if the outage will be for spill valve repairs at Wolf Creek Dam ----note that this is probably only a temporary replacement means, because repair of the valve will likely require drawdown of the lake below the Tainter gate sill), partially opening the Tainter gate at Cedar Cliff Dam or utilizing the larger, hand-controlled flashboard at Tuckasegee Dam. (Note: If minimum flows below Cedar Cliff are to be supplemented by partially opening a Tainter gate at Cedar Cliff Dam and the water temperature in Cedar Cliff Lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will complete the Direct Notification of

resource agencies identified in item B.2.b below before partially opening a Tainter gate).

2) Avoid Falling Below the Threshold Minimum Flows – To the extent practical, the Licensee will avoid falling below any of the Threshold Minimum Flows as noted above. If it is determined that 100% exceedance of the Threshold Minimum 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.

2. Communication with Resource Agencies and Affected Parties

a. *Planned Outages*

1) Direct Consultation – The Licensee will consult with the NCDWR, USFWS and the NCWRC as soon as approximate schedule dates are determined, but at least 10 days prior to beginning the outage. Add the USFS if the outage will affect the spill valve at Wolf Creek Dam. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental and human needs relative to the hydro project. (Note that this communication with resource agencies is also required for Incidental Outages (see definitions) that impact minimum flows).

b. *Forced Outages*

1) Direct Notification - The Licensee will notify the NCDWR, USFWS and the NCWRC as soon as possible after the forced outage begins, but no longer than five days afterwards. Add the USFS if the outage will affect the spill valve at Wolf Creek Dam. (Note that this communication with resource agencies is also required for Incidental Outages (see definitions) that impact minimum flows). If minimum flows below Cedar Cliff are to be supplemented by partially opening a Tainter gate at Cedar Cliff Dam and the water temperature in Cedar

Cliff Lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will include the following information in the Direct Notification:

a) The actual measured lake temperature at the depth corresponding to the Tainter gate sill

b) The approximate total average daily flow in the East Fork of the Tuckasegee River just upstream of its confluence with the West Fork of the Tuckasegee River

c) The targeted amount of the Tainter gate release.

2) *Direct Consultation* – The Licensee will consult with the NCDWR, USFWS and the NCWRC as soon as possible after the forced outage begins, but no longer than 10 days afterwards. Add the USFS if the outage will affect the spill valve at Wolf Creek Dam. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental and human needs relative to the hydro project.

C. Tainter Gate Outages

1. Mitigating Actions

a. Planned Outages

1) Scheduling – To the extent practical, the Licensee will avoid scheduling outages of the Tainter gate at Glenville Dam that conflict with dates scheduled for Tainter gate releases for whitewater boating in the West Fork (Glenville) Bypassed Reach, unless it is likely that the equipment condition will cause a forced outage if repairs are delayed.

2) Replacing Lost Whitewater Releases from the Tainter Gate – If the outage cannot avoid a loss of scheduled whitewater releases from the Tainter gate at Glenville Dam, then the Licensee will endeavor in good faith to reschedule the releases from the Tainter gate during the current Peak Recreation Season at

Glenville Dam to replace the missed releases that are normally scheduled for recreation.

3) Drawing Down the Affected Lake – To minimize the impacts to its electric customers as well as to minimize the risk of performing the work, the Licensee may choose to draw down the affected lake using the hydro unit to a point where spillage from the dam is expected to be minimized during the outage.

b. Forced Outages

1) Replacing Lost Whitewater Releases from the Tainter Gate – If the outage will cause a loss of scheduled whitewater releases from the Tainter gate at Glenville Dam, then the Licensee will endeavor in good faith to reschedule the releases from the Tainter gate during the current Peak Recreation Season at Glenville Dam to replace the missed releases that are normally scheduled for recreation. (Note: If the rescheduled releases will occur during the Critical Flow Period for Stream Fish and the water temperature in Lake Glenville at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will complete the Direct Notification of resource agencies identified in item C.2.b below before making the rescheduled Tainter gate release).

2) Drawing Down the Affected Lake – To minimize the impacts to its electric customers as well as to minimize the risk of performing the work, the Licensee may choose to draw down the affected lake using the hydro unit to a point where spillage from the dam is expected to be minimized during the outage.

2. Communication with Resource Agencies and Affected Parties

a. Planned Outages

1) Direct Consultation - If the outage will impact scheduled releases from the Tainter gates for whitewater boating in the West Fork (Glenville) Bypassed Reach, the Licensee will consult with the NCDWR, NCWRC, USFWS, the President of the TGA and AW as soon as approximate schedule dates are

determined, but at least 10 days prior to beginning the outage. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental, cultural and human needs relative to the hydro project.

2) General Notification – At least 10 days before beginning an outage that will cause a loss of scheduled whitewater releases from the Tainter gate, the Licensee will add the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the outage and any rescheduled Tainter gate releases for whitewater recreation.

b. Forced Outages

1) Direct Notification - If the outage will impact scheduled releases from the Tainter gate for whitewater boating in the West Fork (Glenville) Bypassed Reach, the Licensee will notify the NCDWR, USFWS, NCWRC, the TGA President and AW as soon as possible after the forced outage begins, but no longer than five days afterwards. If the rescheduled Tainter gate releases will occur during the Critical Flow Period for Stream Fish and the water temperature in Lake Glenville at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will include the following information in the Direct Notification:

   a) The actual measured lake temperature at the depth corresponding to the Tainter gate sill
   b) The approximate total average daily flow in the West Fork (Glenville) Bypassed Reach just upstream of its confluence with Tuckasegee Lake
   c) The targeted amount (cfs), duration (hrs per day) and number of rescheduled days of the Tainter gate release.

2) General Notification – If the outage will impact scheduled releases from the Tainter gate for whitewater boating in the West Fork (Glenville) Bypassed Reach, within five days following the start of the outage, the Licensee will add

the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the outage and any rescheduled Tainter gate releases for whitewater recreation.

3) Direct Consultation - If the outage will impact scheduled releases from the Tainter gate for whitewater boating in the West Fork (Glenville) Bypassed Reach, the Licensee will consult with the NCDWR, NCWRC, USFWS, the President of the TGA and AW as soon as possible after the outage occurs, but no longer than 10 days afterwards. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental, cultural and human needs relative to the hydro project.

D. Dam Safety Emergency

1. Mitigating Actions

a. *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.

2. Communication with Resource Agencies and Affected Parties

a. *Direct Notification* – 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.

b. *Once Dam Safety Conditions Have Stabilized* – The Licensee will add the appropriate messages to its public information website and/or its lake level phone

system to inform the general public of the situation and any expected return to normal operation.

E. Voltage and Capacity Emergencies

1. Mitigating Actions

a. *Suspension of the Normal Operating Range for Lake Levels* – If a voltage or capacity emergency (as defined above) occurs, the Licensee may modify or suspend lake 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.

b. *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 Threshold Minimum Flows (as defined above) and may modify or suspend any scheduled Tainter gate releases to support whitewater recreation in the West Fork (Glenville) Bypassed Reach if taking those actions is necessary to maintain the water inventory in project reservoirs.

c. *Replacing Lost Whitewater Releases from the Tainter Gate* – If scheduled whitewater releases from the Tainter gate at Glenville Dam are lost, then once the emergency is over, the Licensee will endeavor in good faith to reschedule the releases from the Tainter gate during the current Peak Recreation Season at Glenville Dam to replace the missed releases that are normally scheduled for recreation.

2. Communication with Resource Agencies and Affected Parties

a. *Direct Notification* - The Licensee will notify the NCDWR, USFWS and the NCWRC as soon as possible following a deviation from license conditions for voltage or capacity emergency reasons (add the TGA President and AW if Tainter

gate releases for recreational purposes are impacted) (add the USFS if lake levels at Wolf Creek Lake or Tanasee Creek Lake or minimum flows from Wolf Creek Dam are affected), but no longer than five days afterwards.

b. *General Notification* - Within five days following the start of the emergency deviation, the Licensee will add the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the situation and any expected dates for return to normal operations.

Direct Consultation – The Licensee will consult with the NCDWR, USFWS and the NCWRC as soon as possible following a deviation from license conditions for voltage or capacity emergency reasons (add the TGA President and AW if Tainter gate releases for recreational purposes are impacted) (add the USFS if lake levels at Wolf Creek Lake or Tanasee Creek Lake or minimum flows from Wolf Creek Dam are affected), but no longer than 10 days following such deviation. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the emergency on the environmental, cultural and human needs relative to the hydro project.

Document Content(s)